INTERNATIONAL JOURNAL of Industrial Education and Technology

THE DEVELOPMENT OF A CURRICULUM AND CARTOON-BASED LEARNING MODULES FOR AN ADDITIONAL COURSE: MUEANG FA DAET SONG YANG AND PHRA THAT YAKHU TO PROMOTE 21ST-CENTURY CAREER SKILLS FOR GRADE 7 STUDENTS

Jirati Chatpangta*
jirati.teacher@gmail.com*
Senior Professional Level Teacher, Kamalasai School, Kamalasai District,
Kalasin Province 46130 Thailand

*Corresponding author E-mail: jirati.teacher@gmail.com

Received: November 17, 2025 **Revised:** December 16, 2025 **Accepted:** December 25, 2025

Citation reference :
Chatpangta J. (2025) The development of a curriculum and cartoon-based learning modules for an additional course: "mueang fa daet song yang and phra that ya khu" to promote 21st century career skills for grade 7 students. **International Journal of Industrial Education and Technology, 7** (2), 103 - 113.

ABSTRACT

This research aimed to develop and implement a curriculum and a set of cartoon-based learning modules for the supplementary course *"Mueang Fa Daet Song Yang and Phra That Yakhu"* to promote 21st-century career skills among Grade 7 students at Kamalasai School, Kalasin Province. The study employed a research and development (R&D) methodology comprising four stages: basic information analysis, curriculum and learning material development, field implementation, and evaluation. The research instruments included the developed curriculum, nine cartoon-based learning booklets, lesson plans, assessment forms, and a student satisfaction questionnaire. Content validity was examined by five experts using the Index of Item-Objective Congruence (IOC). The instructional materials achieved efficiency values exceeding the established criterion of 80/80 (E_1/E_2 = 83.54/81.43). The results indicated that students' post-test achievement scores were significantly higher than their pre-test scores, with 100% of the students meeting the learning criteria. In addition, students demonstrated marked improvement in analytical thinking, collaboration, and technology use, reflecting the development of key 21st-century career skills. Students' overall satisfaction with the learning modules was rated at the highest level across all aspects, particularly content, learning activities, and media design. These findings suggest that cartoon-based learning effectively enhances active learning, engagement, and skill development while integrating local wisdom and community identity. The developed curriculum and learning modules therefore have strong potential as a model for promoting 21st-century career skills through innovative and contextually relevant educational practices.

Keywords: Curriculum development, Cartoon-based learning modules, Mueang Fa Daet Song Yang, Phra That Yakhu, 21st century career skills

I. INTRODUCTION

Education in the 21st century emphasizes the cultivation of essential career skills that enable learners to adapt to rapid technological, social, and economic change. These core competencies creativity, collaboration, communication, and critical thinking are vital for preparing youth to participate effectively in an increasingly competitive world (Buason, 2019, pp. 1–11). In Thailand, contemporary educational policies and competency-based education reforms increasingly emphasize learner-centered instruction, innovation, and the integration of real-world contexts to enhance problem-solving abilities and career readiness. At the same time, integrating local wisdom and community identity into school curricula has been recognized as an important approach to promoting sustainable learning and strengthening cultural appreciation (Boonapai et al., 2008, p. 17).

A number of studies have explored instructional innovation and curriculum design that promote 21st-century learning skills. Bunnak (2023, pp. 25–60) developed an art-learning module based on postmodern art concepts, which enhanced students' creativity and metacognitive abilities. Likewise, Phosue (2020, pp. 10–25) designed a curriculum to improve secondary-school teachers' learning-management competencies for the digital era. These studies demonstrate that integrating modern teaching methods and engaging media can improve learners' motivation and achievement. However, research that systematically integrates local cultural and historical contexts with the development of 21st-century career skills particularly through cartoon-based learning modules remains limited.

This study was grounded in the curriculum-development frameworks proposed by Tyler (1949, pp. 1–3) and Taba (1962, pp. 12–13), which emphasize defining educational objectives, selecting and organizing learning experiences, and evaluating learning outcomes. Sayler and Alexander (1974, pp. 45–46) also stressed that effective curricula should bridge theoretical principles with practical classroom applications. Building on these frameworks, the present study integrates local wisdom as a meaningful learning context that supports both cultural understanding and the development of 21st-century career skills. Mueang Fa Daet Song Yang and Phra That Yakhu are significant cultural and historical heritage sites in Kalasin Province, representing community identity, traditional knowledge, and local artistic expression. These sites provide authentic learning resources that can enhance students' engagement and understanding by connecting academic content with familiar real-life contexts.

Therefore, this study aimed to develop and implement a supplementary curriculum and cartoon-based learning modules for Grade 7 students at Kamalasai School, Kalasin Province, integrating local cultural heritage with innovative instructional media. Through this approach, students were expected to enhance 21st-century career skills, including analytical thinking, collaboration, creativity, and technology use, while simultaneously cultivating appreciation for local culture and community identity.

II. LITERATURE REVIEW

Curriculum development is a systematic process of planning, designing, implementing, and evaluating learning experiences based on educational goals and learners' needs. According to Tyler (1949, pp. 1-3), curriculum development involves defining objectives, selecting learning experiences, organizing content, and evaluating outcomes. Similarly, Taba (1962, pp. 12-13) proposed a grassroots approach emphasizing teachers' roles in designing learning experiences. Sayler and Alexander (1974, pp. 45–46) suggested that effective curricula should integrate theory with practice to promote meaningful learning. In the context of Thailand, (Buason, 2019, pp. 1–11) highlighted that 21st-century curriculum design should focus on innovation, creativity, and problem-solving to prepare learners for future challenges. These curriculum development theories emphasize the systematic alignment of objectives, learning activities, and evaluation processes to support learners' skill development in contemporary educational contexts.

Previous studies have demonstrated various approaches to developing curricula and instructional materials aimed at enhancing learning effectiveness. Bunnak (2023, pp. 25-60) developed an art learning module based on postmodern art concepts that improved students' creativity and metacognitive skills, while (Phosue, 2020, pp.10–25) designed a digital learning management curriculum to enhance teachers' professional competencies. These studies indicate that curriculum development supported by creative and innovative instructional approaches can positively influence learners' cognitive and metacognitive outcomes. In addition, the use of visual and media-based instructional materials has been recognized as an effective approach to enhancing learner engagement and understanding. (Raiyn, 2016, pp. 115-121) Furthermore, curriculum development that incorporates local contexts and learning environments can enhance the relevance of learning experiences. Local wisdom and cultural heritage can function as meaningful learning resources that help learners connect academic knowledge with real-life experiences and community identity (Boonapai et al., 2008, p. 17). When local cultural content is systematically integrated into curriculum design, it can support learner engagement and provide authentic contexts for developing essential skills. (Pewewardy, 2002, pp.22–56) Therefore, this study was based on the conceptual framework of Tyler (1949, pp. 1–3) and Taba (1962, pp. 12–13), focusing on curriculum development principles and the integration of local wisdom within a structured curriculum model to create a relevant learning model for Grade 7 students.

III. RESEARCH METHODOLOGY

The research instruments included a supplementary curriculum, cartoon-based learning modules, a curriculum and lesson evaluation form, a 21st-century career skills assessment form, and a student satisfaction questionnaire. The supplementary curriculum and cartoon-based learning modules were designed and developed by the researcher. The modules consisted of nine cartoon booklets presenting content related to the history, culture, and local learning resources of Mueang Fa Daet Song Yang, aiming to promote students' engagement and understanding through visual storytelling.

The curriculum and lesson evaluation form was used by five experts to assess the appropriateness of the content, format, and media of the developed materials. The 21st-century career skills assessment form was employed to measure students' analytical thinking, collaboration, technology use, and self-directed learning before and after the instructional implementation. In addition, the student satisfaction questionnaire was used to evaluate learners' opinions and levels of satisfaction toward the cartoon-based learning modules.

All research instruments were constructed by the researcher based on relevant educational theories and the results of a needs analysis. The instruments were reviewed by five experts in curriculum and instructional design to examine content validity using the Index of Item-Objective Congruence (IOC)**.** Items with IOC values of 0.50 or higher were accepted, while those scoring below the criterion were revised or removed. The 21st-century career skills assessment form and the satisfaction questionnaire were piloted with a sample group similar to the actual participants. Their reliability was examined using Cronbach's Alpha Coefficient**,** which yielded reliability values of $\alpha \geq 0.80$, indicating satisfactory internal consistency.

The data collection process was conducted in three phases**.** In **the** pre-experimental phase**,** students' 21st-century career skills were assessed using the pre-test version of the assessment form**.** During the experimental phase, instructional implementation was carried out using the nine cartoon-based learning booklets following the sequence of learning units specified in the developed curriculum**.** In the post-experimental phase, students' learning achievement and 21st-century career skills were reassessed and compared with the pre-test results**.** Additional data were collected through the student satisfaction questionnaire, teacher interviews, and open-ended feedback to obtain in-depth insights into students' learning outcomes and the effectiveness of the instructional implementation. Throughout the research process, the researcher observed students' learning behaviors, recorded field notes, and analyzed qualitative data to support the improvement of the learning materials for future use.

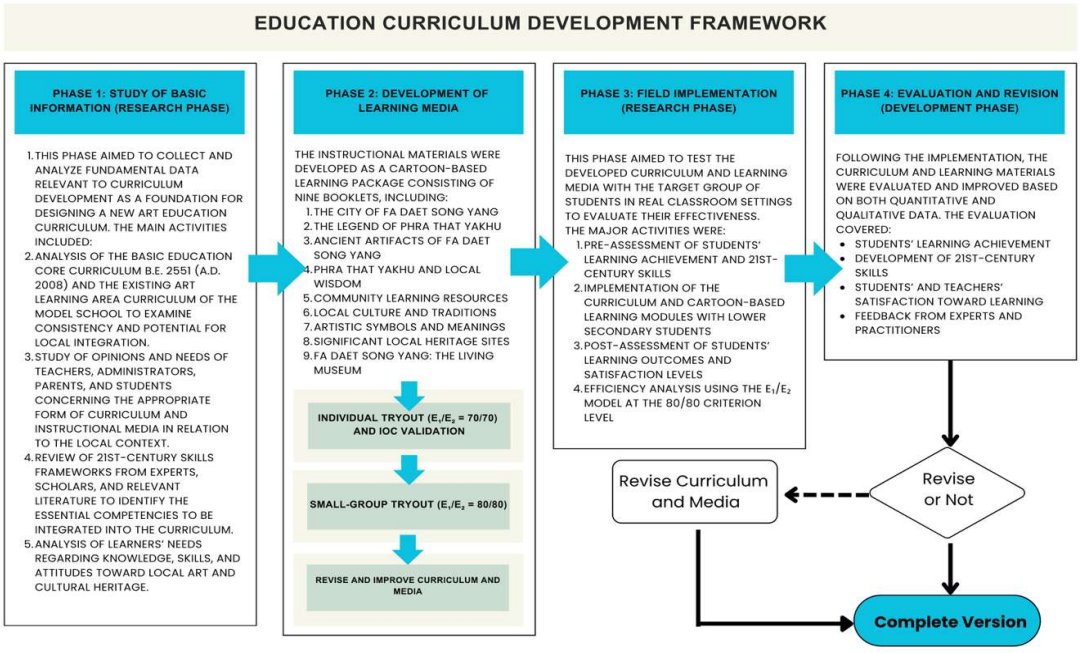

Figure 1: Conceptual Framework of the Research

IV. DATA ANALYSIS

The data obtained from this study were analyzed using both quantitative and qualitative methods to comprehensively evaluate the effectiveness of the developed curriculum and cartoon-based learning modules.

Quantitative data were analyzed using descriptive statistics, including mean, percentage, and standard deviation. Students' learning achievement and 21st-century career skills were analyzed by comparing pre-test and post-test scores to determine learning effectiveness after the instructional implementation. In addition, the efficiency of the developed curriculum and cartoon-based learning modules was evaluated using the E_1/E_2 efficiency criteria**,** with the standard criterion set at 80/80**.**

Qualitative data were collected from student satisfaction questionnaires, teacher interviews, open-ended feedback, and classroom observations. These data were analyzed using content analysis to identify common themes related to students' learning behaviors, engagement, and perceptions toward the instructional activities. Field notes recorded during the instructional process were also examined to support the interpretation of quantitative results and to provide additional insights for improving the learning materials.

V. RESULTS

The study on the development of a supplementary curriculum and cartoon-based learning modules entitled "Mueang Fa Daet Song Yang and Phra That Yakhu" aimed to promote 21st-century the 21st-century career skills among Grade 7 students. The results of data analysis and curriculum development are presented descriptively and in tabular form, and are summarized in four main stages as follows.

Stage 1: Results of Curriculum and Cartoon-Based Learning Module Development

The results of the curriculum and cartoon-based learning module development were derived from the analysis of basic information and were used as guidelines for designing the supplementary curriculum and instructional materials. The findings revealed a shared consensus among administrators, teachers, parents, and students that cartoon media should be used as the primary instructional tool to promote enjoyable, engaging, and easily comprehensible learning experiences while fostering local knowledge and 21st-century career skills.

The supplementary curriculum and the cartoon-based learning modules entitled *"Mueang Fa Daet Song Yang and Phra That Yakhu"* were developed through a systematic process consisting of curriculum design, content development, expert validation, and preliminary efficiency testing. The results of this stage are presented as follows.

1.1 Results of Curriculum and Learning Module Quality Evaluation The researcher developed the curriculum framework, nine cartoon-based learning booklets, and lesson plans based on the objectives of the supplementary course. These materials were submitted to five experts for quality evaluation, including a curriculum and instruction specialist, a cultural arts specialist, an educational technology expert, an experienced art teacher, and a curriculum development supervisor.

The evaluation results indicated that all components of the curriculum and cartoon-based learning modules achieved an Index of Item-Objective Congruence (IOC) value of 1.00. This finding demonstrates that the developed curriculum and instructional materials were accurate, comprehensive, and appropriate in terms of content, structure, and instructional media, and were suitable for implementation in actual educational settings.

1.2 Results of Preliminary Efficiency Testing (E1/E2)

After revising the curriculum and learning modules according to the experts' suggestions, the researcher conducted a preliminary efficiency test using individual and group tryouts. The purpose of this testing was to determine the initial effectiveness of the cartoon-based learning modules prior to field implementation. The results of the preliminary efficiency test are presented in Table 1

Table 1 : Results of the Preliminary Efficiency Test of the Cartoon-Based Learning Modules (E_1/E_2)

Type of Tryout	Number of Students	Full Score	Mean	SD	Efficiency (%)
Individual Tryout (E_1)	3	60	43.67	5.03	72.78
Individual Tryout (E_2)	3	40	28.67	5.69	71.67
Group Tryout (E_1)	9	60	43.89	4.96	73.15
Group Tryout (E_2)	9	40	33.22	2.77	83.06

The findings showed that the individual tryout achieved efficiency values of 72.78/71.67, while the group tryout achieved efficiency values of 73.15/83.06**.** When compared with the established criterion of 70/70 for preliminary efficiency testing, both tryouts exceeded the standard.

These results indicate that the cartoon-based learning modules demonstrated satisfactory process efficiency (E_1) and learning outcome efficiency (E_2), and were therefore considered appropriate for use in the field tryout stage.

1.3 Analysis of the Lesson Plans

The lesson plans integrated within the cartoon-based learning modules were also evaluated by the experts. The results showed that the lesson plans were consistent with the stated objectives, learning activities, and expected learning outcomes in all aspects.

The experts suggested only minor revisions, primarily focusing on increasing the variety of learning activities and ensuring that the activities were suitable for the developmental level of Grade 7 students. After incorporating these suggestions, the lesson plans were considered ready for implementation.

Stage 2: Results of the Field Tryout

After the curriculum and the cartoon-based learning modules were reviewed and revised according to the experts' recommendations, the researcher conducted a field tryout with 40 Grade 7 students from Kamalasai School. The instructional implementation was carried out in accordance with the lesson schedule specified in the developed curriculum.

2.1 Results of the Efficiency of the Learning Modules (E_1/E_2)

The results of the field tryout are presented in Table 2

Table 2 : Results of the Field Tryout Efficiency Test of the Cartoon-Based Learning Modules (E_1/E_2)

Type of Tryout	Number of Students	E1 (%)	E2 (%)
Field Tryout	40	83.54	81.43

The analysis of the learning module efficiency, based on the field implementation with 40 Grade 7 students**,** revealed the following results:

1. The E_1 value was 83.54**,** indicating that during the learning process, students correctly completed 83.54% of the learning activities and exercises**.**

2. The E_2 value was 81.43, meaning that after the instruction, students correctly answered 81.43% of the achievement test items.

When compared with the standard criterion of 80/80, it was found that both efficiency values were higher than the established standard, demonstrating that the cartoon-based learning modules were of excellent quality, capable of promoting effective and sustainable learning outcomes, and suitable for practical use in school settings.

2.2 Learning Achievement Before and After Instruction

The analysis of the pre-test and post-test results showed that students' learning achievement after instruction was higher than before instruction, with a statistically significant difference. Moreover, all students (100%) met the achievement criteria, indicating a substantial improvement in learning performance following the implementation of the curriculum and learning modules.

2.3 Students' Satisfaction

Data collected on students' satisfaction toward the cartoon-based learning modules revealed that their overall satisfaction level was at the "highest" level across all evaluated aspects, including learning media, content, learning activities, and teachers' instructional methods.

Summary of Field Tryout Findings

The field implementation of the curriculum and cartoon-based learning modules with Grade 7 students at Kamalasai School demonstrated that:

1. The learning modules achieved efficiency values higher than the 80/80 standard (E_1/E_2 = 83.54/81.43 > 80/80).
2. Students' post-test learning achievement was higher than their pre-test results, and all students (100%) met the passing criteria.
3. Students expressed the highest level of satisfaction toward the learning modules.

These results confirm that the cartoon-based learning modules were of high quality and suitable for real classroom use. Furthermore, they have the potential to serve as a model for developing learning media for other supplementary subjects in the future.

Stage 3: Results of the Curriculum Evaluation and Improvement

After completing the field implementation of the curriculum and the cartoon-based learning modules, the researcher conducted an evaluation covering three main aspects: (1) students' learning achievement, (2) 21st-century career skills, and (3) students' opinions and satisfaction toward the learning experience. The evaluation results were subsequently used to revise and improve the curriculum and learning modules for future application.

3.1 Learning Achievement

The analysis of pre-test and post-test scores from 40 Grade 7 students revealed that the mean post-test score was significantly higher than the pre-test score. Moreover, all students (100%) met the passing criteria, indicating that the curriculum and cartoon-based learning modules effectively enhanced students' learning achievement.

Table 3 : Comparison of Students' Learning Achievement Before and After Instruction

Test	N	Mean ($\bar{x}$)	Percentage Meeting the Criterion
Before Learning	40	Below the criterion	–
After Learning	40	Above the criterion	100%

Table 3 shows that the post-test learning achievement of the 40 Grade 7 students at Kamalasai School was significantly higher than their pre-test achievement, indicating a statistically significant improvement in learning outcomes. Importantly, all students (100%) met the required performance criteria, demonstrating that the cartoon-based learning modules were of high quality and had a positive effect on enhancing students' academic achievement.

3.2 Evaluation of 21st-Century Career Skills

The evaluation of 21st-century career skills among the Grade 7 students after implementing the curriculum and cartoon-based learning modules revealed that students demonstrated notable improvement in all assessed skill areas compared with their performance before instruction. The most significant gains were observed in analytical thinking, problem-solving, and collaboration skills, reflecting students' ability to engage in active learning and apply knowledge to real-world contexts.

The assessment was conducted using a 21st-century career skills evaluation form developed by the researcher, which had been validated by experts for content validity and reliability. The post-instruction results indicated that students' performance was rated at a "very good" level across all skill dimensions, including technological literacy, creative production, and group communication.

These findings are consistent with the framework proposed by Trilling and Fadel (2009, pp. 48–49), which defines 21st-century career skills as comprising Learning and Innovation Skills, Information, Media, and Technology Skills, and Life and Career Skills. These components were clearly demonstrated through students' learning experiences with the cartoon-based learning modules.

The use of cartoon-based learning modules enabled students to learn about local history and culture while simultaneously developing analytical thinking through story interpretation, practicing teamwork through group activities, and enhancing technological skills through online research. Together, these skills represent essential competencies for future learning and career readiness.

3.3 Students' Opinions and Satisfaction

The assessment of students' opinions and satisfaction toward the curriculum and cartoon-based learning modules revealed that the overall satisfaction level was rated at the "highest" level across all evaluated aspects, including learning media, content, learning activities, and teaching methods. This finding indicates that students responded positively to the learning experience and perceived the instructional materials as engaging and effective in supporting their learning.

Table 4 : Results of Students' Satisfaction Evaluation

Evaluation Aspect	Level of Satisfaction
Content and Learning Materials	Highest
Learning Activities	Highest
Attractiveness of the Cartoon Media	Highest
Teacher's Teaching Methods	Highest
Overall	Highest

The results in Table 4 showed that students expressed the highest level of satisfaction particularly with the attractiveness of the cartoon media and the engaging learning activities, indicating that the cartoon-based learning modules effectively responded to students' needs and interests and provided a learning experience that was both enjoyable and meaningful.

3.4 Improvement of the Curriculum and Cartoon-Based Learning Modules

Based on the recommendations from experts, teachers, and students, the curriculum and learning modules were revised in the following areas:

1. Diversifying learning activities to better accommodate individual differences among students.

2. Adding explanatory captions to the cartoon illustrations to enhance clarity and understanding of the content.
3. Refining assessment items to ensure greater clarity and closer alignment with the intended learning objectives.

Summary of Evaluation Findings

The evaluation of the curriculum and the cartoon-based learning modules revealed that:

1. Students' post-test learning achievement was higher than their pre-test scores**,** with 100% of students meeting the achievement criteria**.**
2. Students demonstrated notable improvement in 21st-century career skills across all dimensions**.**
3. Students' satisfaction toward the learning modules was rated at the highest level in all aspects**.**
4. The curriculum and cartoon-based learning modules were further refined in terms of learning activities, explanatory materials, and assessment tools.

It can therefore be concluded that the developed curriculum and cartoon-based learning modules were of high quality, appropriate, and practically applicable in educational settings. Furthermore, they have the potential to serve as a prototype for developing other supplementary curricula in various subject areas in the future**.**

VI. CONCLUSION AND DISCUSSION

The results of this research indicate that the development of the supplementary curriculum and cartoon-based learning modules entitled *"Mueang Fa Daet Song Yang and Phra That Yakhu"* was effective in enhancing both learning achievement and 21st-century career skills among Grade 7 students. Integrating local history and cultural content through cartoon-based media enhanced students' engagement and understanding by connecting learning content with familiar community contexts. The efficiency results from the field tryout (E_1/E_2 = 83.54/81.43) exceeded the 80/80 criterion, and all students (100%) met the achievement criteria after instruction, demonstrating the effectiveness of the instructional design. In addition, students showed notable improvement in analytical thinking, technology use, and collaboration skills, and expressed the highest level of satisfaction toward the learning modules. These findings are consistent with curriculum development frameworks emphasizing systematic design and evaluation (Tyler, 1949; Taba, 1962), the integration of local contexts in learning media (Buason, 2019; Bunnak, 2023), and the 21st-century skills framework proposed by Trilling and Fadel (2009).

In conclusion, this study demonstrates that combining local cultural identity with cartoon-based learning media can provide meaningful learning experiences that enhance academic achievement and essential 21st-century career skills. The developed curriculum and learning modules effectively responded to learners' needs and can serve as a practical instructional model for supplementary subjects integrating local wisdom with modern learning approaches. Furthermore, the curriculum may be adapted for use in other subject areas or educational contexts to promote student engagement, skill development, and readiness for future learning and career demands.

VII. SUGGESTION

Based on the findings of this research, the developed curriculum and cartoon-based learning modules should be applied in supplementary courses or learning activities that integrate local history and cultural heritage with skill development, as the instructional design effectively enhances students' engagement, learning achievement, and 21st-century career skills. Teachers are encouraged to adapt the cartoon-based learning modules for different subject areas and learning contexts, particularly those emphasizing creativity, collaboration, and analytical thinking, and to modify learning activities and assessment methods to suit learners' developmental levels and individual differences. In addition, educational institutions and curriculum developers may use the results of this study as a guideline for designing learning media that combine local wisdom with modern instructional approaches in order to promote meaningful learning experiences while preserving cultural identity. Finally, future research should investigate the long-term effects of cartoon-based learning modules on students' learning outcomes and skill development, as well as explore their application across different educational levels and subject areas to enhance the broader applicability of curriculum and instructional media development.

ACKNOWLEDGEMENT

This research entitled "The Development of a Curriculum and Cartoon-Based Learning Modules for the Supplementary Subject on Mueang Fa Daet Song Yang and Phra That Yakhu to Promote The 21st-century Career Skills for Grade 7 Students" was successfully completed through the kind support of many individuals and institutions. The researcher would like to express sincere gratitude to Dr. Warut Khejonsat, Director of Kamalasai School, for his valuable guidance and continuous support throughout this study. Appreciation is also extended to the Office of Fine Arts Region 8, Khon Kaen, and the Office of Fine Arts Region 9, Ubon Ratchathani, for providing essential information and advice that contributed greatly to the success of the research. Heartfelt thanks are given to Ms. Klomjit Donpirom, Dr. Jamnapa Lamchumchang, Asst. Prof. Dr. Piriya Phitayawatnachai, Dr. Tawee Promma, and Dr. Winyu Uttra, whose expertise and constructive evaluation ensured the quality and reliability of the research instruments. Finally, the researcher wishes to express deepest appreciation to the family for their unwavering encouragement and support, which served as the primary source of inspiration in completing this research.

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