

DEVELOPMENT OF ONLINE PRACTICE EXERCISES TO ENHANCE CLASSROOM RESEARCH SKILLS FOR THE BACHELOR DEGREE IN ARTS AND CULTURE, BUNDITPATANASILPA INSTITUTE, THAILAND

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Abstract

The objectives of this research were: 1) To develop online practice exercises to enhance classroom research skills for students enrolled in the Bachelor of Education Program in Arts and Culture; 2) To compare students' classroom research skills after learning through online practice exercises; and 3) To investigate students' satisfaction with the online practice exercises designed to enhance classroom research skills. The research procedures consisted of three steps: 1. Developing online practice exercises to enhance classroom research skills for students enrolled in the Bachelor of Education Program in Arts and Culture; 2. Comparing students' classroom research skills with the established criteria; and 3. Examining students' satisfaction with the online practice exercises designed to enhance classroom research skills. The research findings revealed that: 1. The online practice exercises developed to enhance classroom research skills for students enrolled in the Bachelor of Education Program in Arts and Culture were rated at the highest level of appropriateness overall, with an arithmetic mean of 4.74. All evaluation items were rated at the highest level. The efficiency scores (E1/E2) were 89.32/81.25, which were higher than the predetermined criteria. 2. Students' classroom research skills after learning through the online practice exercises were significantly higher than the standard criterion of 70 percent at the .05 level of significance. 3. Students' overall satisfaction with the online practice exercises designed to enhance classroom research skills was at the highest level, with an arithmetic mean of 4.69. All evaluation items were rated at the highest level.

Keywords: Online practice exercises; Classroom research skills; Practice exercises

INTRODUCTION

The National Education Act B.E. 2542 (1999), amended (Second Amendment) B.E. 2545 (2002) and (Third Amendment) B.E. 2553 (2010), Section 28, stipulates that higher education curricula must be diverse and aimed at developing individuals' quality of life in accordance with age and potential. The content of the curriculum must focus on developing individuals with balanced knowledge, thinking, abilities, morality, and social responsibility. Moreover, Paragraph 3 emphasizes the specific aim of developing academic and professional expertise, as well as conducting research to advance knowledge and society. Section 30 further stipulates that educational institutions must develop effective teaching and learning processes and promote teachers' capacity to conduct research for improving learning that is suitable for learners at each educational level. Additionally, professional teaching standards require teachers to have research knowledge for problem-solving and learner development, as well as competency in applying research findings to instructional management and conducting research to enhance teaching and learning. Classroom research refers to research conducted concerning learners or instruction by teachers alongside regular teaching practices. It aims to develop, improve, or enhance learners or instruction for greater effectiveness. A key characteristic is that it is performed by the teacher in the specific subject area, focusing on essential and urgent issues that need to be addressed. The research must be conducted under normal instructional circumstances without creating new events, situations, or environments (Wongwichian, 2022).

The Faculty of Art Education, Bunditpatanasilpa Institute, offers the Bachelor of Education Program in Arts and Culture. Its primary goal is to develop graduates with four essential attributes for the modern world: 1. Knowledge – graduates must possess sufficient and essential knowledge for professional application and further development; 2. Skills – graduates must have self-directed learning skills, digital skills, and practical skills for professional improvement; 3. Ethics – graduates must demonstrate ethical conduct aligned with the discipline and requirements of professional councils; and 4. Personal qualities – graduates must possess characteristics consistent with the identity of the curriculum and institution, including those required by professional standards. 5. The curriculum includes research-related learning such as definitions, importance, principles, and types of research, theories and relevant studies,

research topic formulation, research design, instrument construction and data collection, population and sampling, research implementation, data analysis and interpretation, research report writing, integrating educational innovations into the research process for learner development, practical research training, and applying research findings to instructional improvement (Faculty of Art Education, 2024).

Practice exercises refer to instructional tools created by teachers to help students review previously learned content, build understanding, improve proficiency, and enhance cognitive processes. They help teachers assess students' understanding, build learners' confidence, facilitate self-assessment, reduce teachers' workload, and support differentiated learning (Passasasi Charoenphon, 2019). Previous studies have shown positive outcomes from developing practice exercises to enhance learner skills. For example, Gan Lu (2015) developed writing practice exercises for Chinese students learning Thai as a second language at Chiang Rai Rajabhat University. The study found that post-test writing achievement scores were significantly higher than pre-test scores, with an improvement score of 15.46 (22.08%). Students' overall satisfaction with the writing practice exercises was at the highest level, with an average score of 4.55.

Given the importance and issues described above, the researcher became interested in studying the development of classroom research skills among students enrolled in the Bachelor of Education Program in Arts and Culture through online practice exercises. The aim is to provide guidelines for enhancing classroom research skills through the developed practice exercises and to serve as a model for developing practice exercises in other subjects within the Bachelor of Education Program in Arts and Culture.

Objectives

1. To develop online practice exercises to enhance classroom research skills for students enrolled in the Bachelor of Education Program in Arts and Culture.
2. To compare students' classroom research skills after learning through online practice exercises.
3. To examine students' satisfaction with the online practice exercises designed to enhance classroom research skills.

RESEARCH METHODOLOGY

Scope of the Research

The research titled "Development of online practice exercises to enhance classroom research skills for the bachelor degree in Arts and Culture" consisted of three steps:

Step 1: Development of Online Practice Exercises to Enhance Classroom Research Skills

1.1 Document, Literature, and Related Research Review

The researcher reviewed relevant documents, theories, academic articles, domestic and international research, and educational research materials. The information gathered was used as a basis for constructing an open-ended questionnaire to collect data from higher education instructors teaching classroom research. The results were then used to guide the development of online practice exercises.

1.2 Data Collection from Higher Education Classroom Research Instructors

This step involved using the open-ended questionnaire from Step 1 to collect data from 12 higher education instructors who met the research criteria. The data obtained were used to guide the development of online classroom research practice exercises for students in the Bachelor of Education Program in Arts and Culture.

Target Group

The target group consisted of 12 classroom research instructors from Colleges of Dramatic Arts and Colleges of Fine Arts who had experience teaching classroom research or related courses.

Research Instrument

The instrument used in this stage was an open-ended questionnaire regarding guidelines for developing online classroom research practice exercises for students in the Bachelor of Education Program in Arts and Culture. The questionnaire underwent content validity and objectivity review by three experts, and all items received content validity scores of 0.5 or higher.

Data Analysis

1. Summary of Interview Results. The researcher analyzed the interview data obtained from learners using Typological Analysis and Taxonomy Analysis. Keywords were established to guide the analysis of the interview content.
2. Data Verification. Data verification was conducted using the Delphi technique to obtain the median, mode, the difference between the mode and median, and the interquartile range (IR).

1.3 Development of Online Skill-Building Exercises to Enhance Classroom Research Skills.

The researcher used interview conclusions to develop online skill exercises to increase classroom research conducting skill for students in Bachelor of Education in Arts and Culture. These exercises were created based on the ADDIE Model.

Data Analysis

The analysis focused on identifying the needs for developing online practice exercises to enhance the classroom research skills for students. Relevant documents were reviewed, including academic literature, previous research studies, curriculum frameworks, and course syllabi related to research methodology and arts and culture education. This analysis was used to determine the objectives and essential components for designing online practice exercises aimed at strengthening classroom research skills for students enrolled in the Bachelor of Education program in Arts and Culture.



Design

- 1) The content of the online skill-training module was structured into seven learning topics, including: (1) Philosophy of Research, (2) Fundamental Knowledge, (3) Research Procedures, (4) Research Design, (5) Research and Development, (6) Statistics for Research, and (7) Classroom Research. In addition, five skill-training exercises were developed. These consisted of: (1) an exercise on identifying key issues in conducting classroom research, (2) a case-based exercise on teachers' classroom research practices, (3) an exercise for developing skills in data analysis and synthesis, (4) a classroom research implementation exercise—comprising sub-exercises on writing the rationale; writing the components of Chapter 1; writing the components of Chapter 2; writing the components of Chapter 3; writing the components of Chapter 4; and writing the components of Chapter 5—and (5) a post-lesson assessment game.
- 2) The online practice exercises were designed by first developing a content map, drafting a site map, and designing the data-collection instruments. Then, these components were used to create the online practice exercises via Google Sites.



Development

The development of the online practice exercises was carried out according to the following steps:

1. Creating the online practice exercises to enhance classroom research skills.
2. Evaluating the quality of the online lesson by five experts.
3. Revise and improve the online skill practice exercises according to the experts' recommendations.



Implementation

The implementation of the online practice exercises was conducted through the following steps:

1. The online practice exercises were designed to enhance classroom research skills for students in the Bachelor of Education (Arts and Culture) program on the Google Site platform. This was piloted with learners who were not part of the sample group.
2. The efficiency of the online classroom research skills for students in the Bachelor of Education in Arts and Culture program. The data was tested by using the E1/E2 efficiency criteria.



Evaluation

1. The evaluation of classroom research skills was conducted by examining the learners' performance based on the assigned online practice exercises in order to compare their classroom research skills with the established criteria.
2. The learners' satisfaction with the online practice exercises were designed to enhance classroom research skills was also assessed.

Target Groups

1. The target group has been evaluated by the online classroom research skills by exercises properly. Five experts who teach classroom research or related courses, one hold at least a master's degree in educational research, the others have no less than five years of teaching experience at the higher education level.

2. The target group for analyzing the effectiveness of the research skills consisted of 38 third-year students enrolled in the Bachelor of Education program in Faculty of Fine Arts Education in Bunditpatanasilpa Institute in Semester 1 of the academic year 2025. This class was not part of the main sample group.

Research Instruments

The instruments used for data collection in this study were as follows:

1. An appropriateness assessment form for the online classroom research skills by exercises for students in the Bachelor of Education program in Arts and Culture.
2. An assessment form for evaluating the online classroom research skills of students in the Bachelor of Education program in Arts and Culture.

All instruments were examined for content validity and objectivity by three experts. Each item demonstrated a content validity index (CVI) of 0.50 or higher.

Data Analysis

1. The results of the appropriateness assessment of the online classroom research skills. The exercises for students were employed in the Bachelor of Education program in Arts and Culture. They were analyzed using arithmetic mean and standard deviation.
2. The effectiveness of the online classroom research skills was employed by exercises for students in the Bachelor of Education program in Arts and Culture. They were analyzed using mean, percentage, and the E1/E2 efficiency index, based on the predetermined criterion of 80/80.

Criteria for Evaluation

The online practice exercises for enhancing classroom research skills was assessed by five experts. The evaluation criteria were defined as follows:

4.50 – 5.00 indicates the online practice exercises are **the most appropriate**.
3.50 – 4.49 indicates the online practice exercises are **highly appropriate**.
2.50 – 3.49 indicates the online practice exercises are **moderately appropriate**.
1.50 – 2.49 indicates the online practice exercises are **slightly appropriate**.
1.00 – 1.49 indicates the online practice exercises are **least appropriate**.

Step 2: Comparing Students' Classroom Research Skills with the Established Standards

After developing the online practice exercises enhance to classroom research skills for Bachelor of Education students in Fine Arts Education, the researcher implemented the exercises on the Google Site platform. Then, the exercises were trialed with the sample group to compare students' classroom research skills by using the online exercises with the established standard criteria.

Population and Sample

Population

The population for this study consisted of third-year students enrolled in the Bachelor of Education program, Faculty of Fine Arts Education in Bunditpatanasilpa Institute in Semester Institute in the 1st semester of academic year 2025. There were 5 classes, totally 139 students.

Sample

The sample consisted of one class of third-year students from the Bachelor of Education program, Faculty of Fine Arts Education in Bunditpatanasilpa Institute in the 1st semester of academic year 2025, comprising 32 students, selected using multi-stage sampling.

Research Instrument

The instrument used for data collection was a questionnaire assessing students' classroom research skills. The content validity and objectivity of the questionnaire items were examined by three experts. All items received content validity scores of 0.5 or higher.

Data Analysis

1. Frequency, percentage, arithmetic mean, and standard deviation were employed to analyze the data.
2. A comparison of the posttest scores with the predetermined standard criterion of 70 percent was conducted using a one-sample of t-test.

Step 3: Investigation of Students' Satisfaction with the online practice exercises for Classroom Research

After implementing the instructional activities and assessing students' classroom research skills, the researcher had conducted a study on students' satisfaction with the online skill practice exercises. The procedures were carried out as follows:

Population and Sample

Population

The population of this study consisted of third-year students enrolled in the Bachelor of Education Program, Faculty of Fine Arts Education in Bunditpatanasilpa Institute, during the first semester of the 2025 academic year. The population comprised five classes with a total of 139 students.

Sample

The sample for this study consisted of third-year students enrolled in the Bachelor of Education Program, Faculty of Fine Arts Education, in Bunditpatanasilpa Institute during the first semester of the 2025 academic year. Each class, comprising 32 students, was selected using multi-stage sampling.

Research Instrument

The instrument used for data collection was students' satisfaction questionnaire regarding the online skill practice exercises designed to improve classroom research competencies. The questionnaire's content validity and objectivity were examined by three experts. All items demonstrated content validity indices of 0.50 or higher.

Data Analysis

Students' satisfaction scores were analyzed using arithmetic mean and standard deviation. The interpretation criteria were as follows:

| | | |
|-------------|-----------|------------------------|
| 4.50 – 5.00 | indicates | very high satisfaction |
| 3.50 – 4.49 | indicates | high satisfaction |
| 2.50 – 3.49 | indicates | moderate satisfaction |
| 1.50 – 2.49 | indicates | low satisfaction |
| 1.00 – 1.49 | indicates | very low satisfaction |

RESEARCH RESULTS

Results of Developing the online skill practice exercises to improve classroom research competencies for the Bachelor of Education in Arts and Culture. The researcher developed an online skill practice exercises format via Google Site. An example of the online learning modules created according to the site map is presented below.

1.1 Students were able to access the content and practice research skills through the online platform, as illustrated in Figure 1.

<https://sites.google.com/d/1JcKZKxTC8hTR03kuqgTk1LBckXrotl3y/p/1Yx9X72d6DRplglryEnpRto5WUvqi1dUU/edit>

Figure 1 Website linked to learning content and skill practice exercises

Source: Researcher

1.2 When students click on the website link, they are directed to the homepage of the online skill practice exercises, as shown in Figure 2.

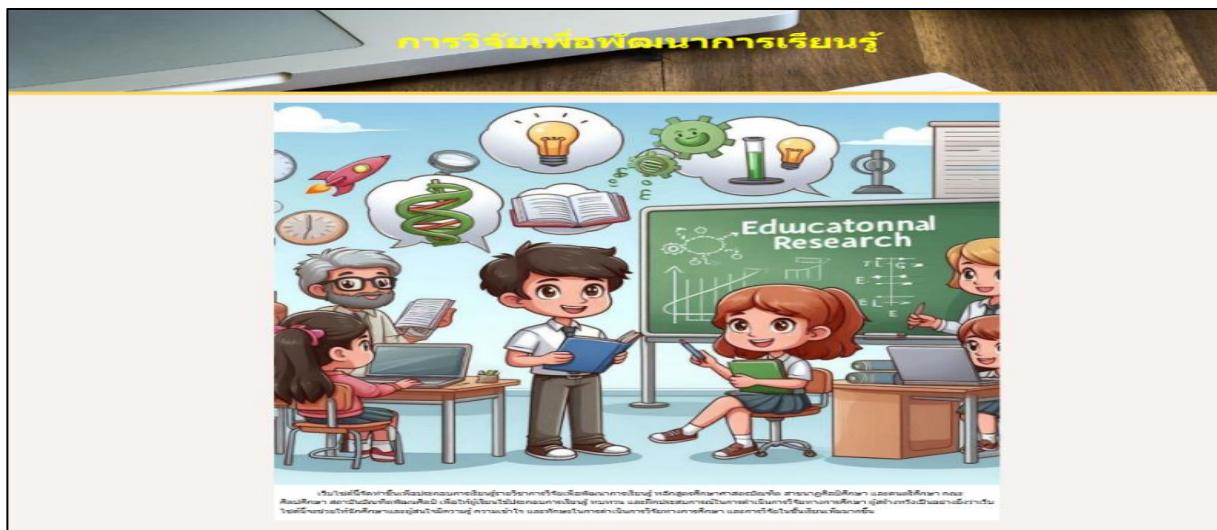


Figure 2: Homepage of Website

Source: Researcher

1.3 Students can select learning content or review previous lessons by choosing the “Learning Content” menu. They can then access the specific topics of their choice, as illustrated in Figure 3.



Figure 3 Learning content menu

Source: Researcher

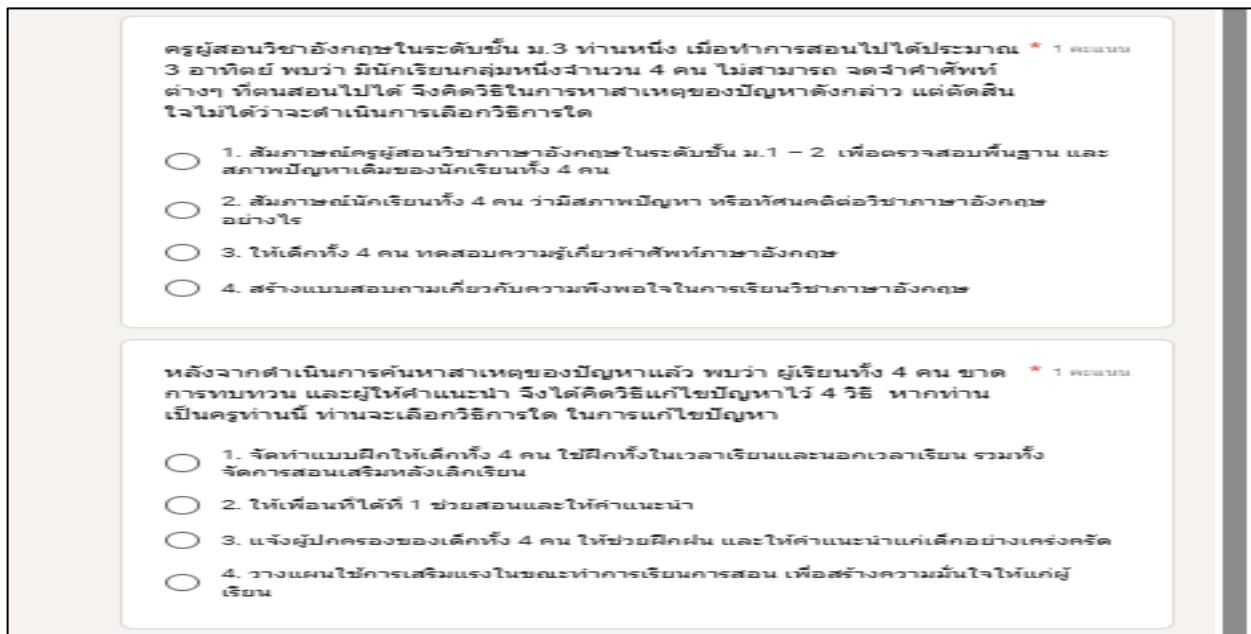
1.3 When students select the desired learning topic, E-book corresponding to their chosen content is displayed, as shown in Figure 4.



Figure 4 E-Book: Learning Content

Source: Researcher

1.5 When learners select a specific skill practice exercises, the corresponding set of questions practice exercises will be displayed, as shown in Figure 5.



ครูผู้สอนวิชาอังกฤษในระดับชั้นม.3 ห้านานหนึ่ง เมื่อทำการสอนไปได้ระดับมาก * 1 คะแนน
3 อาทิตย์ พบว่า มีนักเรียนก่อความเห็นใจนานวน 4 คน ในส่วนของ จตุรัสศรีทั้งคู่ ต่างๆ ที่สอนไปได้ จึงตัดสินใจในการหาสาเหตุของปัญหาดังกล่าว แต่ตัดสินใจในวิธีว่าจะดำเนินการเลือกวิธีการใด

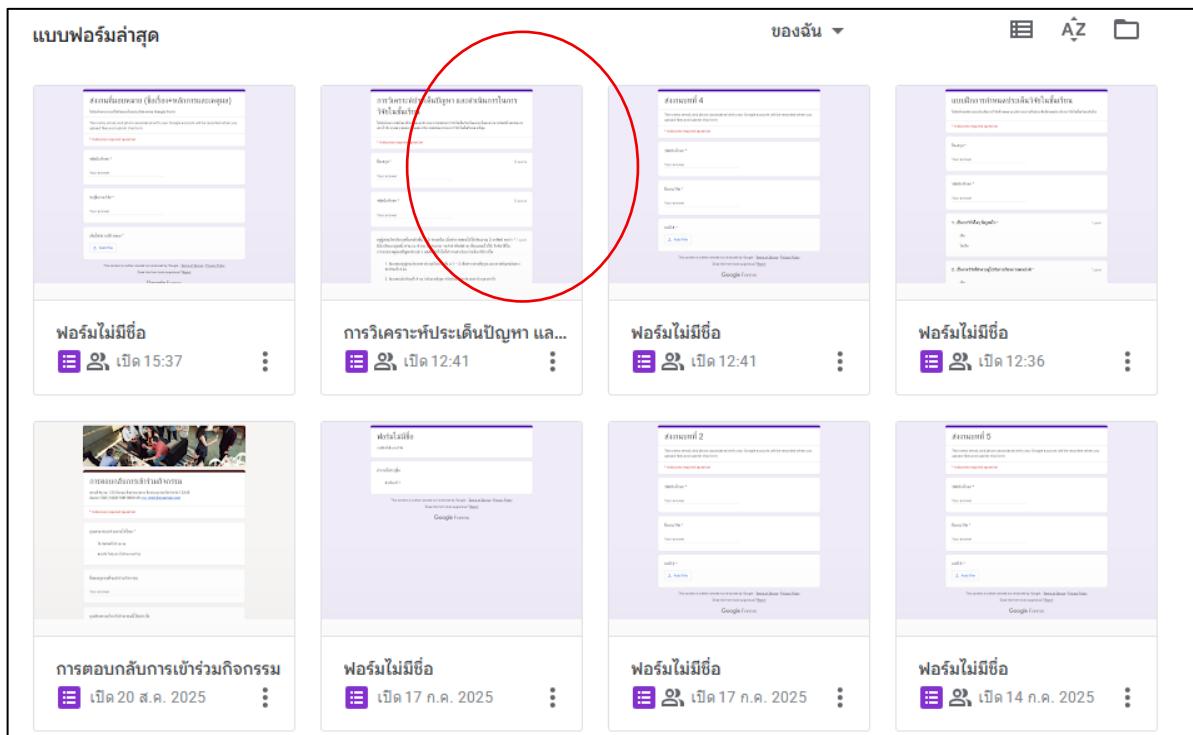
1. สัมภาษณ์ครูผู้สอนวิชาภาษาอังกฤษในระดับชั้นม.1 – 2 เพื่อตรวจสอบที่นั่นฐาน และ สภาพปัญหาเดิมของนักเรียนทั้ง 4 คน
2. สัมภาษณ์นักเรียนทั้ง 4 คน ว่ามีสภาพปัญหา หรือวิศวกรรมภาษาอังกฤษอย่างไร
3. ให้เด็กทั้ง 4 คน ทดสอบความรู้เกี่ยวกับความทึ่งพ้อใจในการเรียนวิชาภาษาอังกฤษ
4. สร้างแบบสอบถามความทึ่งพ้อใจในการเรียนวิชาภาษาอังกฤษ

หลังจากดำเนินการค้นหาสาเหตุของปัญหาแล้ว พบว่า ผู้เรียนทั้ง 4 คน ขาด 1 คะแนน การทบทวน และผู้ใหญ่ค่าแนะนำ จึงตัดสินใจให้ 4 วิธี หาคำตอบ เป็นครุภัณฑ์ ท่านจะเลือกวิธีการใด ในกรณีที่ปัญหา

1. จัดทำแบบฝึกให้เด็กทั้ง 4 คน ใช้ฝึกทั้งในเวลาเรียนและนอกเวลาเรียน รวมทั้ง จัดการสอนและนักเรียนทั้งสิ่งนี้
2. ให้เดือนที่ได้รับ 1 ช่วงสอนและให้ค่าแนะนำ
3. แจ้งผู้ปกครองของเด็กทั้ง 4 คน ให้ช่วยดีคิดใน และให้ค่าแนะนำมาแก้ไขเด็กอย่างเคร่งครัด
4. วางแผนใช้การเรียนแรงในขณะที่การเรียนการสอน เพื่อสร้างความมั่นใจให้แก่ผู้เรียน

Figure 5 Case Study of Skill Practice Exercise on Classroom Research Conducted by the instructor
Source: Researcher

1.6 The instructor can review students' submitted exercises through Google Forms. The students selected the form corresponding to check the assignment, as illustrated in Figure 6.



| แบบฟอร์มล่าสุด | ของฉัน ▾ | AZ | ☰ |
|--|--------------------|----|---|
| แบบฟอร์ม (ให้ผู้สอนดู) | | | |
| การวิเคราะห์ปัจจัยทางการค้าในประเทศไทย | | | |
| ฟอร์มไม่มีชื่อ | เมื่อ 15:37 | ⋮ | |
| การวิเคราะห์ปัจจัยทางการค้าในประเทศไทย | เมื่อ 12:41 | ⋮ | |
| แบบฟอร์ม | | | |
| ฟอร์มไม่มีชื่อ | เมื่อ 12:41 | ⋮ | |
| แบบฟอร์ม | | | |
| ฟอร์มไม่มีชื่อ | เมื่อ 12:36 | ⋮ | |
| แบบฟอร์ม | | | |
| การตอบกลับการเข้าร่วมกิจกรรม | เมื่อ 20 ส.ค. 2025 | ⋮ | |
| แบบฟอร์ม | | | |
| ฟอร์มไม่มีชื่อ | เมื่อ 17 ก.ค. 2025 | ⋮ | |
| แบบฟอร์ม | | | |
| ฟอร์มไม่มีชื่อ | เมื่อ 17 ก.ค. 2025 | ⋮ | |
| แบบฟอร์ม | | | |
| ฟอร์มไม่มีชื่อ | เมื่อ 14 ก.ค. 2025 | ⋮ | |

Figure 6 Review Students' Exercise Submissions
Source: Researcher

1.7 The instructor can provide guidance and feedback to students for improving their exercise performance by selecting the “Responses” option in Google Forms, as shown in Figure 7.

การวิเคราะห์ประเด็นปัญหา และดำเนินการในการวิจัยในชั้นเรียน

ชื่อ-สกุล *

รหัสนักศึกษา *

Figure 7 Providing Guidance and Feedback

Source: Researcher

1.8 The instructor may incorporate games or questions created using external websites to support assessment or to design learning activities for students. These can be shared in the form of either a link or a QR code, as illustrated in Figures 8–9.



Figure 8 Learning Game Link or QR Code

Source: Researcher

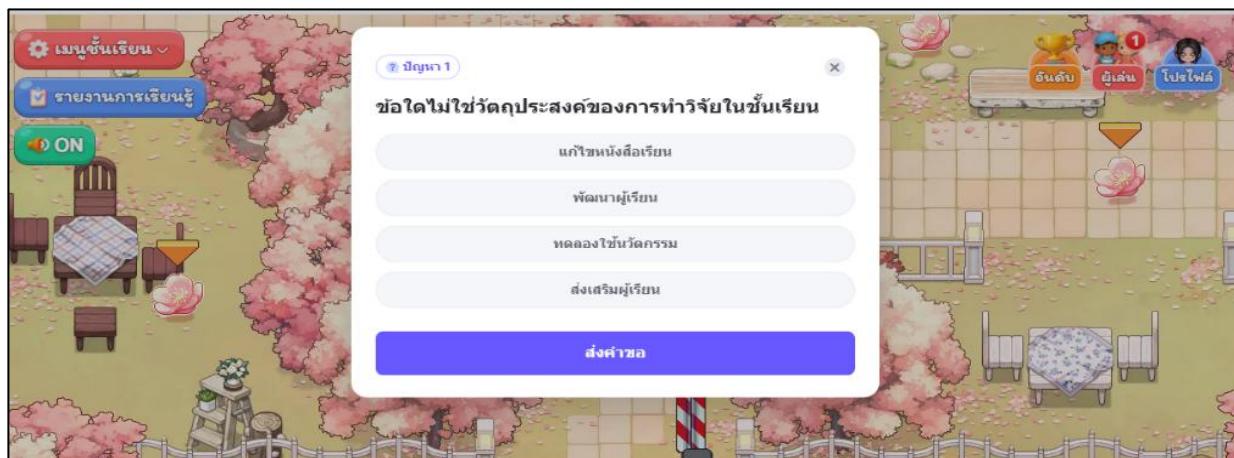


Figure 9 Learning Game

Source: Researcher

The evaluation of the appropriateness of the online practice exercises designed to enhance classroom research skills via Google Sites indicated that the overall appropriateness was at the highest level, with an arithmetic mean of 4.74. When considering each evaluation criterion individually, all items were also rated at the highest level. The evaluation results are presented in Table 1.

Table 1 Results of the Appropriateness Evaluation of the Online Classroom Research Practice Exercises for Bachelor of Education Students in Cultural Arts (N = 5)

| Evaluation Items | \bar{X} | SD. | Interpretation |
|--|-------------|-------------|----------------|
| 1. The content in the practice exercises is accurate | 4.67 | 0.58 | Highest |
| 2. The learning content in the skill-practice exercises is organized in an appropriate sequence. | 4.67 | 0.58 | Highest |
| 3. The content within the exercises aligns with the Bachelor of Education professional teacher-training curriculum. | 4.67 | 0.58 | Highest |
| 4. The exercises are appropriate for developing classroom research skills among Bachelor of Education students. | 5.00 | 0.00 | Highest |
| 5. The level of difficulty of the exercises is appropriate for learning and for developing classroom research skills among Bachelor of Education students. | 5.00 | 0.00 | Highest |
| 6. The colors and illustrations used in the exercises are appropriate. | 4.67 | 0.58 | Highest |
| 7. The skill-practice exercises are convenient | 4.67 | 0.58 | Highest |
| 8. The exercises are appropriate for learning, reviewing, and supporting instruction related to research. | 4.67 | 0.58 | Highest |
| 9. Overall appropriateness of the skill practice exercises. | 4.67 | 0.58 | Highest |
| Total | 4.74 | 0.45 | Highest |

As for the implementation of the online classroom research skill practice exercises, the evaluation of the E1/E2 efficiency yielded scores of 89.32/81.25, which were higher than the established criteria. The results are presented in Table 2.

Table 2 Efficiency Evaluation Results (E1/E2) of the Online Classroom Research Skill Practice Exercises for Bachelor of Education Students in Cultural Arts (N = 38)

| Score | Point | Mean | Percentage | Efficiency Value |
|-----------------|-------|-------|------------|---------------------|
| Formative Score | 72 | 64.31 | 89.32 | E1/E2 = 89.32/81.25 |
| Post - Test | 40 | 32.50 | 81.25 | |

2. Following the online skill practice exercises intervention for classroom research, the comparison of students' classroom research skills against a predetermined standard showed that their performance significantly exceeded the benchmark of 70 percent at the .05 level of statistical significance. The mean score was 32.50, as shown in Table 3.

Table 3 Comparison of Classroom Research Skills Scores Versus the Predefined Standard

| Examination | Amount | \bar{X} | SD | t | df | sig (2-tailed) |
|-------------|--------|-----------|------|-------|----|----------------|
| Post - Test | 32 | 32.50 | 1.24 | 20.46 | 31 | 0.00* |

* P < .05

3. The study of learners' satisfaction with the online skill practice exercises aimed to enhance classroom research skills. The data revealed that the overall level of satisfaction was at the highest, with an arithmetic mean of 4.69. When considering each evaluation item individually, all aspects were also rated at the highest level, as shown in Table 4 (N = 32).

Table 4 Learners' Satisfaction with the Online Classroom Research Skill Practice Exercises for the Bachelor of Education in Cultural Arts.

| Evaluation Item | \bar{X} | SD. | Interpretation |
|---|-----------|------|----------------|
| 1. The exercises are appropriately designed for usability and learning. | 4.87 | 0.58 | Highest |
| 2. The exercises seem interesting format. | 4.85 | 0.59 | Highest |

| | | | |
|--|-------------|-------------|----------------|
| 3. The exercises support learning, review, and self-directed study. | 4.56 | 0.57 | Highest |
| 4. The exercises help learners gain a better understanding of conducting classroom research. | 4.59 | 0.58 | Highest |
| 5. The exercises improve learners their skills in conducting classroom research. | 4.60 | 0.57 | Highest |
| 6. Overall learner satisfaction with the exercises. | 4.68 | 0.59 | Highest |
| Total | 4.69 | 0.58 | Highest |

DISCUSSION OF RESEARCH RESULTS

1. The evaluation of the online skill-practice exercises to enhance classroom research skills revealed that the overall appropriateness was rated at the highest level, with a mean score of 4.74 across all items. Each evaluation criterion was also rated at the highest level. This reflects that the exercises were carefully designed with accurate content, appropriately sequenced topics, and alignment with the Bachelor of Education (Cultural Arts) curriculum standards. This aligns with prior research on curriculum and instructional design emphasizes the importance of systematically analyzing problems and needs, reviewing content, determining formats, and designing exercises before implementation. The researcher followed a systematic development process, namely studying problems, analyzing content, determining structures and components, and developing exercises for each sub-skill—ensuring that the exercises were suitable for learning research skills at the undergraduate level.

2. A pretest-posttest comparison showed that students' classroom research skills after using the online exercises significantly exceeded the standard benchmark of 70% ($p \leq 0.05$). The mean score showed at 32.50. That's why the online exercises provided learners with opportunities for self-paced learning and review, allowing additional time to study independently. This finding is consistent with previous studies that found self-directed online skill practice exercises significantly improved learners' performance (Nattakan & Sawanant, 2022).

3. The overall satisfaction of learners with the online skill practice exercises was rated at the highest level. The mean score shown at 4.69. Each evaluation criterion was also rated at the highest level. This may be due to the engaging nature of the exercises, which enabled learners to practice research skills independently while allowing instructors to provide individualized feedback through Google Forms. This supports increased learners' knowledge, understanding, and research skills. These results are consistent with previous research indicating that well-designed skill-practice exercises enhance learners' satisfaction and competence (Sonkling, 2016). The research and development of the problem-solving skill exercises using information technology processes for Grade 11 students found that the students' overall satisfaction with the skill-building exercises was at the highest level ($\bar{x}=4.50$, $S.D.=0.66$ | $\bar{x}=4.50$, $S.D.=0.66$).

Recommendations for Further Research

1. Based on the research results, the online skill practice exercises designed to enhance classroom research skills for students in the Bachelor of Education program (Art and Culture) effectively developed learners' knowledge, understanding, and classroom research skills. Therefore, instructors teaching related courses can use this as a guideline for developing instructional innovations to improve the effectiveness of their teaching.
2. Educational institutions should apply the study conclusions as guidelines for enhancing teachers' instructional practices, particularly in developing learners' knowledge and abilities in classroom research.
3. To develop skill practice exercises, instructors should thoroughly study the course content and learning objectives of the subject for which the exercises will be developed. This ensures that the exercises align with the course content and effectively develop learners according to the intended learning objectives.

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