TMU : Innovative Thai Music Web Application

Professor Pongsilp Arunrat, Faculty of Atrs, Silpakorn University, Thailand

Abstract

Due to the COVID-19 pandemic outbreak, there has been a significant adjustment in lifestyle toward a "new normal" across many dimensions, including Thai music education, which has been significantly affected by this phenomenon. The online teaching system required major adjustments, yet there remains a shortage of accurate and consistent online educational resources for Thai music knowledge that align with current Thai society. Therefore, innovative research on Thai music was conducted, supported by the Program Management Unit for Human Resources & Institutional Development, Research and Innovation (PMU-B) under the Office of National Higher Education Science Research and Innovation Policy Council (NXPO), in collaboration with the Faculty of Arts, Silpakorn University. The research project, titled "Guidelines for the Development of Thai Music Teaching and Learning after the Coronavirus Disease 2019: The Traditional Thai Music Learning Development after the Coronavirus 2019 Pandemic Era," utilized substantial funding over a 2-year period to develop comprehensive Thai music knowledge covering traditional Thai music and regional folk music from each area. The project includes English subtitles to elevate Thai music knowledge to international standards, creating Thai music exercises and basic Thai musical instrument repair tutorials via a web application. The Web Application TMU (Thai Music Online Course) currently serves numerous active members. This research article presents the interdisciplinary integration process with Thai music that led to the project's success.

Key words : Thai music, Thai Music learning, Thai music knowledge, Thai Music Online Course,

Research Rationale

Following the COVID-19 pandemic outbreak in late December 2019, which spread to Thailand and countries worldwide, educational systems were significantly disrupted. Educational institutions had to adapt by transitioning to online learning systems. Thai traditional music education was particularly affected by these changes, as Thai music instruction relies on practical teaching methods where teachers must demonstrate musical instrument techniques for students to observe and practice, with teachers providing direct supervision to ensure correct performance. This approach requires in-person classroom instruction with teachers present. However, online teaching methods prevented teachers from achieving effective educational outcomes.
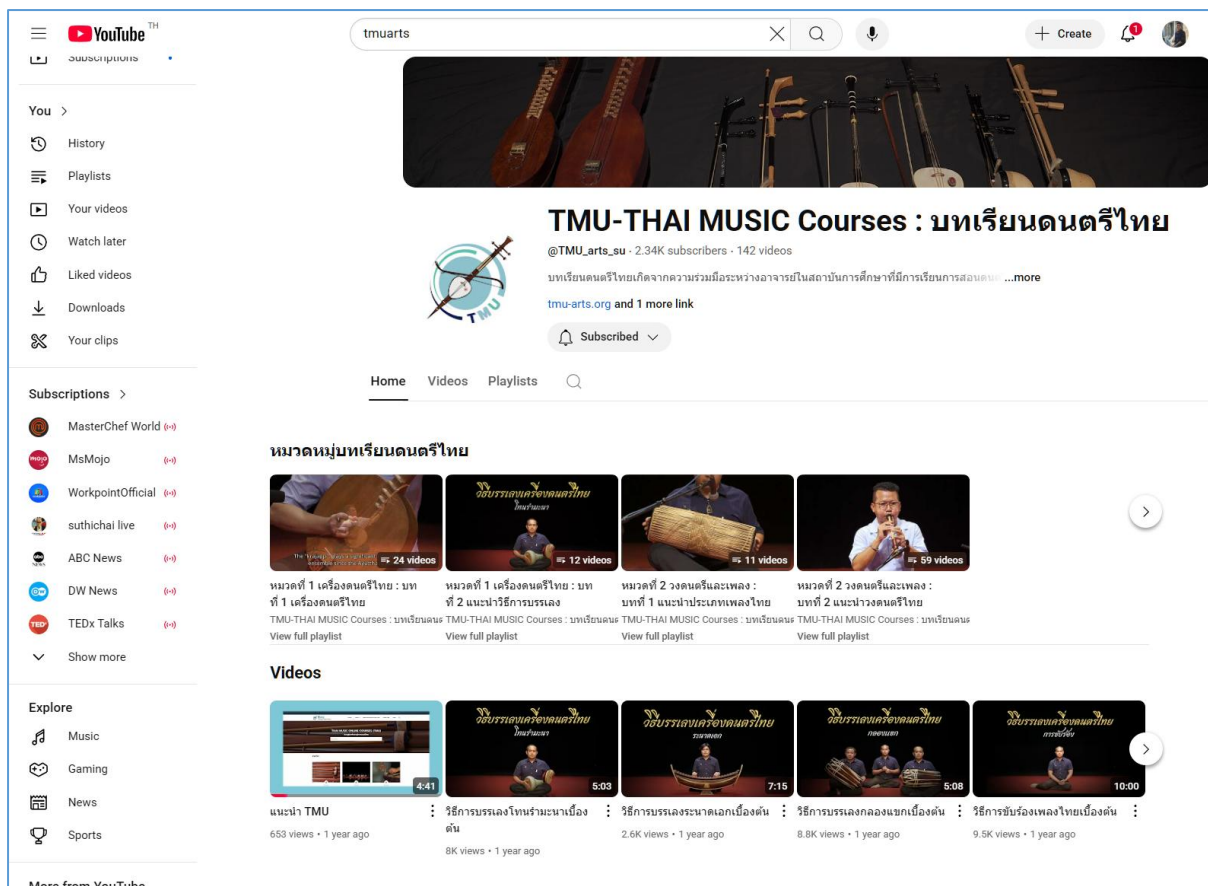
Figure 1: The Digital Supporting Learning System Design at All Levels of Thai Music Tradition through YouTube Channel

Consequently, the researcher organized meetings with teachers and lecturers responsible for Thai traditional music instruction in educational institutions to summarize the problems that arose and develop guidelines for improving Thai traditional music teaching and learning as follows:

1. The meeting chair, who is the researcher, was assigned responsibility for applying for research funding to develop teaching media in the form of an application system concerning contemporary Thai traditional music knowledge, including musical instruments, musical ensembles, Thai songs, as well as processes for repairing and constructing instruments, and basic Thai musical instrument practice exercises, while disseminating this knowledge to the general public for self-study purposes.
2. Upon completion of the application system development, a seminar meeting would be organized to exchange knowledge and test the application system, providing criticism and additional suggestions for future application system development.

Based on the meeting resolution that assigned the meeting chair responsibility for applying for research funding with sufficient budget for maximum operational effectiveness, the researcher proposed the research project titled "แนวทางพัฒนาการเรียนการสอนดนตรีไทยหลัง สถานการณ์โรค ติดเชื้อไวรัสโคโรนา 2019 (The Traditional Thai Music Learning Development after the Coronavirus 2019 Pandemic Era)." The project received funding approval from two sources: the Program

Management Unit for Human Resources & Institutional Development, Research and Innovation (PMU-B) under the Office of National Higher Education Science Research and Innovation Policy Council (NXPO), Ministry of Higher Education, Science, Research and Innovation, and the Faculty of Liberal Arts, Silpakorn University. Under a significant amount allocated to the project, the national implementation research plan was conducted for 2 years, from November 1, 2021 to October 31, 2023, with a comprehensive operational plan.

Research Methodology

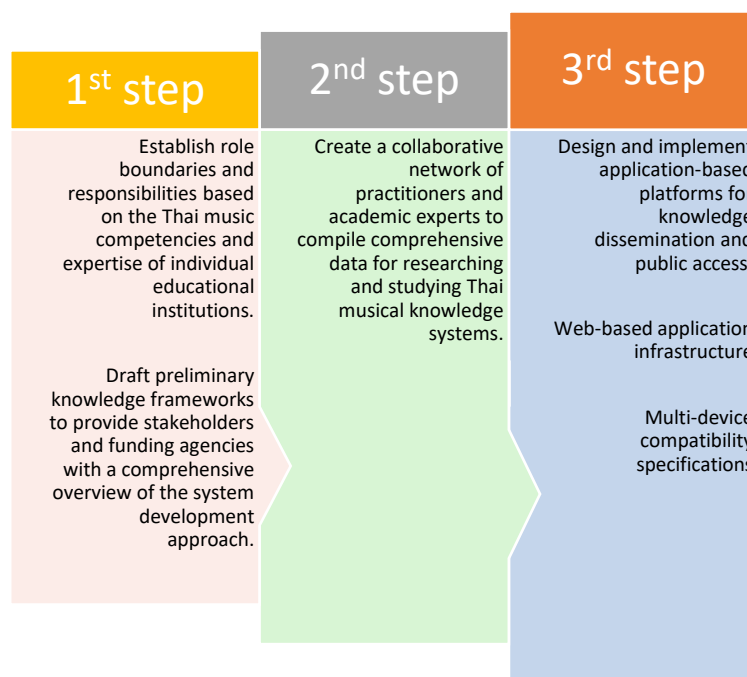| 1st step	2nd step	3rd step
Establish role boundaries and responsibilities based on the Thai music competencies and expertise of individual educational institutions.	Create a collaborative network of practitioners and academic experts to compile comprehensive data for researching and studying Thai musical knowledge systems.	Design and implement application-based platforms for knowledge dissemination and public access.
Draft preliminary knowledge frameworks to provide stakeholders and funding agencies with a comprehensive overview of the system development approach.		Web-based application infrastructure Multi-device compatibility specifications

Figure 2: Three-Step Research Methodology Framework for Thai Music Digital Learning System Development

The project assembled a 6-member teaching-research team in Thai traditional music based on their expertise in teaching Thai traditional music in schools and universities, who understood the challenges in Thai traditional music education. The project leader defined the scope and various operations before summarizing work for final Thai traditional music knowledge compilation. Additionally, the project established a video recording team of 10 members, an audio recording team of 4 members, and a lighting team of 4 members.

Furthermore, the project compiled knowledge about musical instrument repair and construction, which was innovative work that no one had systematically undertaken before. This was particularly important because the current state of Thai traditional music education in the educational system faced significant budget constraints for purchasing and procuring Thai musical instruments. Thai musical instruments are used continuously and deteriorate over time, frequently experiencing damage. Budget acquisition requires time for project preparation to request the purchase of new Thai musical instruments, and consideration for purchasing new musical instruments often ranks lower than other equipment, typically receiving budget allocation that is less urgent compared to other school equipment.

The compilation of knowledge about Thai musical instrument repair and construction emerged with master craftsman Suphapon Traiwiman (ศุภพล ไทรวิมาน) as the knowledge transmitter, covering topics such as changing saw (Thai bowed string instrument) strings, installing lead weights for ranat (Thai xylophone) and khong wong (Thai gong circle), changing strings for jakhe (Thai zither) and khim (Thai hammered dulcimer), basic repair of khlui (Thai flute) and pi (Thai oboe), and basic drum repair. Master Suphapon Traiwiman's willingness to transmit this knowledge appeared challenging, as Thai musical instrument craftsmen naturally make their living through repairing and constructing Thai musical instruments. If this knowledge were transmitted, it would enable others to practice until they could repair and construct Thai musical instruments themselves, potentially reducing the craftsman's income.

The filming of Thai traditional music knowledge involved selecting musicians with specific instrumental expertise. There were 40 Thai musicians designated for recording Thai traditional music knowledge, all experienced and skilled instrumentalists. The project leader participated in the knowledge recording process. Before production, meetings were organized with video, audio, and lighting teams, as well as all musicians, for one day of rehearsal before beginning knowledge recording at Songpol Theater in Silpakorn University. This ensured optimal musical performance outcomes, conducted multiple times between August 2022 and October 2023.

In addition to compiling Thai traditional music knowledge, the project developed basic Thai musical instrument practice exercises, creating notation systems and practice techniques for basic musical instrument performance that were easily understandable through visual systems and step-by-step explanations from specialists of each instrument for self-practice. The Thai musical instrument practice exercises included saw sam sai (three-string fiddle), saw duang (higher-pitched fiddle), saw u (lower-pitched fiddle), jakhe (Thai zither), khlui (Thai flute), khim (hammered dulcimer), ranat ek (higher-pitched xylophone), ranat thum (lower-pitched xylophone), khong wong yai (large gong circle), klong khaek (double-headed drum), thon ramana (goblet drums), as well as basic vocal techniques. The project leader supervised, controlled, and synthesized various data until achieving a practical exercise set that would benefit Thai music teachers who were not proficient with certain musical instruments, enabling them to use these as teaching media to help students practice independently, including general individuals interested in self-practicing Thai traditional music.

Figure 3: Example of TMU Thai Music Online Course

After completing the filming process, the project proceeded to the audio narration recording stage, which integrated innovative and easily understandable concepts, different from typical Thai musical ensemble demonstration videos. The project leader provided the narration

voice. However, to make the research widely accessible at the international level, English narration was prepared to elevate Thai traditional music knowledge to international standards.

Development of TMU Web Application System

The application system was transformed from a downloadable format to a web application. A web application is designed to operate directly in web browsers without requiring full application downloads to devices. This results in relatively low storage requirements, convenient accessibility, faster operation, and protection from unauthorized access or hacking by malicious groups, since users do not need to download the web app. This makes web apps easily accessible without requiring end-user maintenance, including hard drive capacity requirements. Web applications receive automatic software updates and security enhancements, with minimal security breach risks.

The web system was designed to benefit the dissemination of Thai traditional music knowledge to users including teachers, students, and the general public through video presentations via the YouTube channel named "TMU-THAI MUSIC Courses : บทเรียนดนตรีไทย."

The project leader conceived the web application name TMU, abbreviated from Thai Music University, intending this name to correspond with the research funding provider: PMU-B. Using this name represents historical significance in academic Thai traditional music education, with an organization recognizing the importance of this matter and promoting this project's emergence, with the full web application name being "TMU Thai Music Online Course" and the website accessible at https://tmu-arts.org/.

The platform includes detailed instructions for using the TMU application and membership registration for benefits including data recording for members studying Thai traditional music knowledge. The system records which stage and category members are studying, allowing them to continue from that point when accessing the system again until completing all knowledge components. Online certificates are provided for each category and upon completing all knowledge components, accessible through QR Code scanning.
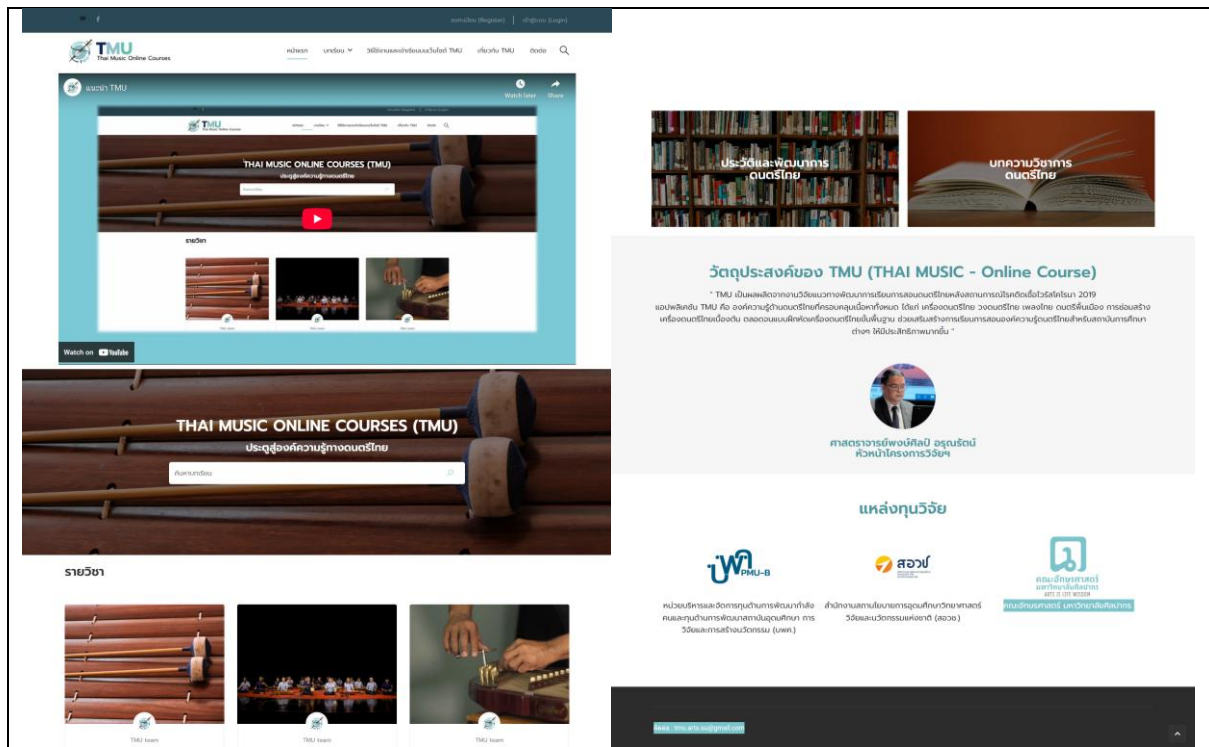
Figure 4: Web Browser Frame Showing TMU Website (https://tmu-arts.org/)

Research Results Summary

The research implementation over 2 years is summarized through Economic and Social Impact Pathway analysis of project implementation consisting of 6 components:

Table 1: Economic and Social Impacts Pathway analysis

Input	Output	User Beneficiary	Outcome	Impact
1. Thai Musical Instruments Knowledge Compilation	Basic knowledge about Thai musical instruments through comprehensive audio-visual	Teachers, lecturers, students, general public, and foreigners interested in Thai musical	Teachers gain easily understandable Thai musical instrument teaching formats from TMU web application	Complete Thai musical instrument knowledge for each category with

Input	Output	User Beneficiary	Outcome	Impact
	recording systems with synthesized narrations corresponding to current social conditions, including English explanations for international dissemination through TMU web application system	instrument knowledge		online certificates for TMU web application members
2. Thai Musical Ensembles Knowledge Compilation	Basic knowledge about Thai musical ensembles through comprehensive audio-visual recording systems with synthesized narrations corresponding to current social conditions, including English explanations for international dissemination through TMU web application system	Teachers, lecturers, students, general public, and foreigners interested in Thai musical ensemble knowledge	Teachers gain easily understandable Thai musical ensemble teaching formats from TMU web application media	Complete Thai musical ensemble knowledge for each category with online certificates for TMU web application members
3. Thai Songs Knowledge Compilation	Basic knowledge about Thai songs through comprehensive audio-visual recording systems with synthesized narrations corresponding to current social conditions, including English explanations for international dissemination through TMU web application system	Teachers, lecturers, students, general public, and foreigners interested in Thai song knowledge	Teachers gain more easily understandable Thai song teaching formats from TMU web application media	Complete Thai song knowledge for each category with online certificates for TMU web application members

Input	Output	User Beneficiary	Outcome	Impact
4. Thai Musical Instrument Repair and Construction Knowledge Compilation	Basic knowledge from experienced musical instrument craftsmen transmitting Thai musical instrument repair and construction processes, instrument tuning, and Thai musical instrument maintenance through comprehensive audio-visual recording systems via TMU web application system	Educational institutions lacking budget for acquiring new Thai musical instruments, needing to use existing damaged instruments for basic repair and maintenance, as well as students interested in musical instrument repair and construction as foundation for future career development as Thai musical instrument craftsmen, including future professional teachers capable of repairing Thai musical instruments in schools independently	Teachers and students easily understand Thai musical instrument repair and construction, previously never systematically undertaken, through TMU web application media	Complete Thai musical instrument repair and construction knowledge with online certificates for TMU web application members
5. Basic Thai Traditional Music Practice Knowledge Compilation	Basic knowledge about basic Thai musical instrument practice that is easily understandable with notation systems for self-practice through TMU web application systems with synthesized narrations corresponding to current social conditions,	Teachers, lecturers, students, general public interested in basic Thai musical instrument practice	Teachers gain teaching formats and methods for students to practice Thai musical instruments independently, helping teachers lacking proficiency in certain instruments to comprehensively teach musical instrument practice from TMU web application media	Complete basic Thai musical instrument practice knowledge for each category with online certificates for TMU web application study participants

Input	Output	User Beneficiary	Outcome	Impact
	including English explanations for international dissemination			
6. Research Dissemination Conference	Research publicity conducted at Pin Monthon-Moniya Conference Room, S.D. Avenue Hotel on April 30, 2024	Teachers, lecturers, students, general public	All research outputs, TMU web application access methods, membership registration and special member privileges	Conference participants receive certificates for training and utilizing Thai traditional music knowledge from TMU web application

Future Development Roadmap for TMU Platform

These four development components represent a comprehensive expansion strategy for the TMU web application. Here's an analysis of each component:

1. Enhanced TMU Web Application System

Develop the TMU web application system to enable teachers to assign students to study while monitoring whether their students have completed assigned Thai traditional music knowledge comprehensively, with online certificates as evidence for students who complete their studies.

2. Expanded Knowledge Repository

Create additional Thai traditional music knowledge in the TMU web application by adding a category called "Thai Traditional Music Knowledge Repository," including Thai traditional music history and development, updated Thai music data collection in line with present development and usage, as well as academic articles on Thai traditional music from both the project leader's work and Thai traditional music scholars who permit dissemination as academic contributions for a sustainable Thai traditional music academic database.

3. Knowledge Exchange Platform

Establish Thai traditional music knowledge exchange among lecturer groups, teachers, educational personnel, students, and the general public, enabling additional Thai traditional music knowledge inquiries through the YouTube channel "TMU-THAI MUSIC Courses : บทเรียนดนตรีไทย."

4. Community Engagement

Organize online discussions between the project leader and TMU web application members to understand problems and additional requirements from members, implementing improvements and problem-solving for sustainable effectiveness.

Usage Statistics and Impact Assessment

Since the launch of the TMU web application, the platform has demonstrated significant impact in Thai traditional music education. The framework consists of specialized teams for content development and audio-visual production, totaling 25 across all functional areas. Currently, the platform serves 142 open-access comprehensive videos featuring around 60 attending participants as a networks of musicologists, craftsmen and musicians. Over 2,300 registered users are including 250 teachers and educational personnel, 850 students, and 1,200 general public users. The platform has issued more than 300 completion certificates across various categories as indicating active engagement and successful knowledge transfer.

Conclusion

Traditional music scholars typically lacked the technical knowledge for web application development, while technology experts lacked deep understanding of Thai musical pedagogy. This project's success came from bridging that gap through collaborative teams. Digital educational tools weren't traditionally valued in academic promotion and recognition systems, which favored traditional research publications and performances, along with funding challenges.

The TMU web application represents a groundbreaking innovation in Thai traditional music education, successfully bridging the gap between traditional teaching methods and modern digital learning platforms. Through comprehensive interdisciplinary collaboration and substantial investment in knowledge preservation and dissemination, the project has created a sustainable educational resource that serves both domestic and international audiences, ensuring the continuity and global accessibility of Thai musical heritage.

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