

# THE CREATION OF DIGITAL GAME ON SMARTPHONE TO PROMOTE LANNA CULINARY ART IN CHIANG MAI PROVINCE

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## Abstract

The mix method was used in this research article, which was based on the concepts of local culinary arts and mobile game design. The study takes place in Muang, a district in Chiang Mai province, and the subjects are 30 undergraduates chosen using a purposive sampling method. In terms of the tools used in the study, there are three types: 1) Four expert and specialist interviews 2) A workshop with 30 attendees 3) Questionnaires for research participants. After that, all of the primary data was analyzed using descriptive statistics and narrative reasoning.

The result of the study reveals: 1. The ways in which information concerning culinary arts, especially those used to promote Lanna's culture, is currently disseminated is through museum exhibitions and workshops, which are less likely to satisfy their interest. 2. Knowledge and interdisciplinary approaches in design and development are required to create a digital game on smartphones with the goal of promoting certain cultural aspects among Thai teenagers. Not only how the game works, but also how to keep players motivated while playing, must be incorporated into the design by 1) having the game characters tell the story, 2) presenting dominant characteristics of Lanna culture, and 3) designing the gameplay around Lanna cooking methods. 3. The digital games on smartphones promote the culinary arts of Lanna's culture to present its identity with ease of use for users.

The research findings suggest that to apply knowledge of cooking culture in digital game development, it is necessary to involve experts in all the related areas which include scientists, mathematicians, experts in cultures, and artists in the project to ensure that the game is guided in the right direction so that it can be used as teaching material in classroom and part of museum exhibition. This way, the game will allow more young people, as well as tourists with an interest in culture, to access another form of content representing the arts and culture of the country.

**Keywords :** Digital Game Design, mobile Game, Lanna Culinary Art, Cultural Promotion

## Introduction

Lanna food is local food with uniqueness. It is different from that of other regions or countries around the world, so it is considered cultural heritage, gathering and transferring wisdom for a long period of time (Thongmee O. et. al., 2015) At present, Chiang Mai is seen as the center of the Lanna kingdom, influenced by different local cultures and a variety of such ethnic groups as Tai Yuan, Tai Lue, and Tai Yai. This results in special cooking methods, combining and adapting both the tastes and ingredients from the settler community, making its food culture valuable and distinctive, with proper nutrition (Suwanapha C. et al., 2017) all of which make the local dishes cultural products for the region, and are therefore worth the promotion and preservation. However, while immigration grows, local wisdoms are abandoned. This is particularly true with young generation (Aromkliang T. and Chatraphorn S. (2014), leading to culture loss. Earlier in culinary history, knowledge related to cooking methods were passed down in 3 distinguished ways: observation, word of mouth, and practice (Sharif, M.S. et al., 2018) by family members and one's community. Nowadays, in a more modern society, people have become more isolated from their neighbors, or even from their family which resulted in changes in culture transmission, especially among Thai teenagers.

Media and technology in the 21st century play an important role in presenting and transferring knowledge for its users, young people in particular. Therefore, instructors should integrate technology into their lessons to enhance the student's eagerness to learn. One of the most preferable technologies, appropriate for teenagers, is digital games. Sung H.Y. et al. (2017) says that educational games are practical tools to increase students' motivation and help them connect with the lessons being taught in the class. Similarly, Tlili A. et al. (2016) states that educational games on mobile phones play an important role in creating an effective learning environment and drawing learners' attention, allowing them to gain new knowledge and experiences while being motivated.

This suggestion is valid not only for fundamental subjects like science, mathematics, or English language, all of which often benefit from digital games when used as teaching materials. Some of those used to transfer knowledge in cultures are a game designed for architectural heritage promotion (Malegiannaki I. A. et al. (2020) cultural heritage in visual arts (Zhao S. et. al., 2018) and knowledge in producing local products (Chai-Arayalert, S., & Puttinaovarat, S. 2021). Still, there have not been studies and game design to promote food and culinary traditions. In the gaming industry, meanwhile, there have been many cooking games that simulate cooking methods in real life such as Cooking Mama. Most of this kind of game represents European food like hamburgers and pizzas, or Japanese one like sushi and ramen, but there has not been Thai food, especially Lanna's food. Therefore, a game designed and developed with Lanna culinary culture content is likely to generate interest in such culture among game players.

As above-mentioned, the research realized obstacles to transferring knowledge in culinary art, and meanwhile see the promising future in using digital games, compatible with modern lifestyle, to reach young generation. Moreover, the game can establish a connection between instructors and learners in education institutions, museums, or local learning centers whose objectives are to promote traditional culinary skills.

Consequently, development of a digital game with the content concerning Lanna cuisine is aimed to promote Lanna culinary art among Thai teenagers in the northern region of the country. The researcher employed a mix method, collecting data from interviews with experts and specialists in Lanna culture, game design, and educational technology. All the raw data were analyzed to arrange a workshop so that players had a chance to participate in the design stage of this Lanna cooking game, that the researcher used the game as a tool to collect more data from the research subjects via a questionnaire concerning usability evaluation (Federici, S. & Borsci, S., 2010).

Obviously, studies and development of digital games with cultural heritage content have potential to benefit the locals both directly and indirectly, which includes the community itself and tourism. As mentioned earlier, the researcher was intended to conduct research concerning digital game development for smartphones to promote Lanna culinary art in Muang district, Chiang Mai, to create an outline for game design and the results from this research can be applied to cooking games for educational purposes with regard to food cultures in other regions. In addition, the findings can be used in the gaming industry to further develop more games for food culture promotion.

### **Research Objectives**

1. to study methodology for Lanna culinary art promotion among Thai teenagers living in Muang district, Chiang Mai, at the present time.
2. to develop guidelines for digital game design for culinary heritage conservation for educational institutions and Thai public sector organizations.
3. to present the digital game designed to promote culinary arts particularly for Thai teenagers living in Muang district, Chiang Mai.

### **Literature Reviews**

The results of literature review concerning Lanna culinary art, digital game development, and cultural promotion reveals beneficial outcomes found by many academics. Lanna cuisine is considered local food with distinctive characters. Suwanapha C. et al., (2017) explains the term local food as the food consumed by the local on a daily basis and special events or traditions and cooked with condiments and ingredients found in both nature (gathered or hunted in the forest) and household (cultivation and farming). The food is often cooked with unique methods, resulting in distinctive tastes depending on its location, but common features can be identified

as 1) being consumed in daily life and special events 2) being cooked with local ingredients and condiments 3) being prepared from simple to complicated methods in order to preserve original tastes of the ingredients 4) using a variety of cooking methods and techniques 5) employing the methods influenced by seasonal variations. Lanna cuisine, in fact, can be classified according to seasons, customs, tribes (Bangsud S. and Arom P., 2015) and cooking methods, whereby the Lanna used to name the dishes. For example, Kaeng Kanoon, whose main ingredient is Kanoon or jackfruit boil with traditional condiment called Kaeng, or Larb Kwai, whose main cooking method is mincing (Larb) meat before adding local condiments and spices such as makhaen (Sirikham N., 2018) Reviewing Lanna culinary art literature, the researcher noticed some key content of its cooking characteristics to be used in data collection and analysis for the game design.

Unesco emphasized the importance of traditional food preservation for new generation in the workshop held to discuss traditional knowledge in order to transfer cultures and identities among members of each community or even as citizens (UNESCO, 2007). The study conducted by Aromkliang T. and Chatraphorn S. (2014). suggests 3 methods to transfer folk wisdom of Lanna cooking methods which include cultural values, beliefs, and skills. 4 practical guidelines to be considered when transferring Lanna food culture include (1) communicators, taking the advantage of databases, providing opportunities or holding events, being a lecturer, communicating with communities, fostering and honoring local sages. (2) receivers, strengthening the knowledge to be learned by the locals and raising awareness of the importance and advantages of folk wisdom in terms of Lanna cruising, generating motivation, practicing skills to become independent learners, observe and memorize (3) transfer, demonstrating, cooperating, creating, and sharing (4) results of the transfer, emphasizing research, preservation, restoration, and further development of Lanna local cuisine.

After reviewing wisdom trasfer literature, the approaches whereby the knowledge in Lanna food are often applied to content used in educational institutions, schools or museums with a resource person demonstrating how to cook particular dishes in an authentic way and sometimes including cooking activities that allow visitors to engage. The researcher held an opinion that interactive media, appropriate for learners, can strengthen such presentation, keep the learner interested in the content being presented, and retain their attention.

Main concepts of digital game design is identified by Zubek R. (2020) as 1) game system: the design of game rules influenced by mathematical patterns or programming so that different players can follow in order to achieve the same goals 2) the design of game world to generate the sense of reality 3) the design of game characters and storyline so that the players understand the gameplay and feel as if they are in the game 4) the design of game quest ideas with different difficulty levels to challenge the players, which normally start with the easiest one, and gradually become more challenging to prolong the players' attention (Schell, J., 2020) 5) graphics and sound designs 6) user experience and user interface designs or the design of how the players

and the game itself interact (Deacon, P., 2020). All the elements mentioned in the design stage will be used in the following development of digital game. Fullerton, T. et al. (2004) suggests the idea of iterative game design, which is the method to develop games as a cycle, repeating the processes of making the game prototype, testing and analyzing. The final stage of the development, therefore, is the result of continuous discussion between game designers and testers. This process greatly benefits game developers to take advantages of user experiences to identify possible core elements that would contribute to the sense of enjoyment before selecting most effective ones. Reviewing game design literature, the researcher understood the concept, design process, and game testing to be applied in the design and development of Lanna cooking game.

### **Research Methodology**

This research is Mix Method Research conducted in Muang district, Chiang Mai with the subjects of 30 undergraduates majoring in game design and originally coming from northern region of Thailand, selected with a purposive sampling method. Since the goal is to obtain details to be used in game design, it is essential to involve research subjects with some basic understanding in game development.

1) interviews with 4 experts and specialists in Lanna culture, especially in terms of cooking, game design, and educational technology using open ended from created by the notion of folk wisdom transfer by Aromkliang T. and Chatraphorn S. (2014). in order to gather information concerning culinary art of Lanna culture and the methods to be used with knowledge transfer and game elements

2) workshop and group discussions with regard to core elements in digital games to promote culinary art of Lanna cuisine based on the fundamental of game design. (Adams, E., 2019) studies the elements of digital game designs that support such cultural promotion and reflect Lanna identities.

3) questionnaires for satisfaction evaluation including usability, usefulness and engagement evaluation among the research subjects, at least 30 participants, formed by the evaluation used by Federici, S. & Borsci, S., (2010) to identify whether the players are satisfied with the game. This is used to examine users' satisfaction after playing the game. The data were collected from interviews, observation, records, classification, documentation of the results. While quantitative information was analyzed with basic statistics, qualitative information derived from synthesizing and analyzing the data before being narrated. All the data were collected from June 2020 to February 2021.

### **Research Result**

After studying culinary art of Lanna cuisine in Muang district, Chiang Mai and the development of digital games to promote such culture, the researcher conducted in-depth

interviews with specialists in Lanna culture in terms of knowledge and cultural transfer, held a workshop with game testers, followed by group discussions, and questionnaire completion with regard to satisfaction after playing the game designed to promote Lanna cuisine. Once all the data were collected, the researcher started to analyze them in both qualitative and quantitative terms before narrating the results according to the research objectives as follows:

1. The discussion with experts in culture and academicians in education reveals that, at the present, there are 5 common methods by which knowledge in culinary arts in Muang district, Chiang Mai: 1) classroom learning 2) talks by resource persons expertised in Lanna cooking methods, some of which also include demonstration as activities outside the classroom 3) self-taught method when visiting local exhibitions of local Lanna culture 4) self-taught when browsing through directory websites showing pictures and videos of such content 5) workshops teaching participants to prepare Lanna dishes

2. Since the development of digital games for cultural promotion needs Interdisciplinary, the designer team has to integrate and apply knowledge in different fields, and this research includes

2.1 Knowledge in Lanna culinary art in all aspects, including sources of ingredients in the area, cooking methods, types of dishes, the relationship between food and traditional belief, as well as nutrition values, are considered so that the designer team can apply them into the gameplay. This also inspires the team when designing game elements such as graphics of the ingredients. Once the designers understand the characters or dominant features of each ingredient, they will be able to generate a clearer version of game graphics for the players

2.2 Knowledge in Lanna history which helps the designer team to understand the origins of the culture practice in a particular community. For example, Lanna culture was formed by a variety of ethnic groups settling in the same area, resulting in cultural integration in many aspects of life including cooking methods. Knowing this, the team will be able to design each game element with more precise details. To illustrate, knowing that Kaeng Hang Lei, a Lanna dish, was influenced by a tribe called Tai Yai, the designers will be able to generate the environment and game scene design based on Tai Yai history so that the players have a better experience while playing or cooking the dish.

2.3 Knowledge in game design, the designer team should have a good understanding in game rule design, gameplay, and players' experience by integrating the knowledge mentioned in 1 and 2 to create the game most suitable with the players' needs while reflecting the uniqueness of Lanna culinary art.

2.4 Knowledge in narrative design, to tell a story concerning particular cultures, it is important to narrate the story through game characters because such stories often contain a large amount of information. Therefore, players need to feel as if they are part of the game, or they are in the game world through the eyes and actions of their protagonist. The character's

facial expressions and body language are essential in conveying the sense of food culture and eating simulation.

2.5 Knowledge in technology and computer programming is also important in software and hardware selection in game development. That is to say, it is important when the team creates game graphics of game characters, scenes, and user interface as well as the design of how the game would interact with its players.

3. Evaluation and descriptive statistics categorize the research outcomes into 3 areas: Satisfaction evaluation in terms of usability, In this part, the designer team considers the level of content and convenience, for example gradually increasing the difficulty levels of the game quests, divided complex content into smaller parts and embedded them into the game story. Aesthetic designs also emphasize the importance of players' perception through colors, graphics, and sound, as well as the selection of technology and software to be used for game development. The research subjects agreed that the game can be played with ease, as the top three highest scoring areas found in the evaluation are user interface: game interface is consistent and easy to use 2) Feedback are given clearly; status, score, and outcome 3) game terminology and language are easy to understand.

The satisfaction evaluation in terms of the benefits of playing the Lanna Cooke game, based the content on the research objectives and designed to suit the needs and interests of the target group reveals 3 highest scores in 1) learning objectives, which are integrated into the core game design 2) a meaningful game story and game play 3) appropriate levels of game challenges. All these findings show that the players understand the game story and the game design itself is appropriate for educational purposes. That is to say, the game design and learning objectives need to be considered with the level of game difficulty to challenge the players and deliver the content successfully.

The satisfaction evaluation to motivate or maintain the players' attention throughout the gameplay. The target content presented in the game, the evaluation of core elements in game design which help the players to understand the gameplay, strategies to win the game and become part of the game in a short period of time. This kind of game is developed to provide its players with an impressive experience even after playing it for the first time. In addition to this, the game itself serves as a learning tool to promote food culture, which is designed to generate interest and the sense of enjoyment at the same time.

More importantly, this game is designed for the players to practice and learn different cooking skills at their own pace. The result of satisfaction evaluation shows a similar trend in 3 most valuable assets 1) the game is able to create an effective learning environment with pleasure 2) the game is able to motivate the players to become more interested in Lanna culinary art 3) the game is seen as a more efficient way to deliver cultural content when compared to traditional media

## Discussion

This research found that there are five ways to promote the art of Lanna cooking in the present situation, namely 1) learning in the classroom 2) giving lectures who are experts in Lanna cooking to give lectures and demonstrate methods. Cooking in learning activities outside the classroom 3) Self-study through exhibits in the Lanna Folklife Museum 4) Self-study through a website that combines knowledge in still images and animations. 5) Workshop on teaching Lanna cooking as the research of Aromkliang T. and Chatraphorn S. (2014). It can be seen that a venue and a source person in a specific area are required for number 1 to 3 while according to 4, senses of perception are limited to only vision and auditory. Finally, although this could provide learners with first-hand experience in cooking, the conditions of time and place make it inconvenient. The digital game, Lanna Cooking, then has potential to be an effective option to transfer knowledge in Lanna food from the game story where the players can learn and practice their cooking skills while playing without any of the limitations mentioned earlier.

With regard to the development of digital games to promote cultural heritage, fundamental knowledge in game design, technology and programing, and the art of storytelling are not sufficient for designing an entertainment game. Experts in Lanna's culinary art, as well as historians, also play an essential role in the design stage of the game, which can be considered interdisciplinary. In addition to this, testing and efficiency analysis to identify and quickly correct any flaws found in the design.

As for the development of digital games to promote cultural heritage, it was found that Digital game design requires an interdisciplinary body of knowledge where designers must use multidisciplinary knowledge or co-designers come from multiple disciplines. In this research, the game design team needed knowledge in the following areas: 1) knowledge of Lanna's culinary arts, 2) knowledge of Lanna history, 3) knowledge of game design, 4) knowledge of the art of storytelling, and 5) Knowledge of technology and programming is consistent with Zubek R. (2020) and Fullerton, T. et al. (2004), iterative game design, a cyclical game development process of combining methods. Prototyping, testing, and final product analysis repeat several steps through constant discussions between designers and testers

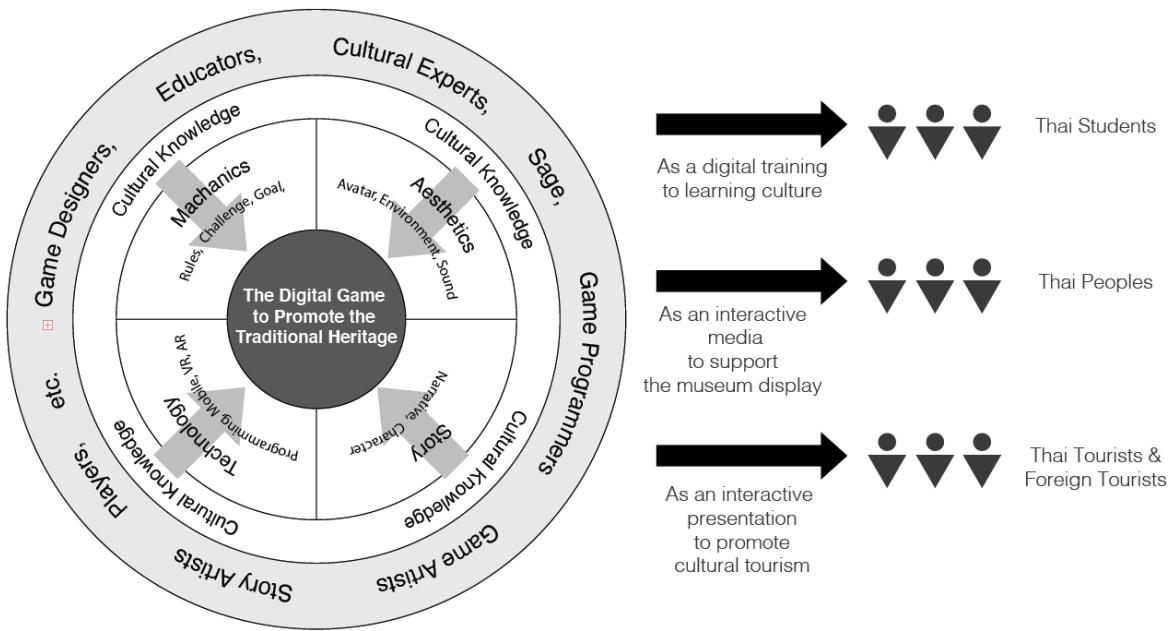
For evaluating the use of the game to promote the art of Lanna cooking, the findings are 1) the samples agreed that the game was easy to use because the design team has designed the game level from easy to hard. It also divides the content into sections and correctly inserts it into the game system. The graphic design focuses on reflecting the player's perception of the identity of Lanna food culture, such as colors, characters, sounds, etc., including choosing the right technology and software to develop the game. This result is consistent with research by Angelo, J. et al., (2019). 2) Players can understand the story in the game that is consistent with the play and learning content. The learning objectives are applied with a level of challenge appropriate to the player for the game to convey knowledge effectively. Like the research by Malegiannaki I. A. et al. (2020), which studies cultural teaching

through storytelling within games. Therefore, the digital game design for enhancing cultural heritage should employ a narrative approach to communicate with target audiences. 3) The game can create an enjoyable learning atmosphere and encourage players to be interested in learning about the art of Lanna cooking which is more interesting than broadcast or traditional media. This result is consistent with the hypothesis that Digital games can be an effective tool for promoting the art of Lanna cooking. This is because Players are free to make decisions and feel free to learn and experiment independently (Al-Hunayyan, A. et al., 2018). That is to say, the development of digital games to promote cultures allow users to learn with ease, breaking down the barriers of place and time. The game, with interactive features, also allows users to learn from their mistakes and feel the sense of entertainment at the same time. Being motivated, the game has potential to be part of lessons taught in school and museum exhibitions.

According to the usability assessment of cooking games, most users noted that the methodology adopted in this Lanna cooking game has the potential to be used in-game development for other cultures and provide players with a virtual reality experience. They further stated that if the games are appropriately designed to utilize new technology, along with appropriate amounts of target content and gameplay, this kind of media tends to become successful in preserving local culture as more and more young people use it. This is because games allow players to express their feelings and learn at their pace, which generates more curiosity about their culture. This can also lead to sharing reviews of the game on social media sites, which can be interpreted as a good sign for cultural awareness. However, game designers, undergraduates, culturalists, and those working in related fields should bear in mind that the same type of media cannot equally benefit everyone in society. Familiarity with technology, attitudes toward technology, notions, and preference need to be taken into account.

### **Conclusion Knowledge from Research**

Designing digital games to promote cultural heritage requires knowledge of science and mathematics combined with knowledge of arts and culture. To create interactive, automated media to convey and pass on cultural understanding through play attitude. The game is interdisciplinary creative work that requires collaboration with various co-designers from many fields. Using cultural content as a base to create elements of digital games and put them together effectively promotes Thai culture to Thais and foreigners.



## Contribution

Digital game as culinary training: Digital Lanna Food Games can be considered a digital cooking exercise for food culture learners and teachers. It can be used as supplementary media for teaching in the classroom. It can also be used as a medium for learning outside the school or having fun on your own. In addition, the game can also be used as a public relations medium to attract tourists in the tourism industry.

The guideline for digital game to promote traditional heritance: In terms of cultural heritage, digital game design knowledge can be transferred to game developers or cultural promoters in other regions or cultures to create games for their own culture. This will bring benefits in two aspects: 1) stimulate research in digital games and research on cultural heritage in Thailand; 2) can be used to create games for various cultural content in Thailand. This allows the new generation to learn about Thai cultural heritage through game media. Moreover, it can spread widely to both Thai and foreign tourists.

## Recommendation

This research found the process of designing digital games to promote cultural heritage can be applied to cultural learning and tourism in Thailand

For any further study, a wider range of target audience, such as young children, culinary students, tourists (both Thai and foreign travelers) should be taken into account. Another consideration is that local or traditional clothing, Thai architecture elements can also be applied to the game graphic design for a more extensive cultural promotion. Finally, the objectives of the game can also expand to cover activities in museum tours or sightseeing tours in particular areas.

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