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Original Article

Application of Augmented Reality for the Fostering of Cultural Heritage Preservation of Thai Floral Hanging Garlands

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Abstract *- This study aims to develop an application to the hybrid model with ARCS architecture and Augmented Reality technology to develop reality media of Thai floral hanging garland for motivation to Learn in the online situation. The research results show that the effectiveness of Augmented Reality in online learning about Thai floral hanging garlands by self-learning is a good alternative. Furthermore, gender-based differentials among research participants' perspectives are insignificant. Students were highly motivated to learn the Thai floral hanging garlands according to the ARCS model. In addition, students' opinions are consistent about the Augmented Reality self-learning that is motivation to learn to conserve high-class Thai craftsmanship for university students via reality media.*

Keywords *- ARCS model, Augmented reality, Cultural heritage, Floral hanging, Preservation.*

1. Introduction

Thai floral hanging garlands represent an integral part of Thailand's rich cultural heritage, symbolizing respect, honor, and goodwill in various ceremonies and celebrations. Rooted in centuries-old traditions, embodying the essence of Thai culture and aesthetics. The intricate craftsmanship of Thai floral garlands has been passed down through generations by some of the universities in Thailand, such as Suan Sunandha Rajabhat University, as shown in Figure 1. The outbreak of COVID-19 has vastly impacted the world socially and economically [1]. In Thailand, the educational system was also greatly affected by the pandemic [2]. Many Thai educational institutions have implemented and adapted establishing online learning channels [3]. This significant change in teaching patterns gave rise to distance education and online learning, which facilitated remote learning during the pandemic.

However, distance education still has some disadvantages, such as a lower level of social interaction and commitment compared to face-to-face learning in the traditional classroom [4]. These problems sharply reduce learning motivation and increase dropout rates. Therefore, it is important to integrate modern technology into improving distance education. Nonetheless, the application of digital technology nowadays is still technically problematic, leading to unsatisfactory learning experiences and dramatically increasing dropout rates [5].

Fig. 1 The learner study and practice making the Thai floral hanging garlands in Suan Sunandha Rajabhat University [13]

Schools offering only online courses tend to face dropout problems more than those providing on-site classes [6]. These challenges suggest that distance education cannot simply apply conventional instruction. It requires digital innovations that can proactively motivate learning among students who are trapped in today's online learning environment [7]. For example, some courses use mobile applications that include infographics to summarize content and attract students' attention. However, such methods may not apply to all classes. Both students and teachers from different disciplines are confronting similar issues; for instance, engineering and medical students cannot effectively learn in online laboratory sessions [9]. Many scholars argue that the pandemic opens the window of opportunity for educational institutions to improve their online classrooms in a practical manner and prepare themselves for future changes [10]. Educational institutions should apply digital innovations to fill the gaps in the online learning environment [2].

Nevertheless, it cannot be disputed that virtual classroom is extremely challenging. Especially for Thai traditional craftsmanship, it is difficult to teach students to produce Thai floral hanging garlands towards online learning. Thai floral hanging garlands are a cultural legacy representing the local wisdom and priceless artisanship. To produce these garlands, one must be skillful in delicately selecting and beautifully crafting flowers. The history of Thai floral hanging garlands can be traced back to the Ayutthaya period. Its popularity declined during the second Burmese–Siamese war (1765–1767) and then returned during the establishment of the Rattanakosin Kingdom. In 1792, Jao Jom Manda Thani ('The Royal Mother Thani'), daughter of Chao Phraya Akka Maha Sena (Boon Nak) and concubine of King Rama I, passed down her knowledge in floral hanging garland production to the daughters and descendants of Phra Ong Chao Chat ('Prince Chat') [11].

Later, the popularity of Thai floral hanging garlands peaked in 1868 (during King Rama V's regime) when many royal events featured them. Until now, there have been regular Thai floral hanging garland contests, showing their significance in local arts and crafts. Unfortunately, they are not easily found or learned about outside the Fine Arts Department or the Ministry of Culture. Very few individuals have a chance to closely study them unless there are special occasions or events [12]. It is also challenging to possess Thai floral hanging garlands due to their high prices and the rarity of traditional garland makers. Visiting museums or special events to access them is time and money-consuming, particularly during the COVID-19 pandemic. Thus, many universities now offer traditional Thai arts and crafts as part of their curriculum to inherit and preserve national craftsmanship.

Under the adjustment of education in the pandemic circumstances, distance education is provided to students who live in different locations and even different time zones. The lack of face-to-face interaction must be compensated by a better learning management system [14]. Therefore, problems encountered in online learning are related to the lack of interest or stimulation that helps motivate students to want to study continuously. This study explores the Augmented Reality (AR) combined ARCS model of motivation with learning innovation to improve the learning experiences practically individual self-learning. The hybrid AR innovation and ARCS are expected to fill the gaps in learning by increasing students' motivation to learn about Thai floral hanging garlands on their smartphones for Thai craftsmanship learning and conservation. The learner does not have to pay for purchasing any additional equipment for this learning. For the first time in Thai educational history, their attitudes towards the application of AR technology in Thai flower craftsmanship online learning are evaluated. The outcomes of this study can contribute to a new set of knowledge on Thai craftsmanship online learning at the undergraduate level.

2. Literature Review

Owing to the AR overlays, which allow users to control their virtual environment freely, they can enjoy virtual reality on their smartphones. This increases the popularity of the AR in the field of education. The technology contributes to proactive learning, as it can convert the data into long-term memory units rapidly and effectively [15]. The AR-based instructional materials can enhance the student's engagement in class [16]. In many cases, it can be seen that AR technology can support learning achievements, for example, the application of AR to textbooks in electromagnetism, which proves that students can learn better towards modern technology [17]. AR can provide real-time data for both experienced and non-experienced surgeons to identify the surgical areas, improving their time efficiency [18]. The AR audio projectors and see-through glasses can build an interactive virtual environment and motivate users to improve their physical skills [19]. The AR technology can help users maintain their knowledge and understanding of complex topics, enhance their physical performance, engage in collaboration, lower their anxiety, and achieve higher learning effectiveness [17]. Some chemical engineering students argue that it is difficult to access industrial equipment photos as well as organizational operation guidelines [20]. Not every institution can organize field trips to industrial factories or provide testing equipment to their students, reducing the links between theories and real practice and demotivating students to learn about chemical engineering [21]. Hence, AR technology can improve students' understanding about electronics and electrical engineering [22-23], interior design [24], visual arts [25], heritage education [26], human anatomy [27], vocabulary, and language [27], primary science [28], vocational education and training [29], and information and communication technology [30]. The benefits of AR in the field of education have been widely accepted over recent years [31-36].

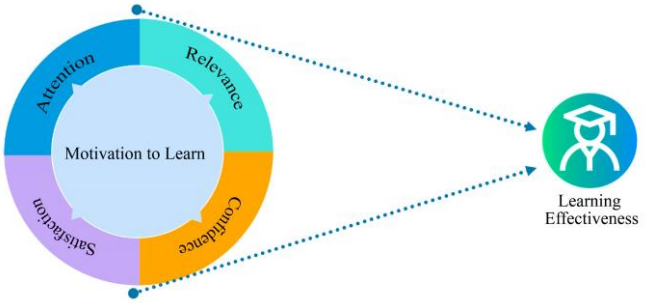

Fig. 2 The ARCS model of motivation to learn

Although AR has been broadly applied in multiple disciplines to increase students' learning motivation, its application to Thai traditional arts and crafts instruction is still rare. The AR can increase students' learning motivation in 4 aspects [36-37]: attention (A), relevance (R), confidence (C), and satisfaction (S), as demonstrated in Figure 2.

The structure of each item portrayed in the ARCS model can imply key dimensions of human motivation from different perspectives, especially in educational contexts [24,36-37]. The model can be applied to enhance learning motivation, accuracy, and endurance [38-40].

The original ARCS model proposed by Keller [41] consists of :
1) attention, which refers to the creation of a stimulus inspiring or motivating the engagement of students in studying towards thoroughly designed technologies such as mobile applications;
2) relevance, which means the positive connection between students' learning experiences and their personal interests or goals [39] including the use of common language to create equal access to instructional media;
3) confidence which is when learners are too afraid of or too confident in learning, possibly leading to the overlook of significant details instead of achieving their goals within the desirable timeframe [37]; and
4) satisfaction which is gained from the constant accomplishments of other three elements, strengthening positive learning experiences towards rewards, self-esteem, and positive interactions with others [42].

The key to success in education is the instantly practical application of a set of knowledge. This can elevate students' satisfaction in learning since they can notice that their time, money, and perseverance worthily contribute to their goal achievements [43].

3. Objective

This study has three overarching objectives, aiming to accomplish the following:

- Development and implementation of AR applications to engage learners and foster a renewed interest in traditional Thai floral hanging garland craftsmanship for preserving Thai cultural traditions.
- To evaluate the differences in the attraction and promote interest in traditional Thai flower garland craftsmanship of students by gender.
- To assess AR's potential to engage learners and foster a renewed interest in traditional Thai floral hanging garland craftsmanship.

4. Methodology

The investigation of AR Thai floral hanging garlands for interactive online learning comprises the following stages:

4.1. Data Gathering Process

The author collects, reviews, and analyzes secondary data obtained from relevant theories and interviews with 5 experts who have experience in making Thai floral hanging garland craftsmanship and previous studies on Thai floral hanging garlands in order to develop the AR multimedia. The designs and components of 9 two-dimensional hanging garland patterns have been evaluated and given recommendations by 5 experts that will be developed for the virtual media suitable for online learning and not difficult to learn by oneself in Thai handicrafts. These 9 two-dimensional garland patterns include Glin Jean, Phat Na Naang, Phat Chamun, Klin Chra Khê', Ban Dai Ngoen, Ban Dai Thong, Glin Takhaeng, Viman Phra, and Ban Dai Kæw [14].

4.2. Analysis and Design Process

The learning objectives are constructed based on the documentary research on the 9 two-dimensional garland patterns. Then, the AR instructional media, such as texts and videos, are designed with the integration of 3D models and AR communication and collaboration tools. Towards smartphones or tablets, students can view the AR images via the QR codes embedded in their online learning resources. The AR Thai floral hanging garlands, can motivate students to learn by increasing attention, relevance, confidence, and satisfaction. This can motivate lifelong learning and enhance online learning effectiveness. The design of the AR instructional media is shown in Figure 3.

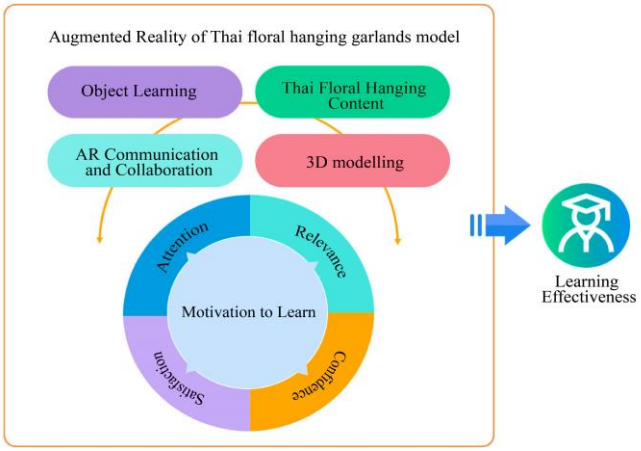

Fig. 3 The hybrid model with ARCS and AR of Thai floral hanging garland for motivation to Learn

The AR design process of the Thai floral hanging garlands aims to develop and emphasize the interactive and dynamic nature of the AR learning experience, which is likely to increase student motivation through QR code accessibility via smartphones. Students can access AR content from a variety of locations. It provides flexibility in the online learning environment and enables learning to take place beyond traditional classrooms. The novelty of AR applications often sparks curiosity and a desire to explore, encouraging active participation in the learning process.

In this segment, the focus will be on a comprehensive system analysis and design using UML diagrams. The current AR design process capitalizes on the advantages afforded by a use case diagram to optimize its functionality, featuring two distinct actors: the 'Admin' and the 'User' representing all users. Within this diagram, five key use cases are depicted, illustrating the diverse ways in which the system functions and interacts.

The actor labeled as ‘Admin’ invokes the use case as follows:

- Create AR model: this use case depicts the case of creating 12 complete 3D models of a Thai flower hanging machine and storing them in the cloud to prepare for retrieval by QR code from users. In the form of a virtual display.
- Navigate AR Features: this use case represents the admin determining the routing link to navigate to AR of Thai floral hanging garland by QR code when the users want to view each Thai floral hanging garland in virtual.
- Create QR Code: this use case depicts the admin creating a QR code representing the link path to view the AR Thai flower hanging machine. It links a digital path leading to each 3D model stored in the cloud system.
- Manage AR: this use case depicts a case where 3D models of 9 Thai flower hanging machines need to be stored in the cloud. Digitally route access through generated QR codes to link access and lead to the display of each type of Thai flower hanging machine in a virtual format through the correct use of a smartphone.

The actor labeled as ‘User’ invokes the use case in the following manner:

- Access AR of Thai floral hanging garland by QR code: this use case depicts the case user’s need to learn about Thai Floral Hanging Garlands in virtual. Users scan QR codes with the Vuforia Unity application installed on their smartphones when they wish to view each individual garland virtually.
- Navigate AR Features: this use case depicts the case of the ability to navigate to the AR representation of Thai Floral Hanging Garlands using QR codes when the user wishes to view each individual garland while learning virtually.

To comprehend the interplay between actors and systems, the use case diagram offers a holistic perspective on the functioning of the system, depicted in Figure 4.

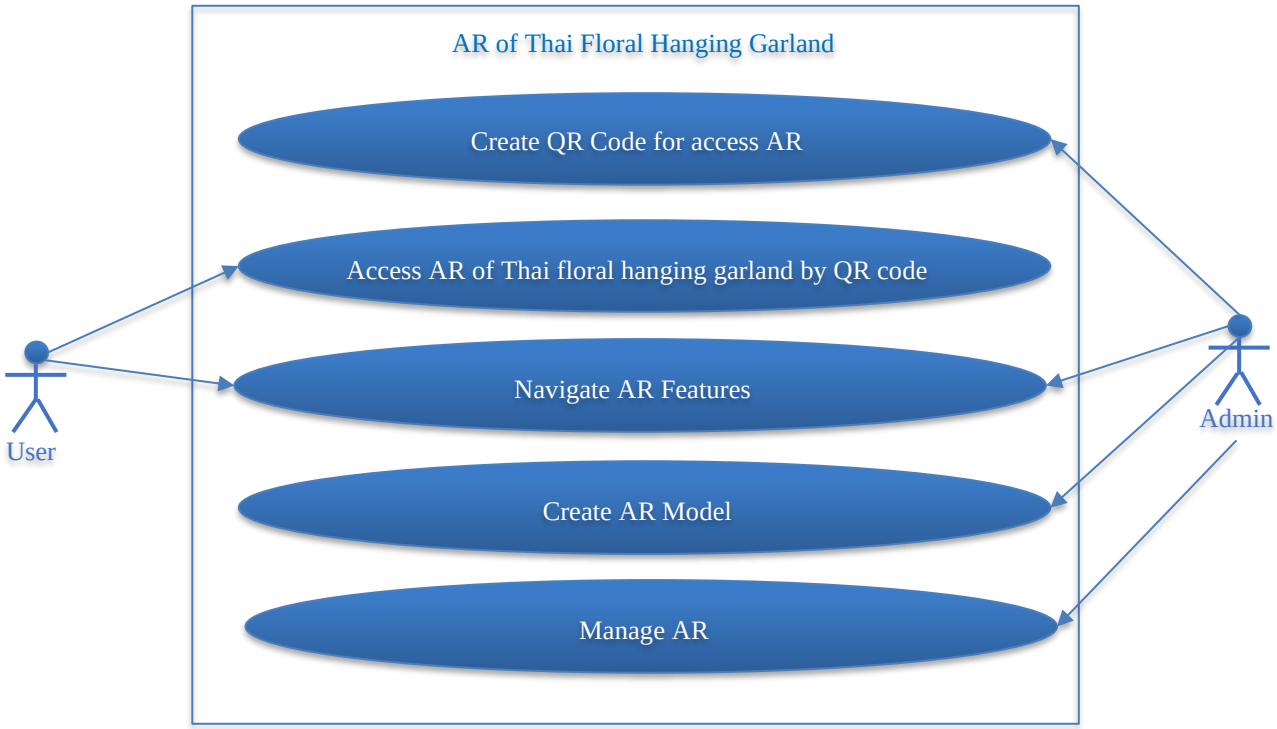

Fig. 4 Use case diagram of the AR of Thai floral hanging garland

4.3. Development Process

The AR framework for Thai floral hanging garlands detailed in this study is depicted in Figure 5.

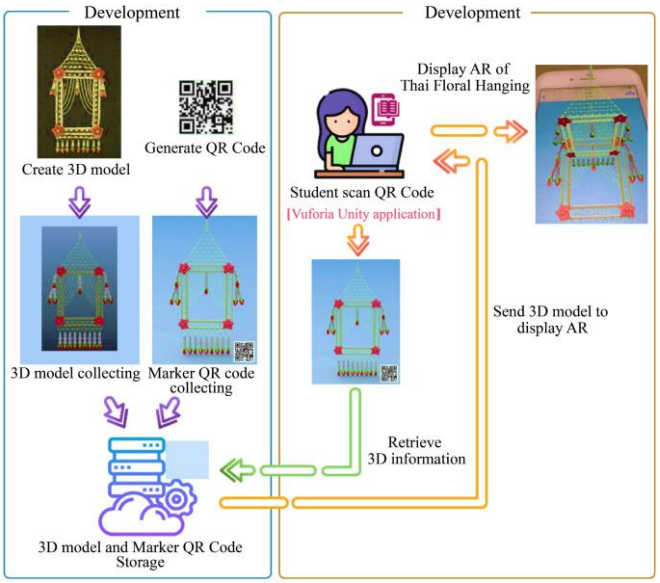

Fig. 5 The framework of AR of Thai floral hanging garland

This framework involves the three-dimensional construction of AR Thai floral hanging garlands, where Each type of garland consists of detailed designs that need to be created in a 3D model, including flowers, layers of a bouquet, and the arrangement garland to the entire hanging garland is meticulously framed and fabricated that the arrangement must follow the shape of the hanging garland in a 3D environment Utilizing Maya, a professional 3D software, the overall of 9 types of AR Thai floral hanging garlands were crafted, as illustrated the example in Figure 6. After that, the 9 of 3D models are securely stored in a cloud database for easy QR code access from users. This work applied Rational Unified Process (RUP) architecture to develop the AR.

To enhance accessibility, each hanging garland illustration incorporates a QR code. These QR codes are presented on a white-background square with distinctive black borders. Serving as markers to identify their locations, these QR codes also function as links to the nine AR Thai floral hanging garlands. Users with iOS or Android smartphones or tablets can install the Vuforia Unity application, which allows users to scan QR codes to use reality apps for Android and iOS systems. By scanning the QR codes, users can seamlessly view the AR Thai floral hanging garlands on their devices.

4.4. Evaluation and Data Analysis Process

Finally, the data is statistically analyzed using the following SPSS functions: percentage (%), mean (M), standard deviation (SD), interquartile range, quartile deviation, and t-test. One hundred twelve questionnaire respondents were randomly selected from a population group who completed the Thai Basic Arts coursework in high school. Therefore, the samples can compare the AR-based lessons with the traditional lessons at the end of the 9-week instruction mentioned in the Implementation stage.

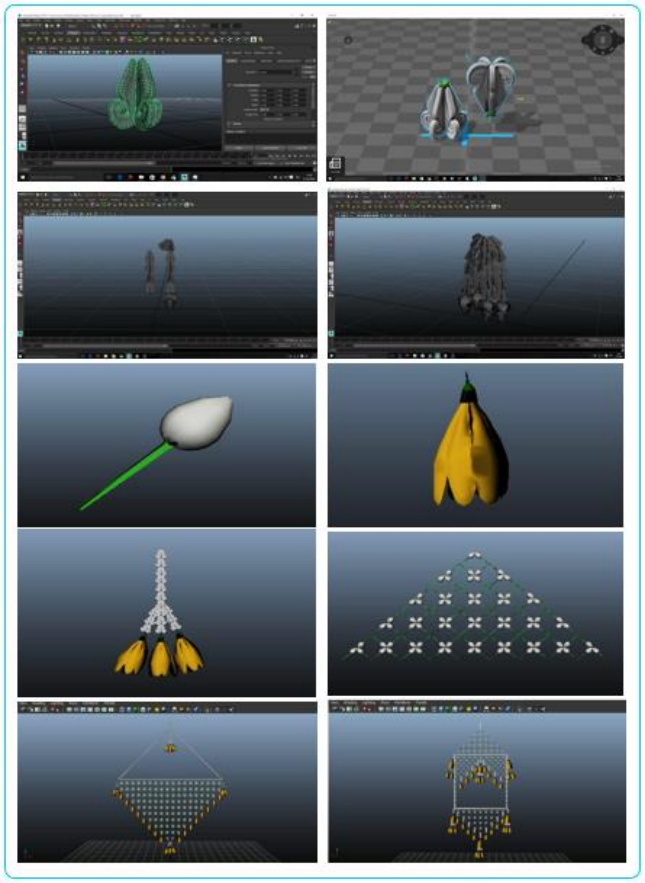

Fig. 6 Example of 3D model of Thai floral hanging garland

The survey is conducted on a voluntary basis. The ethics committee has also approved the study itself. The sample size applied can be compared with other previous studies, which used 50 respondents, 54 respondents, 56 respondents, and 57 respondents [35] [38] [42]. All respondents or participants are aware of the terms and conditions and then sign a cooperation agreement according to ethical principles in research. The studies evaluated the impact of AR multimedia on learning motivation among students.

Data acquisition for this study involved the utilization of an online survey conducted through Google Forms. A 4-point Likert scale was employed to assess the application's effectiveness, where a rating of 1 denoted 'Strongly dissatisfied,' 2 denoted 'Unsatisfied,' 3 denoted 'Satisfied,' and 4 denoted 'Strongly satisfied.' The meaning of rating from 1 to 2 denoted user dissatisfaction, and ratings from 3 to 4 indicated user satisfaction. In addition, this study the data analysis incorporated quartiles, interquartile range, and quartile deviation methodologies. Participants' responses

underwent evaluation utilizing a total scoring of a maximum of 5 again [25-26] to evaluate by percentage (%), mean (M), standard deviation (SD), interquartile range, and quartile deviation.

5. Results

The outcomes from the primary tasks of each ARCS employ the hybrid model combining ARCS and AR, which is aimed at enhancing motivation for learning in the digital era through the utilization of virtual reality technology among online learners. The material concerning Thai floral hanging garland was crafted into AR content and refined based on evaluations from experts in Thai flower craftsmanship education. The results of this development process followed the steps delineated in the ARCS framework, depicted in Figure 7. Users will have the opportunity to view realistic representations of nine variations of Thai floral hanging garlands. By scanning QR codes corresponding to each type that it is positioning adjacent to 2D images of the respective garlands, the system will generate three-dimensional models of the floral hanging apparatus developed in the research, presenting them to the user. A virtual mobile interface will facilitate access to images and accompanying information. The AR showcases the Glin Jean, Phat Na Naang, and Phat Chamun in Figure 8, while Figure 9 features the Klin Chra Khê', Ban Dai Ngoen, and Ban Dai Thong, and Figure 10 presents the Glin Takhaeng, Viman Phra, and Ban Dai Kæw.

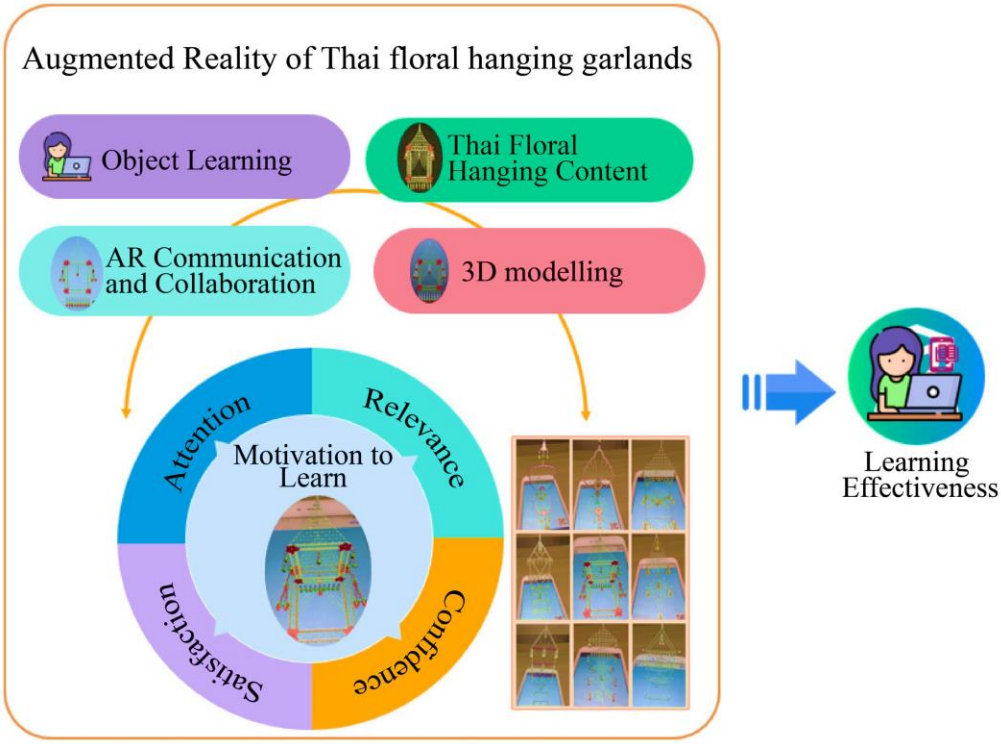

Fig. 7 Overview of the hybrid model with ARCS and AR of Thai floral hanging garland for motivation to learn in the development process

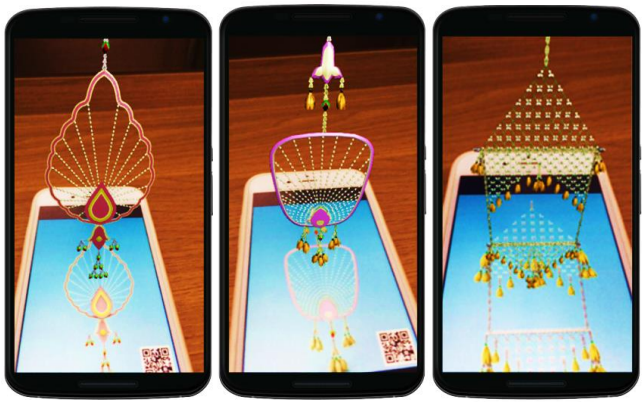

Fig. 8 Display AR of Thai floral hanging garland (Glin Jean, Phat Na Naang, and Phat Chamun)

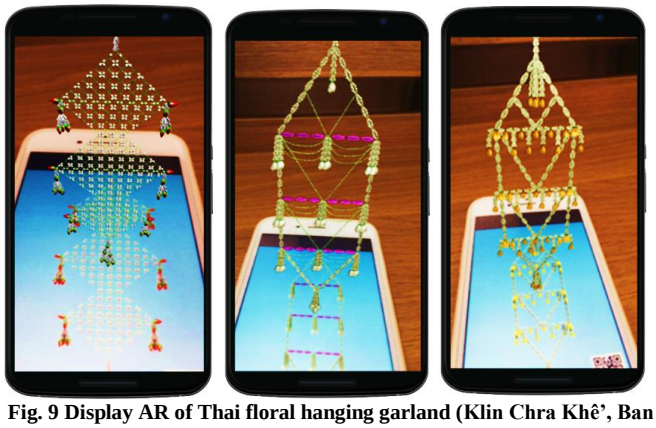

Fig. 9 Display AR of Thai floral hanging garland (Klin Chra Khê', Ban Dai Ngoen, and Ban Dai Thong)

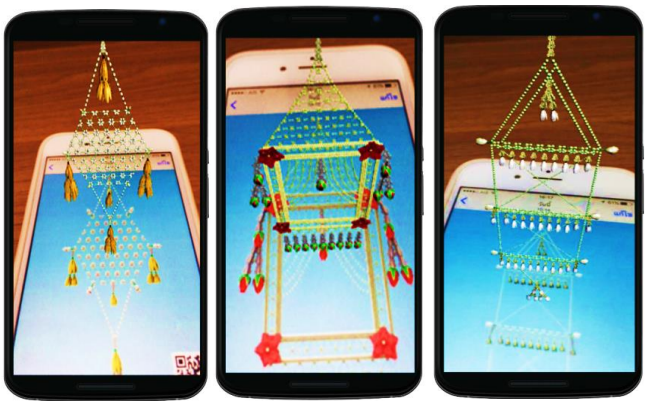

Fig. 10 Display AR of Thai floral hanging garland (Glin Takhaeng, Viman Phra, and Ban Dai Kæw)

The appraising results reference the application based on the ARCS model of learning motivation to develop the questions in the survey (attention: A, relevance: R, confidence: C, and satisfaction: S). The questions are approved by five experts in the field of information technology and Thai floral hanging garlands. The experts evaluate the content validity by using the Index of Item-Objective Congruence (IOC), in which the acceptable level ranges between 0.80-1.00 (80%-100%) for each item. The results found that AR instructional media helped the students to understand the instructional content in a short period of time (R) and allowed them to learn freely (C) (mean = 4.30), indicating 86% to a great extent. It was also found that the AR instructional media could significantly promote self-learning (C) (mean = 4.28), implying 85.60%, as well as students' interest in instructional media (A) (mean = 4.21) revealed 84.20%. This was proved by the fact that the AR instructional media could stimulate students' curiosity in Thai floral hanging garlands (A), and once they had learned about the AR instructional media, they figured out that Thai floral hanging garlands were not boring (R) (mean = 4.20) indicated 84%. In addition, the AR instructional media could enhance students' understanding of Thai floral hanging garlands (R) (mean = 4.19) as 83.80%, which led to a higher level of satisfaction in the study of Thai floral hanging garlands (S) (mean = 4.18) shows 83.60%. Evidently, the AR instructional media was considered a suitable means for teaching the students about Thai floral hanging garlands (S) (mean = 4.17), which showed 83.40%. The overall mean value of the AR instructional media was 4.23, which was 84.60%, shown in Table 1 and Figure 11.

According to the assessment results in Table 1, considering the average values of each key dimension of motivation to learn, it was found that these values were consistent with only slight differences. Confidence (C) had the highest average value at 85.80%, followed by Relevance (R), Attention (A), and Satisfaction (S), with total averages of 84.60%, 84.10%, and 83.50%, respectively. Further, it can be seen that the AR instructional media developed has a score of not less than 4.17 (83.40%) on a 5-point Likert scale (1=Strongly disagree, 2=Disagree, 3=Neutral, 4=Agree, and 5=Strongly agree). This result means that the AR instructional media can motivate students to learn according to the ARCS approach at the Agree level.

Furthermore, the research results showed that there was a high level of agreement in all aspects by which they were rated between the interquartile range of 1 [29] and the quartile deviation of 0.5 [30]. This indicates the positive results of the application of AR to distance/online learning for studying Thai floral hanging garlands.

Table 1. The appraising results reference the application based on the ARCS model of learning motivation

Assessment indicators	Mean	SD	IR	QD	P (%)
1. AR can stimulate students' curiosity in Thai floral hanging garlands (A)	4.20	0.58	1.00	0.50	84.00
2. AR can promote students' interest in instructional media (A)	4.21	0.56	1.00	0.50	84.20
3. AR can enhance students' understanding about Thai floral hanging garlands (R)	4.19	0.53	0.25	0.13	83.80
4. AR can reduce the time needed for studying Thai floral hanging garlands (R)	4.30	0.66	1.00	0.50	86.00
5. AR can prevent boredom in learning about Thai floral hanging garlands (R)	4.20	0.70	1.00	0.50	84.00
6. AR allows students to learn freely (C)	4.30	0.46	1.00	0.50	86.00
7. AR can promote self-learning (C)	4.28	0.70	1.00	0.50	85.60
8. AR is suitable for being used as instructional media for studying Thai floral hanging garlands (S)	4.17	0.57	1.00	0.50	83.40
9. AR can increase satisfaction in the study of Thai floral hanging garlands (S)	4.18	0.57	1.00	0.50	83.60
Overall	4.23	0.60	1.00	0.50	84.60

Moreover, Results of the relevance assessment according to students' learning objectives in using AR teaching media are separated by gender. A survey gauging the relevance and appropriateness of this virtual learning tool was conducted to ascertain its alignment with 3 topics of learning objectives as perceived by students engaged in online learning.

According to the survey results of 112 students, the majority of the 60 respondents (53.57%, comprising 35.71% males and 17.86% females) indicated that the primary learning objective was 'to study.' 45 respondents (40.18%) identified 'self-development' as their learning goal, while 7 respondents (6.25%) cited other objectives, such as 'to conserve.' As depicted in Figure 12, it is evident that most participants chose to take this course for the purpose of the study.

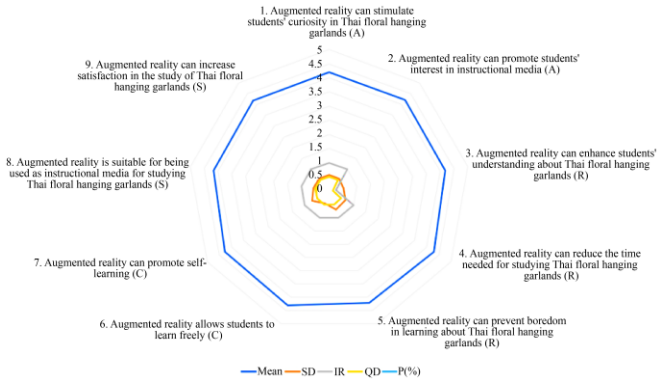

Fig. 11 Comparison of the results applied based on the ARCS model of learning motivation

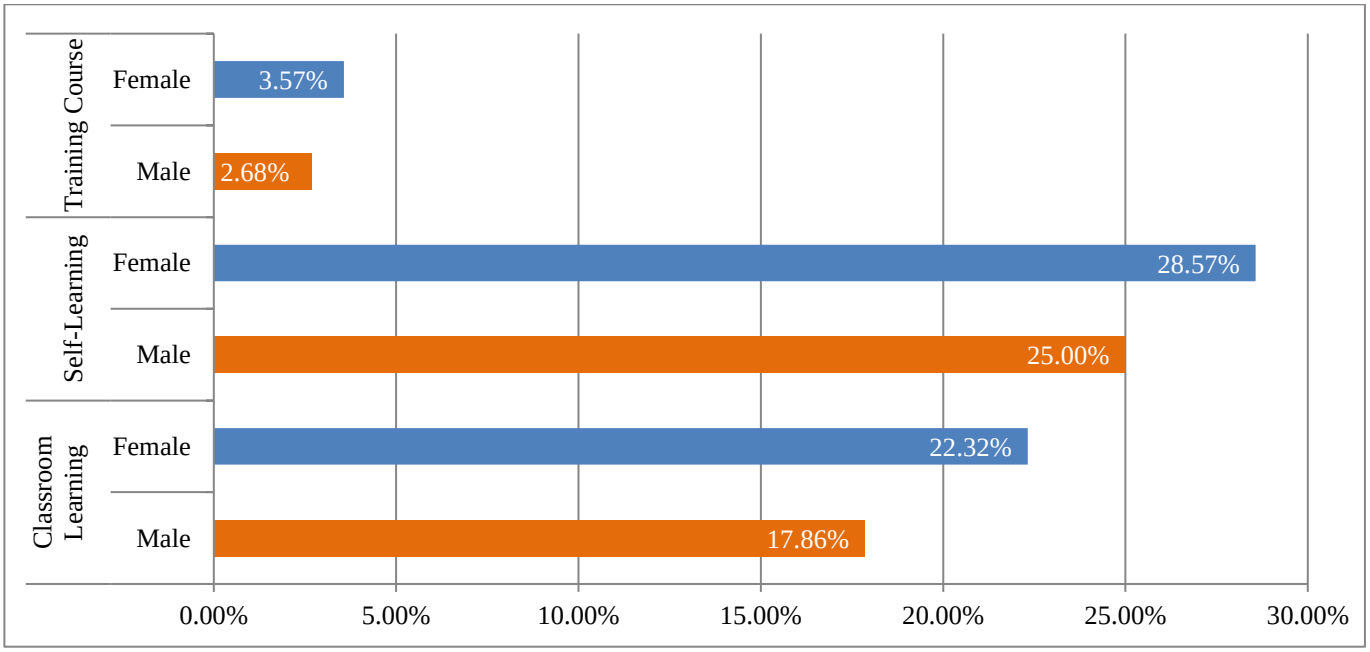

Fig. 12 The evaluation results of students' learning

The comparison between male and female participants in terms of their confidence in AR in online learning of Thai floral hanging garlands is shown in Table 2. The research results suggest that there was no significant difference in opinions between genders (t = 3.0038; p-value > 0.05).

This work assigns a significance level of 0.05. Nonetheless, it was found that the male students (mean = 4.23) had a more positive confidence towards the AR instructional media compared to the female students (mean = 4.21).

Table 2. Confidence of students for the AR Thai floral hanging garland in online learning

Gender	N	Mean	S.D.	df	t	p-value
Male	80	4.23	0.05	3	3.0038	0.057
Female	32	4.21	0.03			

6. Conclusion and Discussion

This research develops the integration of AR in Thai floral hanging garland learning, which proves to be a promising avenue for cultural preservation and education. The study contributes to the discourse on the intersection of technology and traditional crafts, emphasizing the potential of AR as a dynamic tool in revitalizing and sustaining the cultural practices of the research participants in this study. One hundred twelve university students joined the 9-week coursework to learn about Thai floral hanging garlands. Each student de-voted up to 4 hours a day to study online towards real-time broadcasts and other instructional media such as texts, images, and videos available on the university website. The research results show that most students attended the course for the purpose of self-learning about Thai craftsmanship. This self-learning approach can compensate for the real-life experience with tangible hanging garlands.

Nonetheless, it should be noted that there was no significant difference in opinions on the use of AR instructional media between male and female students. Instead, both male and female students had a positive attitude towards the application of AR in online learning. Based on the ARCS model of Learning Motivation, the AR instructional media assessment result was not less than 4.17 (83.40%) and an overall average score of 4.23 (84.60%). Therefore, the AR instructional media could increase students' attention, relevance, confidence, and satisfaction in learning about Thai floral hanging garlands at a high level (Agree level). Clearly, the AR instructional media allowed the students to be more confident in learning when studying alone. More importantly, the AR instructional media could significantly reduce the study time. One final remark regarding the use of AR is the importance of further development in virtual reality instruction. In the future, students are supposed to be able to create Thai floral hanging garlands by themselves in the virtual world. The high AR would allow future generations to learn about Thai traditional arts and crafts more effectively.

To prepare society for future changes, Saleem et al. [11] and Maqableh and Alia [8] suggest that educational institutions should apply digital innovation to non-traditional classrooms [11]. In the modern era, it is indubitable that frequent school lockdowns challenge the educational system due to natural disasters and pandemics. Thus, instructional media must be innovated to facilitate students' learning experiences at all times and places. It should also promote self-learning among independent learners, who are fostered to become intelligent academics. In each learning hour, the instruction process must be designed to enhance students' academic performance [1] and support them to grow up as productive adults.

Students under the distance education circumstances. The teachers should apply digital technology in relation to their social and cultural contexts. Higher education institutions should acknowledge the utilization of digital technology and develop multidisciplinary instructional media in order to educate and nourish their students effectively. Therefore, the application of AR is vital for increasing students' learning motivation in distance/online classrooms using the ARCS model, which can help consider the suitability of AR instructional media to stimulate more interest and curiosity. The technology for learning boosts cognition and increases resistance to stress. This is also a great stepping stone for future generations to reach the advancement of information and communication technology in the field of education. The research findings of this study demonstrate the application of AR instructional media to distance/online learning on Thai traditional arts, which can be further employed in other fields of study for future generations.

Moreover, this research signifies a paradigm shift in the approach to preserving traditional crafts, ushering in a new era where technology complements and enriches cultural education. Further exploration and refinement of AR applications in cultural learning contexts hold the promise of creating a more connected and vibrant cultural landscape that is crucial to increasing motivation in distance education or online learning. For future studies, it is necessary to prove positive learning outcomes in other research environments. The research methods in this study should be repeated in other research projects in order to further develop the virtual environment for online learning of traditional Thai arts.

In future investigations, the researchers intend to explore and develop Virtual Reality (VR) to captivate the interest of younger generations, rekindling their fascination with Thai cultural heritage. Furthermore, a critical avenue for exploration involves delving into the application of machine learning for predictive modeling. This exploration aims to identify key factors among students that significantly contribute to the sustainable preservation and transmission of Thai cultural traditions intricately embodied in Thai handcraft's delicate and profound artistry.

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