

# Open Observing Users to Gain Insight in Lanna Mural Paintings with Responsive Website for Education

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## Abstract

One of the major effects of Covid-19 upon the entire world from December 2019 onwards were the severe restrictions placed upon global and domestic movements. Adhering to lockdown measures, most individuals around the world were unable to travel, either within their own country or abroad. However, during this unprecedented period, the researcher addressed the issue and devised an alternative opportunity for those wishing to visit the temple Wat Phumin in Nan province, Thailand based on previous research. The outcome was funded by the Office of Contemporary Art and Culture (OCAC), Thailand in 2017 to develop Lanna mural paintings and the narratives they depicted into moving images, with the focus on the tales of the Jataka (a body of literature relating to the Buddha's previous lives). In addition to using the findings of previous research in this study, the researcher designed for use the images of Lanna mural paintings and the moving images of the Jataka tales of Khatthana Kumara Jataka and Nimi Jataka in cooperation with responsive websites to gain a better understanding of Lanna mural paintings at Wat Phumin in Nan province through different platforms. In addition, in the context of distance education design, the use of responsive websites to facilitate the exploration and understanding of Lanna mural paintings at Wat Phumin presents a unique and innovative approach. For methodology, open observation and qualitative study were used by interviewing selected participants. This research study has determined that responsive websites are an effective alternative tool for individuals worldwide to explore and deepen their understanding of Lanna mural paintings at Wat Phumin in Nan province. The accessibility of these websites has become especially valuable during a period of limited travel and restricted mobility experienced in recent years. By utilizing responsive websites, visitors can now gain valuable insights into the rich artistic heritage of Lanna mural paintings, transcending physical limitations and geographical boundaries. This educational resource opens up new avenues for cultural exploration and promotes global appreciation of Wat Phumin's remarkable artistic treasures.

**Keywords:** Wat Phumin, responsive website, eye tracking, distance education design, social learning theory

***Pengguna Observasi Terbuka untuk Menambah Wawasan Lukisan Mural Lanna dengan Web Responsif untuk Edukasi***

## Abstrak

*Salah satu dampak besar Covid-19 terhadap seluruh dunia mulai bulan Desember 2019 dan seterusnya adalah pembatasan ketat terhadap pergerakan global dan domestik. Karena penerapan lockdown, sebagian besar orang di seluruh dunia tidak dapat melakukan perjalanan, baik di dalam negeri maupun ke luar negeri. Namun, selama periode yang belum pernah terjadi sebelumnya ini, peneliti mengatasi masalah tersebut dan merancang peluang alternatif bagi mereka yang ingin mengunjungi kuil Wat Phumin*

*di provinsi Nan, Thailand berdasarkan penelitian sebelumnya. Hasil penelitian ini didanai oleh Kantor Seni dan Budaya Kontemporer (OCAC), Thailand pada tahun 2017 untuk mengembangkan lukisan mural Lanna dan narasi yang digambarkannya ke dalam gambar bergerak, dengan fokus pada kisah Jataka (kumpulan literatur yang berkaitan dengan kehidupan Buddha sebelumnya). Selain menggunakan temuan penelitian sebelumnya dalam penelitian ini, peneliti merancang untuk menggunakan gambar lukisan mural Lanna dan gambar bergerak kisah Jataka Khatthana Kumara Jataka dan Nimi Jataka bekerja sama dengan website responsif untuk mendapatkan pemahaman yang lebih baik tentang Lukisan mural Lanna di Wat Phumin di provinsi Nan melalui berbagai platform. Selain itu, dalam konteks perancangan pendidikan jarak jauh, pemanfaatan website responsif untuk memudahkan eksplorasi dan pemahaman lukisan mural Lanna di Wat Phumin menghadirkan pendekatan yang unik dan inovatif. Untuk metodologi, observasi terbuka dan studi kualitatif digunakan dengan mewawancarai partisipan terpilih. Studi penelitian ini menentukan bahwa situs web responsif adalah alat alternatif yang efektif bagi individu di seluruh dunia untuk mengeksplorasi dan memperdalam pemahaman mereka tentang lukisan mural Lanna di Wat Phumin di provinsi Nan. Aksesibilitas situs web ini menjadi sangat berharga selama periode terbatasnya perjalanan dan terbatasnya mobilitas yang dialami dalam beberapa tahun terakhir. Dengan memanfaatkan situs web responsif, pengunjung kini dapat memperoleh wawasan berharga tentang kekayaan warisan seni lukisan mural Lanna, yang melampaui keterbatasan fisik dan batas geografis. Sumber daya pendidikan ini membuka jalan baru untuk eksplorasi budaya dan mempromosikan apresiasi global terhadap kekayaan seni Wat Phumin yang luar biasa.*

**Kata kunci:** *Wat Phumin, website responsif, pelacakan mata, desain pendidikan jarak jauh, teori pembelajaran sosial*

## INTRODUCTION

Covid-19 has had a dramatic effect on people all around the world. One major change has been the lockdown measures with the requirement to stay at home, as well as the fear of many individuals of being stricken by the virus. Together with the imposition of quarantine rules, most individuals were unable to travel as much as they used to, either domestically or abroad. As a result, the researcher created a tool which to some degree helps solve the problem, particularly as regards travelers wishing to visit the temple Wat Phumin in, Nan province, Therefore, the creation of the tool incorporated the findings of previous research, funded by the Office of Contemporary Art and Culture (OCAC) in Bangkok, in 2017 on developing and translating the storytelling of Lanna mural paintings at Wat Phumin, focused on the Jataka, a body of literary work recounting the previous lives of the Buddha, (Khatthana Kumara Jataka and Nimi Jataka).

The purpose of this research was to explore the utilization of previous research findings and a responsive website as a means to enable visitors worldwide to gain valuable insights into Lanna mural paintings at Wat Phumin, especially during a time when travel and entry into Thailand were restricted. Furthermore, this study aimed to address the design considerations for distance education programs, including instructional strategies, technological tools, and learner support mechanisms. In this particular context, the responsive websites played a crucial role

as the primary technological tool, allowing individuals from all corners of the globe to engage with the artistic heritage of Wat Phumin remotely.

As the participants interacted with the website (<http://seewatphumin.icu>) via their smartphones, the researcher observed the pattern of their eye movements through the movement of their fingers touching their smartphone screens. This research used a small focus group, totaling; six participants. As a result, the researcher memorized the position of most of the participant's touches and their eye movements and then analyzed the information.

In conclusion, the results from open observation of the participants supports the assertion that responsive websites employing both photographic and moving images are effective in understanding the narratives of the life of Buddha depicted on the Lanna mural paintings at Wat Phumin in, Nan province.

## **Literature Review**

### **a. Open Observation**

As Parlett & Hamilton, (1972) explain, open-ended observation or open observation is a more modern adaptation of the earlier "Illuminative evaluation". The authors describe the open observation method as being about ethnographic rather than experimental research and methods. Open observation consists of various methods, such as personal observation, video recording, interviews, and questionnaires, with open-ended questions and focus groups being added at a later date and put into a specified method. In addition, this research used small focus groups, or mini-focus groups to collect descriptive data. Krueger & Casey, (2015) suggest the amount of four to six participants is widely accepted because smaller groups are simpler to enlist and accommodate and are more complacent for participants (p.67).

### **b. Responsive Website**

Responsive web design is about creating web pages that work well on all devices. The key point of a responsive web design is their ability to adapt to various screen sizes and viewports. Historically, Ethan Marcotte (2011) describes three existing tools to create a responsive website that always changes to meet the requirements of multiple resolutions: media queries, fluid grids and scalable images (p.11). In addition, Marcotte further encourages new designers to use these three characteristics in creating a responsive site for creating a responsive site for the best performance in the future. He concludes that:

"We can design for an optimal viewing experience, but embed standards-based technologies into our designs to make them not only more flexible, but more adaptive to the media that renders them."

### c. Previous Lives of the Buddha

Originally, the stories that recount Gautama Buddha's former births date back to the pre-Buddhist era in India. The body of literary work has also come to encompass heroic stories as well as short stories conveying the Buddha's teaching. Elizabeth et al. (1972) pointed out the existence of some drawings of the Buddha and his disciples in southern India in the six centuries B.C.E. Centuries later, these stories were collected and recognized by the name Jataka (from Pali and Sanskrit), meaning birth legend (p.15) by the second century B.C.E.

### d. Wat Phumin

Built in around 1596, Wat Phumin is the most famous and ancient royal temple in Nan province. Wat Phumin is a tourist attraction distinguished by being the only building with a cross gable roof, situated behind two nagas. From east to west, the temple building functions as a Phra Viharn, while from north to south it is that of an Ubosot. In 1867, Wat Phumin underwent major restoration during the reign of Phra Chao Ananta Woraritdech, the King of Nan, which was during the same period as the reign of Rama IV, the King of Siam. The major restoration took approximately seven years to finish and included work on the masterpiece paintings on the walls at Wat Phumin by Thit Bua Phan, (Thit means 'former monk'), a Tai Lue painter. Founder of Silpakorn University, Professor Silpa Bhirasri (1959) highlighted Wat Phumin as being home to some valuable mural paintings, and indeed considered them to be among the best in Thailand. While Wat Phumin's mural paintings have certain aspects similar in style to most mural paintings throughout Thailand, they owe their uniqueness to Thit Bua Phan, particularly his subject matter. Thit Bua Phan would present images of particular historical events and the, lifestyle of Tai Lue, the Nan people and hill tribe in his Lanna mural paintings. For example, some images reflect the effect of western influence on Nan during the reign of Rama IV. Thit Bua Phan depicted the image of a sailing ship only at that time seen in Europe and its colonialists. At the time of writing, Wat Phumin is undergoing roof repair, as shown in Figure 1.



**Figure 1** Wat Phumin, Nan province  
Source: Author's personal collection

#### **e. Eye Tracking**

According to Drewes (2010) and Lukander (2003), eye tracking was first used in the 18th century. Arai, and Mardiyanto, (2011); Drewes (2010); Lukander (2003), used the phrase "eye tracking" as it is used in this research to mean the estimation of the user's viewing direction. Most of the time, determining the direction entails locating the subject of the glare. Godfroid (2020) mentions eye tracking is the actual time filing of an individual's eye movement as he or she looks for information on a computer screen. In sum, Singh and Singh (2012) define eye tracking as the practice of monitoring eye movement and identifying the user's point of focus.

#### **f. Distance Education Design**

Distance education has become increasingly prevalent as a flexible alternative to traditional classroom-based learning, allowing students to access educational content and interact with instructors remotely. Designing effective distance education programs requires careful consideration of various components, including instructional strategies, technological tools, and learner support mechanisms. This paper aims to explore the key elements of distance education design, drawing upon relevant literature and websites. In addition, the combination of mobile learning apps and social media platforms, like YouTube in this case, has the potential to expand learning possibilities beyond conventional limits (Cochrane & Narayan, 2020). The effective use of technology should be aligned with the pedagogical goals and the diverse needs of learners (Picciano, 2017).

#### **g. Social Learning Theory**

Bandura, (1977) puts forward social learning theory as a way to describe how people learn from each other through observation, imitation, and modeling. This theory has often been cited as the bridge between behaviorist and cognitive learning theories as it encompasses attention, memory and motivation. In addition, Bandura, (1997) refers to social learning theory as describing human behavior as the continuous interaction between comprehensible, perceptible, and substantial elements.

## **METHODOLOGY**

The present study focused on a custom-built website, which was a responsive website; it allowed users to navigate and explore the contents regarding the Lanna mural paintings at Wat Phumin in, Nan province. The website content comprised two parts: firstly, the images of the entire four sides of the Lanna mural paintings at Wat Phumin; secondly, the visual narrative of the Lanna mural paintings conveying the previous lives of the Buddha that is, the two stories of Khatthana Kumara Jataka and Nimi Jataka., Both of the latter two stories were

animated and uploaded to YouTube. This website allows users to navigate the world via the internet, in case they are unable to visit Wat Phumin in person. This study sought to determine whether any relationship occurs between user actions through the open observation methodology and small focus groups exploring the effectiveness of responsive websites through eye movement-derived parameters. Observed trends provide objective guidance for the use of responsive website usability evaluations.

### 1. Procedures

To facilitate scanning the QR code image associated with the custom-built website, various enhancements have been implemented as figure 2. These improvements aim to optimize the user experience by utilizing advanced scanning technologies and seamless integration with mobile devices. Additionally, to ensure a comprehensive understanding of the users' engagement, the research employed open observation techniques along with other methodologies. The study comprised six mobile users who actively participated in assessing the responsive websites, leveraging eye tracking mobile technology to gain insights into their interactions with the animated images of the Jataka.



**Figure 2** The qr code image associated with the custom-built website  
Source: Author's personal collection

### 2. Participants

Six visitors (aged 17-21; all female) were recruited as participants at Wat Phumin in, Nan province. They were all Thai, but both local and from outside of Nan province. They all owned smartphones as shown in Figure 3.

### 3. Apparatus

The study was conducted using open observation, interviewing, and eye tracking of the participants. As a result, the data about user experience was collected via descriptive means. Eye tracking uses the outline of a circle to represent each of the six participants' eye movements in representing the participant's data.



**Figure 3.** Open observation methodology with the participants at Wat Phumin, Nan Province.  
Source: Author's personal collection

#### 4. Test of the Objectives

To Test the relationship between the custom-built website and the users:

For eye movement on the custom-built homepage, the researcher used eye tracking mobile technology to investigate the user while entering the website, in order to explore how they browse the contents of the website. The results of eye tracking of six participants are presented in Figure 4. Arabic numbers and different colors are paired to represent the eye tracking of the six participants as follows: 1 is purple, 2 is dark blue, 3 is black, 4 is green, 5 is gray, and 6 is red. The eye tracking of the six participants used the outline of the circle to represent each of participant's eye movements. Figure 4 presents the graphic image of Wat Phumin on the right with the upper part containing the various patterns of the outline of the circle all over the image, and on the lower part on the right is the table of the navigation of the webpages' buttons containing the results as in the above image.

The eye tracking of six participants, the graphic image in Figure 5 presents the patterns of the outlines of the different circles and colors with numbers spread out all over a photograph of the north side of the wall of Wat Phumin. The bottom part presents the patterns of the different circles and colors with the numbers focusing on a single home button which used the temple's famous image of Pu Marn Ya Marn as an icon of the home button to link the first page of the website.

Figure 6: eye tracking on four webpages of the links to YouTube, the graphic image reveals the patterns of the different circles and colors with numbers mostly focused on the area of an icon of links to YouTube on the photograph of the north side of the wall of Wat Phumin. In addition, the six participants were told that the beginning of the narrative of the previous lives of the Buddha was in the same position as that in Figure 6. The result

showed the most frequent overlapping of the different circles and colors, because the users were clicking on the icon of the link to YouTube at the same time.

Effectiveness of the animated images of the storytelling of the previous lives of the Buddha on YouTube (Table 4 presents the descriptive information). The moving images of the Jakata tales of Khatthana Kumara Jataka and Nimi Jataka on YouTube obtain 13 files. With the open observation methodology, the researcher recorded the users touching of the icons with links to YouTube via the users' eye tracking. The researcher told the six participants about the position of the initial story of the Jakata tales of Khatthana Kumara Jataka and Nimi Jataka, then all the eye tracking of the six participants focused on the single positions as shown in Figure 6. In addition, to answering questions about the effectiveness of the moving storytelling images of the Jakata on YouTube (see Figure 7), the researcher used a questionnaire in which the six participants described their satisfaction with interacting with the website. Table 4 presents the participants experiences on the effectiveness of the moving images on YouTube. The comments of two participants are particularly worth noting. Participant no.5. described her experience, by commenting on the accessibility, that anyone can click on the link to the story on YouTube and acquire the relevant knowledge. Participant no.6. described her experiences on browsing the website, commenting that this website encourages people to acquire knowledge about the Wat Phumin mural paintings. Moreover, she added that this website is an important component of the bigger plan for managing cultural resources.

## 5. Responsive Web Design

HTML and CSS are used to rescale, conceal, decrease, increase, or move the content.

Three examples of the CSS and HTML responsive design of <http://seewatphumin.icu> are as follows:

1. Responsive Web Design – The Viewport (see Table 1)
2. Responsive Web Design – Grid-View (see Table 2)
3. Responsive Web Design – Media Queries (see Table 3)



**Table 1** The viewport of <http://seewatphumin.icu>

```
<meta name="viewport"
content="width=device-
width, initial-scale=1.0">
```

**Table 2** CSS Box Sizing of <http://seewatphumin.icu>

```
* {
box-sizing: border-box;
}
```

**Table 3** Media Queries of <http://seewatphumin.icu>

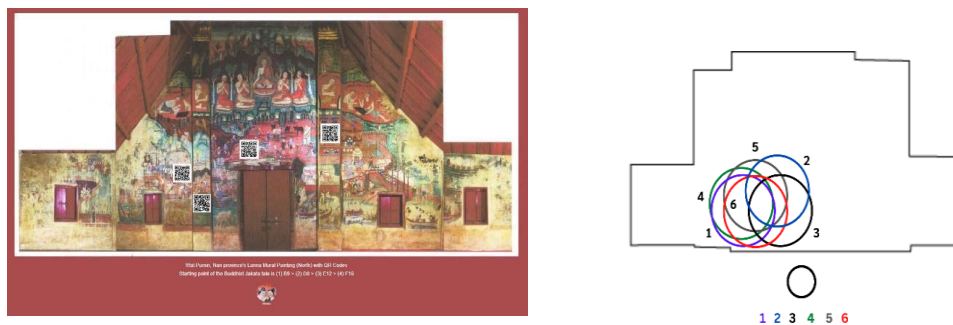
```
@media only screen and
(max-width: 600px) {
body {
background-color:
#337ab7;
}
}
```



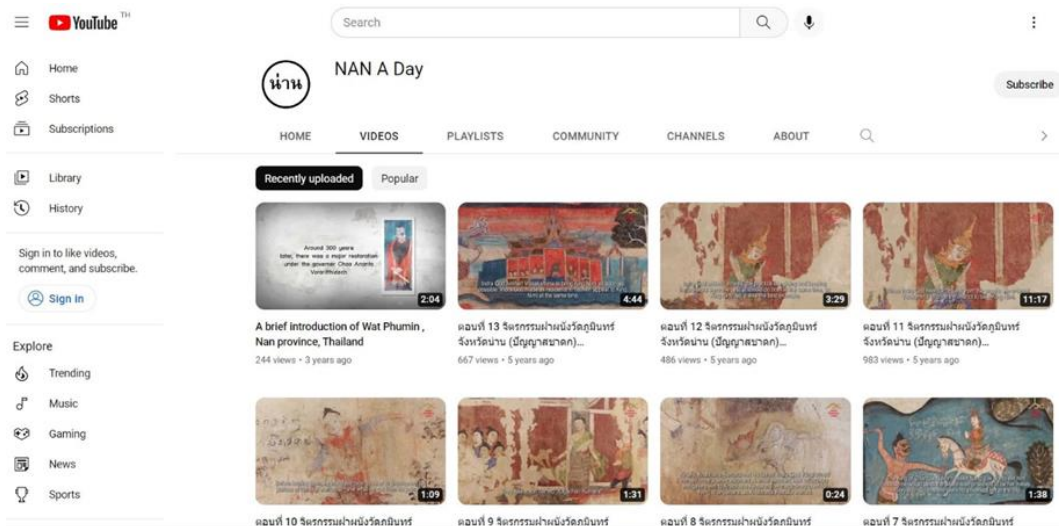
**Figure 4.** Home Page of <http://seewatphumin.icu>  
(web page layout, left and the eye tracking, right)  
Source: Author's personal collection



**Figure 5.** The Photograph of North side of Lanna mural painting on Web Page (<http://seewatphumin.icu>) (web page layout, left and the eye tracking, right)  
 Source: Author's personal collection



**Figure 6.** The Photograph of North side of Lanna mural painting on Web Page (<http://seewatphumin.icu>) with Icon links to *YouTube* (web page layout, left and the eye tracking, right)  
 Source: Author's personal collection



**Figure 7.** *YouTube* contains the moving images for the storytelling of the Jakata tales of Khatthana Kumara Jataka and Nimi Jataka  
 Source: Author's personal collection

**Table 4** Descriptive Information

ID	Gender	Age	Home town	Mobile Model	Display Size (Diagonal)	Observation Title	Descriptive insights
1.	Female	21	Chonburi	Oppo Reno 5 5G	175.2 mm	Searching information	Can see all around, if you want to see any direction, you can click to see. Good detail pictures It's complicated to use. Image used.
2.	Female	21	Chonburi	iPhone 11	168.8 mm	Exploring the Lanna mural paintings	Can see more around, see more real pictures, look around and see the difference more. have more free space, easy to use and foreigners can understand even though they are not Nan people. It is convenient to use.
3.	Female	21	Bangkok	iPad Pro	305.2 nm	Examining the website	There are interesting and convenient features. The web page is beautiful. It is very useful to use. The website is not eye-catching.
4.	Female	21	Chonburi	Galaxy A50 S	175.1 nm	Inspecting personal device	Easy to use, answering questions, depending on the internet
5.	Female	17	Nan	iPhone 7	153.7 nm	Probing the Storytelling	You can click to see the link. Makes knowledge easier is a collection of knowledge

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6.	Female	21	Nan	Vivo Y71i	173.3 nm	Browsing the website	Promote the dissemination of information about the mural paintings of Wat Phumin. It is part of the cultural resource management approach.
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## RESULTS AND DISCUSSION

The average age of six participants is 20 years. This finding coincided with the prediction of Smith (2015) the rise of the amount of mobile or smartphone was expanding at an exponential rate. He reported that the majority of mobile owners are 18 years old and older. In addition, Lefebvre (2009) suggests that currently 60% of all Internet connections worldwide come from smartphones. The activities such as regular phone calls, text messaging, internet browser, and multimedia services, etc. become convenient for the users. Truthfully, smartphones can serve as a computer, and it is easy to carry to any place. As a result, the mobile device is suitable for the tasks in this study, because all six participants owned smartphones as the data of their types and screen sizes of their smartphones. shown in Table 4.

## CONCLUSION

The outcome of this study demonstrates the effectiveness of utilizing a responsive website as an alternative tool for individuals worldwide to learn more about Lanna mural paintings at Wat Phumin, Nan province, particularly during the challenging period of the COVID-19 pandemic. The integration of distance education design principles and the use of responsive websites have proven instrumental in achieving the research objectives. In addition, Bandura's social learning theory (1977) was applied in this study to analyze the relationship between responsive websites and their users. The theory suggests that people learn by observing the actions, attitudes, and consequences experienced by others. By incorporating this theoretical framework, the research explored how individuals engage with the responsive websites and how their learning experiences are influenced by the interactive nature of the platform. As a result, six participants gave a good representation of their generation in terms of lifestyles and acquaintance with the development of technology such as smartphones Looking ahead, once the COVID-19 pandemic subsides, the researcher envisions the emergence of even more remarkable creations on responsive websites that facilitate the learning of arts and culture content. This advancement would enable individuals from any part of the world to access and explore artistic treasures through various platforms and from any location. The potential of responsive websites in distance education design holds great promise for fostering global cultural exchange and

appreciation, transcending physical barriers and allowing for continuous learning and exploration.

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## REFERENCES

- Arai, K., & Mardiyanto, R. (2011). Eye-based HCI with full specification of mouse and keyboard using pupil knowledge in the gaze estimation. [Proceeding]. *2011 Eighth International Conference in Information Technology*, p. 423-428. New Generation.
- Bandura, A. (1977). *Social learning theory*. New York: General Learning Press.
- Bandura, A. (2020, September 14). *Social learning theory (Bandura)*. Learning-Theories.com. Retrieved July 15, 2023 from <http://www.learning-theories.com/social-learning-theory-bandura.html>
- Bhirasri, S. (1959). *Appreciation of our murals*. Bangkok, Thailand: Fine ArtsDept.
- Cochrane, T., & Narayan, V. (2020). Critical success factors for mobile learning in higher education: A multi-year case study. *Australasian Journal of Educational Technology*, 36(4), 97-116.
- D. Miller, B. (2022). *Principles of web design*. Allworth.
- Drewes, H. (2010). Eye gaze tracking for human computer interaction. [A Dissertation submitted in the partial fulfilment of the Ph. D. Degree], Ludwig-Maximilians-University of Munich. [www.ndltd.org](http://www.ndltd.org)
- Godfroid, Aline. (2019). *Eye tracking in second language acquisition and bilingualism: A Research synthesis and methodological guide*. 1st ed., Routledge.
- Kadlec, T., & Gustafson, A. (2012). *Implementing responsive design building sites for an anywhere everywhere web*. New Riders Publishing.
- Krueger, R. A., & Casey, M. A. (2015). *Focus Groups: A practical guide for applied research*. SAGE.
- Lefebvre, C. (2009). Integrating cell phones and mobile technologies into public health practice: A social marketing perspective: Social marketing and health communication. *Health Promotion Practice*, 10(4),490-494. Retrieved 15 July 2023, from <http://dx.doi.org/10.1177/1524839909342849>.
- Lukander, K., (2003). Mobile usability - Measuring gaze point on handheld devices. [Master's thesis]. In *2011 Eighth International Conference in Information Technology: New Generation*. Retrieved July 15, 2023 from [www.ndltd.org](http://www.ndltd.org)

- Marcotte, E. (2011). *Responsive web design*. A Book Apart.
- Parlett, M.R. & Hamilton, D. (1972/77/87) "Evaluation as illumination: a new approach to the study of innovatory programmes". (1972) workshop at Cambridge, and unpublished report Occasional paper 9, Centre for research in the educational sciences, U. of Edinburgh.
- Picciano, A. G. (2017). Theories and frameworks for online education: Seeking an integrated model. *Online Learning*, 21(3), 166-190.
- Pruitt, J., & Grudin, J. (2003). *Personas: Practice and theory*. microsoft. Retrieved August 19, 2022, from <https://www.microsoft.com/en-us/research/wp-content/uploads/2017/01/personas-practice-and-theory.pdf>.
- Smith, A. (2015). U.S. *Smartphone use in 2015*. Pew research center: Internet, Science & Tech. Retrieved July 15, 2023, from <https://www.pewresearch.org/internet/2015/04/01/us-smartphone-use-in-2015>.
- Tourism Authority of Thailand. (n.d.-b). Wat Phumin. Tourism Authority of Thailand. Retrieved August 10, 2022, from <https://www.tourismthailand.org/attraction/wat-phumin>.
- Wray, E., Rosenfield, C., Bailey, D., & Wray, J. D. (1972). *Ten lives of the buddha: Siamese temple painting and Jataka Tales*. Weatherhill.