

The Development of Digital Content in the Metaverse Combined with Participatory Communication and Learning with Religious Leader to Enhance Students' Perception of the Community Mosque

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Abstract

As a lot of juvenile Muslims tend to be less engaged with their religion and the history of mosques in their community, this study was conducted to develop a series of digital content in the metaverse combined with participatory communication and learning with religious leader to enhance students' perception of community Mosque (Darun Naim, Thung Kru District, Thailand). The objectives of this research were to survey needs, to develop and assess the quality of the aforementioned series of digital content, to evaluate students' perception, and to measure students' satisfaction. Materials of this study included questionnaires and forms to survey needs, assess the quality of the digital content and media presentation, evaluate subjects perception, and measure their satisfaction. A total of 30 subjects who were students from Al-Bidayah Religious School, Thung Khru District, Bangkok and had been members of Young Muslim Association Ban Khru for at least 1 year were selected through purposive sampling. After questionnaire-based data collection, mean and standard deviation were used as a statistical tool for data analysis. The results of this study showed that the outcome of needs assessment was at a high level. The overall quality of the content and media presentation was at a good and very good level, respectively. The findings of the assessment of students' perception and satisfaction were at the highest level. In summary, the developed digital content in the metaverse combined with participatory communication and learning with religious leader was of high quality and can be implemented.

Keywords: digital content, metaverse, participatory communication, learning with religious leader, community mosque

1. Introduction

Digital content refers to any content that exists in the form of digital data using any digital tools, such as computer, communication tools (Anantasook.com, 2016) to present the content. The Office of the National Economics and Social Development Council (2002) stated that digital content covers animation, games, e-Learning, CAI, mobile content, web design (Trade Policy and Strategy Office, 2019). In 2020, overall digital content market in Thailand expanded approximately 26.55% in average with the value of 39,332 million baht (Thaipost, 2021). Public relation is a communication process from an organization to its publics. This also includes listening to their opinion and consensus towards the organization with an aim to build trust, corporate image, knowledge, and to correct mistakes (Sawatampairuk, 2022). The importance of public relations is creating knowledge and understanding among people (Kosumsom & Malison, 2013). Through participatory communication as a means to make change and improve communication skills for individuals/groups of people. Participatory communication is an approach that requires interaction between a receiver and an information source through a communicator who facilitates conveying information to people. In other words, the communicator plays a role as a mentor for people in a community.

Currently, with a total of almost 1,600 million Muslims or approximately 23% of world population in 2010, Muslims hold the world's second-largest religious population following Christians. As Muslims are a group of people with the highest expansion rate, it is estimated that there will be almost 2,800 million Muslims or around 30% of world population by 2050. This is similar to the estimated number of Christians which is around 2,900 million people in the same year (Exim News, 2015). There is evidence indicating interaction between Thailand

and countries dominated by Muslims since Ayutthaya Empire. Due to trade relations between Thailand and Persian Empire, Persians moved in and settled down in Thailand to trade and serve the government especially in the era of King Narai the Great. Through Thonburi and Rattanakosin Kingdom where Bangkok was established as the capital city of Thailand, it was the center of the region where a number of Muslims from several countries traveled to. These Muslims also had opportunities to serve and help the Thai government develop the country especially in Bangkok and its vicinity where communities of Muslims were established, such as Warrior Community at Ban Krua Mosque, Craftsman Community at Chakraphong Mosque, Goldsmith Community at Tuk Din Mosque, and Agricultural Community at Sai Kong Din Mosque. Aside from the central Thailand, Pakistani, Indian, and Chinese Muslims also immigrated to the north of Thailand whereas the south of Thailand was originally dominated by Malayu Muslims (Thai Encyclopedia for Youth, 2014)

Around 1897, two Muslim families immigrated to Thailand and settled down next to Khru canal which was a boundary line separate Thung Khru sub-district, Ratburana district, Thonburi province from Bang Khru sub-district, Phra Pradaeng district, Samut Prakan province. This community where almarhum To Gi Ta, the ancestor of Thongta family and almarhum To Gi Deng, the ancestor of Boonma family settled down was called Ban Khru or Thung Khru. Since there were not a lot of people in the beginning, a place called 'Balae' was built for religious activities, such as praying and teaching. For Friday and Sunnah prayer took place in Daros Adah Mosque, Ban Pak Lad, Phra Pradaeng district, Samut Prakan province. Until 1902, as the number of relatives in both families drastically increased and a number of people moved into the area, Darun Naim Mosque was then constructed (Chalerm Raj Cultural Center, Muslim Community of Pak Lad, 2022). Sangmarn, the leader of Young Muslim Association Ban Khru (Sangmam, 2023) explained that several adults and children lack knowledge and understanding about the history of their community as well as mosques in their area and tend to be less engaged with their religion. This results from lack of proper education due to poverty.

Based on what mentioned above and relevant studies by Hongthong (2011), Diyen et al. (2021), Peekeaw et al. (2020), Mateeboonviriyakul et al. (2016), and Patsarathorn and Thamwipat (2016), it was observed that a series of digital content to promote a Mosque has never been developed before. Therefore, the research team focused on developing a series of digital content in the metaverse describing the history of Darun Naim Mosque (Thung Khru) and Ban Khru community and using that as a public relations or learning tool to enhance adolescents' perception of community Mosque. This was conducted in combination with participatory communication activity with religious leader in order to encourage the children to exchange with the religious leader and familiarize them with their religious.

2. Literature Review

Digital content refers to materials like images, graphics, and video clips. They are the major component today that draws buyers' attention. The major purposes of digital content are to establish credibility, deliver truthful content, and provide value to an audience with a defined target demographic. Because they can be provided to the target audience to increase efficacy and satisfy their needs, high-quality articles are advantageous (Bell, 2020).

Online media is a platform that facilitates information sharing from senders to receivers through online network. Interaction between senders and receivers or among receivers can occur on online media. Online media can be categorized into several types, but the most commonly used ones include Blog, Twitter and Microblogging, Social Network, and Media Sharing. In this study, the Facebook page called Bankru Muslim Youth and in the metaverse with spatial.io was utilized (Wijitboonyarak, 2011).

Metaverse as per the classical model of communication, can be viewed as a spatial internet where space media serves as a means of connecting with individuals on earth, particularly those relying solely on television for communication. Unlike the traditional internet, the distinguishing feature of the metaverse is the placement of "things" or user-generated content, mirroring the real world. Consequently, the metaverse emerges as a spatial internet. In summary, the Metaverse stands out as an exciting and innovative communication tool with the capability to revolutionize our communication methods. It has the potential to reshape how people interact and communicate by offering a spatial and immersive online environment (Alawaad et al., 2022).

Participatory communication and learning refers to a mechanism and tool that make change and improve communication skills for individuals/groups of people. It is an approach that requires interaction between a receiver and an information source through a communicator who facilitates conveying information to people. In other words, the communicator plays a role as a mentor for people in a community. The researcher took part in this study as a communicator between religious leader and the audience on Facebook page livestream (Huachiew Chalermprakiet University, 2022).

Public relation is a communication process from an organization to its publics. This also includes listening to their

opinion and consensus towards the organization with an aim to build trust, corporate image, knowledge, and to correct mistakes which, in this study, is to encourage people in the community to learn and understand the background and religious activities of Daru Naim Mosque (Thung Khru) (Sawatampairuk, 2022).

ADDIE Model is a process used for the development of instructional design commonly used by learning designers, instructional designers, and training developers. The model consists of five steps including analysis, design, development, implementation, and evaluation. Although each step of the process is flexible and effective for the development of learning content, all five steps were used in this study in order to design and produce the content (Chusangnil, 2012).

The objectives of the study:

- 1) To survey the students' needs of media and activity.
- 2) To develop and assess the quality of the digital content in the metaverse combined with participatory communication and learning with religious leader to enhance students' perception of community Mosque.
- 3) To evaluate the students' perception of the developed digital content in the metaverse combined with participatory communication and learning with religious leader enhances students' perception of community Mosque.
- 4) To measure the students' satisfaction towards the developed digital content in the metaverse combined with participatory communication and learning with religious leader to enhance students' perception of community Mosque.

3. Method

3.1 Scope of Study

The researcher determined the scope of content and presentation based on the needs assessment as follows:

- 1) Various perspectives towards Darun Naim Mosque
- 2) The background of Darun Naim Mosque in Thung Khru District
- 3) The history of Ban Khru community
- 4) Main religious activity

3.2 Population

Target population was a total of 100 students from Al-Bidayah Religious School, Thung Khru District, Bangkok and had been members of Young Muslim Association Ban Khru (Anis Sangam, 2023)

3.3 Sampling group

A total of 30 students from Al-Bidayah Religious School and had been members of Young Muslim Association Ban Khru in the association for at least 1 year were selected as the subjects of study through purposive sampling method.

3.4 Experts

Experts who assessed quality of the developed digital content for online media were those who hold a Bachelor's degree with at least five-year experience in digital content design. This included three experts in learning content, three experts in media presentation, and three experts in measurement and evaluation.

3.5 Variables in the Study

The demand of students towards a series of digital content in the metaverse combined with participatory communication and learning with religious leader to enhance students' perception of community Mosque.

3.6 Independent Variables

Digital content in the metaverse combined with participatory communication and learning with religious leader to enhance students' perception of community Mosque

3.7 Dependent Variables

- 1) The quality of digital content developed in the metaverse combined with participatory communication and learning with religious leader to enhance students' perception of community Mosque
- 2) The students' perception of the digital content developed in the metaverse combined with participatory communication and learning with religious leader to enhance students' perception of community Mosque

3) The students' satisfaction towards digital content developed in the metaverse combined with participatory communication and learning with religious leader to enhance students' perception of community Mosque

3.8 Materials

Materials utilized in this study passed the evaluation of IOC with the value between 0.7-1.00 as well as the evaluation of research ethics in human. These materials consisted of:

- 1) A questionnaire to survey the students' needs of media and activity.
- 2) Digital content developed in the metaverse combined with participatory communication and learning with religious leader to enhance students' perception of community Mosque.
- 3) An evaluation form to assess the quality of digital content and media presentation.
- 4) An evaluation form to assess the study students' perception of the developed digital content and combined with activity and learning through 80 min Zoom meetings.
- 5) An evaluation for to measure the students' satisfaction towards the developed digital content and combined with activity and learning through 80 min Zoom meetings.

3.9 Data Analysis

Mean and standard deviation (S.D.) were used as a statistical tool for data analysis with the following interpretation criteria (Krupee, 2009).

4.51 - 5.00	means	very good/the highest
3.51 - 4.50	means	good/high
2.51 - 3.50	means	moderate/neutral
1.51 - 2.50	means	fair/low
1.00 - 1.50	means	poor/very low

4. Results

4.1 The Results of Needs Assessment in the Students

Tables 1. The results of needs assessment in the students

Topics of assessment	Results		
	\bar{x}	S.D.	Level of need
1. Types of desired media combined with activity and learning			
1.1 Video clip in the metaverse combined with participatory communication and learning with religious leader	4.43	0.68	High
1.2 Infographics in the metaverse combined with participatory communication and learning with religious leader	4.57	0.63	The highest
Average	4.50	0.65	High
2. Content aspect			
2.1 Various perspectives towards Darun Naim Mosque	4.50	0.57	High
2.2 Background of Darun Naim Mosque	4.70	0.53	The highest
2.3 History of Ban Khru community	4.67	0.61	The highest
2.4 Main religious activities	4.57	0.50	The highest
Average	4.61	0.55	The highest
3. Visual aspect			
3.1 Using real images with graphics in the developed media	4.57	0.68	The highest
3.2 Using vibrant and soothing images/graphics	4.70	0.47	The highest
3.3 Visual equipped with description	4.57	0.57	The highest
Average	4.61	0.57	The highest
4. Audio aspect			
4.1 Voiceover is clear/easy to understand	4.70	0.53	The highest
4.2 video is accompanied by music	4.03	1.10	High
4.3 The video includes various sound effects	3.87	0.86	High

Average	4.20	0.93	High
Overall average	4.49	0.70	High

According to Table 1, the overall average of what the students desire in each aspect (including types of desired media, content, visual and audio) of the media was at 4.49 which was considered high level of need based on the interpretation criteria above ($\bar{x}=4.49$, S.D.=0.70). The highest level of need was observed in the content and visual aspect ($\bar{x}=4.61$, S.D. = 0.55, and $\bar{x}=4.61$, S.D. = 0.57) respectively, followed by high level of needs for types of desired media combined with activity and learning ($\bar{x}=4.50$, S.D. = 0.65) and audio aspect ($\bar{x}=4.20$, S.D. = 0.93). The results from the needs assessment were then used to develop a series of digital content in the metaverse combined with participatory communication and learning with religious leader to enhance students' perception of community Mosque (Darun Naim).

4.2 The Outcomes of a Developed Digital Content in the Metaverse Combined with Participatory Communication and Learning

1) A series of digital content combined with participatory communication and learning with religious leader on social media to promote Darun Naim Mosque in a video clip



Figure1. An example of the 5.38 min video showing an interview of 4 juveniles

2) A series of digital content combined with participatory communication and learning with religious leader in the infographic posters



Figure 2. The posters infographic developed

3) A series of digital content combined with participatory communication and learning with religious leader in the infographic posters and a video clip in the Metaverse

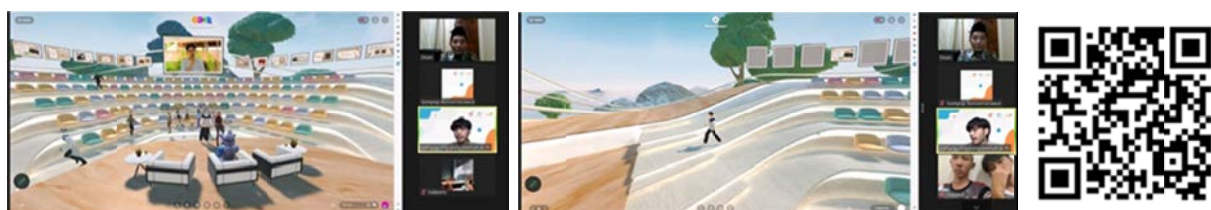


Figure 3. An example of infographic posters and video clip in the Metaverse developed

4) Participatory communication and learning with religious leader to enhance students' perception of community Mosque (Darun Naim).

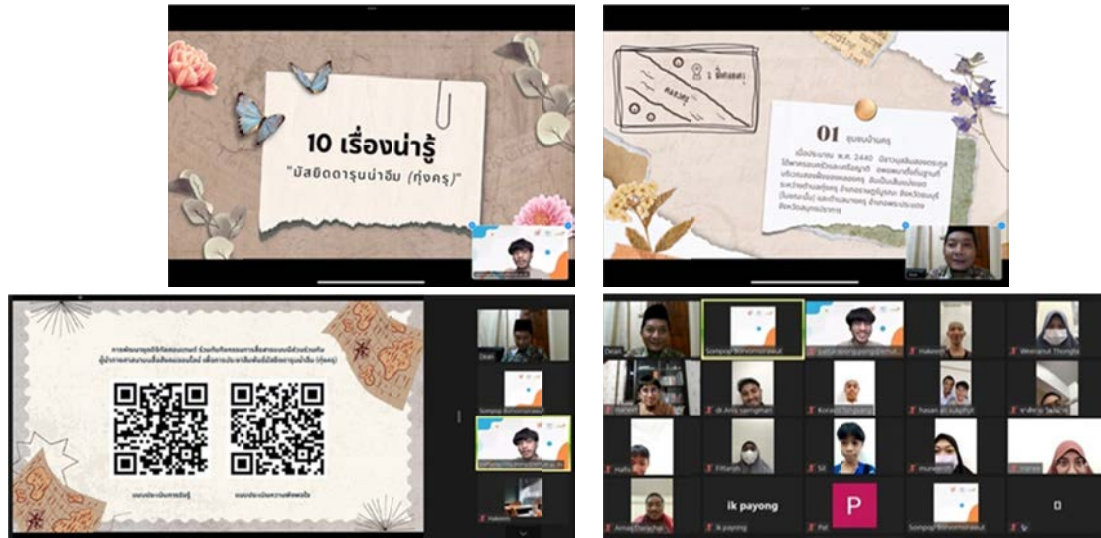


Figure 4. Participatory communication and learning with Bilan, religious leader, through 80 min Zoom meetings

4.3 The Quality Assessment of the Digital Content Combined with Participatory Communication and Learning

Table 2. The results of quality assessment of the content and media presentation of the developed digital content in the metaverse combined with participatory communication and learning by experts

Topics of assessment	Results		
	\bar{x}	S.D.	Level of quality
1. Results of the evaluation of content quality by content experts	4.33	0.70	Good
2. Results of the evaluation of media presentation quality by media presentation experts	4.70	0.47	Very good

According to Table 2, the overall evaluation of the developed digital content in the metaverse combined with participatory communication and learning with religious leader was at a good level of quality ($\bar{x} = 4.33$ and S.D. = 0.70). In addition to the content, it was observed that the quality of media presentation of the developed series of digital content was at a very good level of quality ($\bar{x} = 4.70$, S.D. = 0.47).

4.4 The Results of Perception Assessment in the Students

Table 3. The results of perception assessment in the students

Topics of assessment	Results		
	\bar{x}	S.D.	Level of perception
1. Various perspectives towards Darun Naim Mosque	5.00	0.00	The highest
2. Background of Darun Naim Mosque	4.65	0.57	The highest
3. History of Ban Khru community	4.72	0.56	The highest
4. Main religious activities	4.88	0.32	The highest
Average	4.71	0.54	The highest

According to Table 3, the study showed the highest level of students' perception towards the developed series of digital content in the metaverse combined with participatory communication and learning with religious leader. The overall average level of perception was at the highest level ($\bar{x} = 4.71$, S.D.=0.54). The findings signified that study subjects appeared to perceive various perspectives towards Darun Naim Mosque at the highest level ($\bar{x} = 5.00$, S.D. = 0.00), followed by main religious activities ($\bar{x} = 4.88$, S.D. = 0.32), history of Ban Khru

community ($\bar{x} = 4.72$, S.D. = 0.56), and background of Darun Naim Mosque ($\bar{x} = 4.65$, S.D. = 0.57), respectively

4.5 The Results of Satisfaction Assessment in the Students

Table 4. The results of satisfaction assessment in the students

Topics of assessment	Results		
	\bar{x}	S.D.	Level of satisfaction
1. Content and language aspect	4.67	0.62	The highest
2. Images and description aspect	4.56	0.61	The highest
3. Visual and audio aspect	4.60	0.63	The highest
4. Presentation aspect	4.80	0.40	The highest
Average	4.63	0.60	The highest

According to Table 4, the highest level of students' satisfaction towards the developed series of digital content in the metaverse combined with participatory communication and learning with religious leader ($\bar{x} = 4.63$, S.D. = 0.60). The results also indicated the highest level of satisfaction in each aspect of the assessment including presentations aspect ($\bar{x} = 4.80$, S.D. = 0.40), content and language aspect ($\bar{x} = 4.67$, S.D. = 0.62), visual and audio aspect ($\bar{x} = 4.60$, S.D. = 0.63), and images and description aspect ($\bar{x} = 4.56$, S.D. = 0.61).

5. Discussions

The outcomes of needs survey displayed high level ($\bar{x} = 4.49$, S.D. = 0.70) of need for a series of digital content in the metaverse combined with participatory communication and learning with religious leader to enhance students' perception of community Mosque (Darun Naim). Videos and infographics were the main types of media that the study subjects expected on social media. Desired content of the media included various perspectives interviewing, the background of Darun Naim Mosque, the history of Ban Khru community, and main religious activities. Additionally, the study subjects preferred the digital content that contains both real pictures and graphics that are vibrant and soothing with description explaining the content itself. In order to develop appropriate media and relevant activities while also taking sustainability into consideration, the results from the needs assessment were used to plan and produce them. Disseminating knowledge or information about the background of Darun Naim Mosque and Ban Khru community is consistent with growth needs stage as explained through ERG Model by Alderfer Piroj (2019). The results of the assessment are also harmonized with the previous study conducted by Saengruangrit (2019) which indicated high level of need ($\bar{x} = 4.47$, S.D. = 0.66) for the development of promotional media using QR codes to increase sales in food and beverage business.

The researchers designed and developed a series of digital content in the metaverse combined with participatory communication and learning with religious leader to enhance students' perception of community Mosque (Darun Naim) through ADDIE Model (Chusangnil, 2012). The model is composed of 5 steps including analysis, design, development, implementation, and evaluation. In brief, the first step is to study problems and survey needs in order to analyze their scope and importance. The results of the analysis are then utilized to design appropriate media or content. Once the design step is complete, the media and content will be developed with expert consultation and piloted (or implemented) to determine its suitability and identify further area of improvement. At the evaluation step, the findings from piloting are collected, collated, and summarized. In addition to the developed media, the researcher incorporated participatory communication activities in and invited religious leaders to exchange their opinion with young people in the community. This approach also aligned with another study conducted by Thamwipat and Princhankol (2022) which applied ADDIE Model to design and produce interactive media to promote the Department of Education Communication and Technology.

The assessment of the developed content was at high level of quality ($\bar{x} = 4.33$, S.D. = 0.70) which is consistent with the hypothesis of this study. This implies that the digital content is accurate, comprehensive and practical. The results from this study were also in agreement with a study of the development of infographic digital content on social media to increase sales of homemade bakery by Binraman, P. and others (2022) which also indicated high quality content ($\bar{x} = 4.49$, S.D. = 0.57) and showed that the content was accurate, comprehensive, and easy to understand. Very good quality of media presentation was observed in this study ($\bar{x} = 4.70$, S.D. = 0.47) as the designed media was visually appealing and easy to understand. This is consistent with another study by Princhankol and Thamwipat (2022) of which the quality of media presentation was at a very good level ($\bar{x} =$

4.66, S.D. = 0.35). Similarly, the quality of the media presentation was at a very good level ($\bar{x} = 4.56$, S.D. = 0.43) in another research achieved by Namaso et al. (2022). This suggests that using infographics on online platform result in high quality media and are suitable and efficient for public relations purposes.

The global educational landscape has undergone a pedagogical transformation since the COVID-19 pandemic's emergence. The pedagogical potentials and rapidly growing practical benefits of a metaverse class as a substitute for in-person instruction are suggested by the explosion of 3D application and technology development. Therefore, by studying students' engagement and perceived experiences with metaverse platforms, this research aims to support practitioners and academics when using a metaverse platform in the classroom. Our findings point to clear benefits of metaverse-embedded instruction towards immersive and experiencing learning as well as the pedagogical effects of context-induced relevance, notwithstanding the necessity to tackle technological difficulties. The additional keyword analysis explains why students used different language to communicate their perceptions of each platform. Given that metaverse instruction has been successful.

The highest level of perception was detected in this research ($\bar{x} = 4.71$, S.D. = 0.54). This aligns with the idea proposed by Tessana (2012) that a picture is a useful tool to convey messages and tell stories especially when sufficient information is collected, summarized, and presented with the picture. The benefits of using infographics and videos on social media and in the metaverse platform are consistent with a study carried out by Hwang et al. (2023). Their study aimed to provide support to practitioners and academics using a metaverse platform and evaluate their student's engagement and experience in their classroom. Their research findings displayed advantages of metaverse-embedded classroom including immersive and experiential learning as well as its success as a new teaching and learning platform. The series of digital content produced in this study incorporated graphics and participatory communication activity with religious leader as well as using appropriate media platform for the target audience (i.e. Facebook, Zoom, and Metaverse); therefore, this enhances engagement in young people and exchanges between the religious leaders and young people resulting in the highest level of perception in the study subjects.

As the formulated hypothesis, the highest level of satisfaction ($\bar{x} = 4.63$, S.D. = 0.60) was observed following the assessment. Infographic-based digital content was designed and applied in this study for ease of understanding. This also corresponds to another study conducted by Rider (2013) which highlighted that people tend to absorb and digest a large amount of information through graphics better than long texts. Using participatory communication activities to foster interaction between the religious leaders and young people in the community is also consistent with the concept in the previous study by Boonklang (2018) which emphasized the importance of participatory communication as a method to strengthen interaction between information senders and receivers. Furthermore, the research findings are harmonized with the outcomes from the development of online content and interactive communication activities to raise awareness among students about fake news conducted by Nuannimnoi et al. (2022) of which the highest level of satisfaction ($\bar{x} = 4.69$, S.D. = 0.10) was observed. In conclusion, implementation of participatory communication and learning with religious leader along with a series of digital content including videos, infographics, in the metaverse are engaging and easy to understand, and resulted in the highest level of satisfaction among the study subjects.

6. Suggestion

6.1 Suggestions from Research Findings

- 1) The developed series of digital content in the metaverse utilized along with participatory communication and learning with religious leader to enhance students' perception of community Mosque can be used as a public relations or leaning tool to describe the background of the community and the mosque. This includes video clip, and infographic posters in the metaverse which are downloadable and accessible on smartphones and tablets.
- 2) The findings from this study can be further used to design and produce various public relations or learning media content, such as directory of the religious leaders, monthly religious activities at the mosque or Al-Bidayah Religious School, Thung Khru District, Bangkok etc.

6.2 Suggestions for Further Research

- 1) Components of media development and communication or learning activities to promote a mosque in religious students from Al-Bidayah Religious School, Thung Khru District, Bangkok should be explored.
- 2) Different types of digital content, such as gamification and novel technology, such as Augmented Reality (AR) and Virtual Reality (VR) should be incorporated to enhance engagement in religious students to learn more about the history of their community and mosque.

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Thamwipat, K., Pattrapong, P. and Supinanont, P. were responsible for study design, research tools, data collection, statistical analysis, literature review, and revising. Thamwipat, K. and Pattrapong, P. drafted the manuscript. Supinanont, P. and Princhankol, P. revised it. Thamwipat, K. was the corresponding author. All authors read and approved the final manuscript.

Competing interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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