THE DEVELOPMENT OF COMPUTER MULTIMEDIA ON THE MUSEUMS IN UNIVERSITY

[1]YONGYUTH KIDSUNTAD, [2]SIRIPORN POOLSUWAN, [3]WIJITTRA KHAISANG, [4]WITCHAYA WANNASIT

[1]Faculty of Humanities and Social Sciences, Suan Sunandha Rajabhat University, Bangkok, Thailand
[2,3,4]Information Sciences Department, Suan Sunandha Rajabhat University, Bangkok, Thailand
E-mail: [1]yongyuth.ki@ssru.ac.th, [2]siriporn.po@ssru.ac.th, [3]wijittraa.K@gmail.com, [4]witchaya.nam@gmail.com

Abstract - This survey research aims to develop computer multimedia on museums in Suan Sunandha Rajabhat University, to assess quality of computer multimedia on museums in Suan Sunandha Rajabhat University, and to study a satisfaction level of the students in the multimedia. Tools applied in the study were computer multimedia on the university's museums and questionnaire towards the developed multimedia. Data was gathered by using questionnaire from 377 regular-course undergraduate students of Suan Sunandha Rajabhat University. Mean, percentage, standard deviation were applied for data analysis. This research revealed that in overall, the quality of the computer multimedia on museums in Suan Sunandha Rajabhat University was in high level. Considering in each aspect, it was found that respective content, utilization and presentation were in high level. Nevertheless the satisfaction of the students towards the computer multimedia was in high level in overall. The results also were in high level in each 3 aspects i.e. content, utilization and presentation, respectively.

Index Terms - Computer Multimedia, University Museum

I. INTRODUCTION

On 24th August, 2007 International Council of Museums (ICOM) provided a definition of a museum as a place for exhibiting items in order to provide knowledge and entertainment for its audience. Normally, a museum is operated as a public space and a permanent institution for providing social service and development. Museum is a non-profit organization that is responsible for acquiring, conserving, researching, communicating and exhibiting the tangible and intangible heritage of humanity and its environment for the purposes of research, education and enjoyment [1]. In addition, it can reflect national development standards by cohering the past to the present, demonstrating conception, belief, taste in way of life. In developed country, museum has been a tool for promoting and improving people in its society [2] and has been a place with educational roles, as well as one of a learning source. It is opened for the general public for seeking knowledge equally and they are able to use it for self-seeking knowledge during their entire life [3]. Furthermore, ICOM has classified these places as a museum, i.e. a place for conservation and reservation, a permanent exhibition zone in library and archive, an archaeological site and monument, ethnological and natural monument, historical monument and a place operated as museum based on its activities and preservative activities, life-form exhibition institution i.e. botanical garden, zoo, ocean-life exhibition, life-form exhibition and science exhibition and planetarium.

In regard to Thailand, the Thai Ministry of Culture has summarized a definition of museum as an institution established for acquiring, conserving, studying, researching, experimenting and exhibiting cultural and scientific objects which are pieces of evidence of humanity and nature for an educational and entertainment benefits. Art gallery, historical monument, zoo, botanical garden, forest park, aquarium and other places exhibiting life forms. According to statistic figure of current number of museums in the world as determined in the book "Museums of the World", 21st Edition [4], the number presented 55,000 museums in 202 countries.

Originally, Suan Sunandha Rajabhat University was the royal inner court which was a residence for inner royal family of King Chulalongkorn (King Rama V). At present, several royal residences are renovated into museums exhibiting His Majesty's biography, practices and royal duties of consorts who once resided in these residences. They represent the cultural reform age in regard to the evolution of aesthetics, demonstrating national prosperity. All are expressed through the residential buildings constructed for King's Consort in Suan Sunandha. [5]

According to the modern museum management together with the dynamic multimedia presentation, hence the name is so called "Sai Sutha Nopadol Museum" and the Three-Rattanakosin Art Learning Resource Center [6]. The Museum and the Resource Center are administered under the Arts and Culture Office, Suan Sunandha Rajabhat University. Therefore they are historical monuments arranged into a museum which consists of 4 buildings i.e. Arthorn Dhipaya Niwas building : exhibiting visual arts; Jutha Rattanaporn building : exhibiting musical arts and Euan At Thaem Thawan building : exhibiting Thai dancing art. The museum, Sai Sutha Nopadol

houses the Arts and Culture Office of Suan Sunandha Rajabhat University and conserves tools and utensils used by Sai savali Bhiromya, Princess Suddhasininart Piyamaharaj Padivaradda and exhibits watercolor paintings. However, Euan At Thaem Thawan building is recently closed for renovation.

Computer multimedia is a utilization of computer operating with software to communicate a required story, scenario and content; multiple media i.e. text, image, animation sound and video are combined together and users are able to control these medias as what they desire to present. They are interactive multimedia which is able to use via keyboard, mouse or pointer, etc. Utilizing multimedia in such interactive way allows users to learn or perform activities, as well as to watch several media by themselves. The media integrated into multimedia i.e. image, sound and video will encourage diversity of computer usage which is an emerging computer technology, making a computer usage interesting and appealing and more enjoyable learning [7]. Computer multimedia on Museums in Suan Sunandha Rajabhat University has been created to present the background of the University's Museums, as well as to present data and knowledge in each museum in order to be a learning source of the origin of their undergraduate students and institute.

II. LITERATURE REVIEWED

A. Computer multimedia

Media are several elements combined together for creating interaction or reaction between a computer and a user. It is considered an activity which allows the users to choose what they require to perform. In addition, many interactions are feasible; however, it depends on the tools and forms to be applied via menu buttons or text with color that is different from normal text. When the interactions are made with this section, a system will navigate to other relevant predesigned sections. Elements of multimedia are [7] as follows: (1) message or text: it is an important basic element of multimedia and a multimedia system presented via display, in addition to wide-ranging of color and text to choose from as required, interactions assignment while presenting can be determined; (2) still image: it is a single static image i.e. photograph, drawing and sketch, etc., it plays more roles than text or character in a multimedia system as it is capable to express more deeper meaning, as in this case, text or character has its limitation by each language variation but no limitation in an image which can communicate meaning for every nationality; (3) animation: it refers to an animated graphic art to demonstrate continuous steps or effects;(4) sound: it contributes to multimedia system in attractiveness and interest in order to create a better multimedia system and (5) video: it can be used for presenting text or image, both static and animated one, in combination with the sound.

B. Related literature

Somsak Suriyan-A-nothai (2007) has conducted a study on multimedia computer development to be used in promoting Bangkok Technical of Business Administration School. A quality assessment performing by expertise yielded good result; a satisfaction evaluation was also in high level [8]. Pusadee Bumrungkit (2007) has conducted a study on multimedia computer development to be used in promoting occupational guidelines for undergraduate students in the Faculty of Engineering, Srinakharinwirot University. A quality assessment performing by expertise yielded good result; a satisfaction evaluation was also in high level [9]. Satrawut Jitpilai (2008) has developed multimedia for Thai So Museum, Kusuman District, Sakon Nakhon Province. The results signified that an efficiency in multimedia developed was in excellent level [10]. Voraphot Maicami (2010) has created multimedia on Phimai Stone Castle in order to measure satisfaction level of users. As for the results, the satisfaction was in high level [11], and Sophat Sopapimuk (2013) and Sawitri Phohrai, Thatsanan Chutosri, Siriporn Poolsuwan, Sirakup Bilchon (2017) has conducted a study on how to create multimedia lesson: the Five Precepts. A quality assessment performing by expertise yielded good result; a satisfaction evaluation yielded good result [12], [13].

III. METHODOLOGY

The purposes of this study are to (1) develop computer multimedia on museums in Suan Sunandha Rajabhat University (2) to assess quality of computer multimedia on the university's museum and (3) to study satisfaction of students towards the computer multimedia. This study, which was a case study at Suan Sunandha Rajabhat University in Thailand, was based on a quantitative method. 17,708 in 1st semester regular-course undergraduate students from 6 faculties of Rajabhat SuanSunadha University were selected as the population (N). 377 people of sample (n) were obtained by utilizing stratified random sampling technique.

A. Computer multimedia development

The steps of computer multimedia development are as follows:

1. Analysis phase: Contents Analysis use to examine documents and pieces of research on Sai Sutha Nopadol Museum and Three-Rattanakosin Art Learning Resource Center in Suan Sunandha Rajabhat University. They were synthesized and contents were assigned for using in the multimedia. There were 2 aspects of contents i.e. background and

exhibited objects. Five forms of multimedia were assigned for using in the multimedia i.e. character or text, image, animated image, video and sound.

2. Designing phase: The design was done and several preparations were prepared to be a developing guideline of multimedia as follows:
2.1 Writing script
2.2 Animation outlines
2.3 Storyboard
2.4 Contacting film shooting location
2.5 Preparing film shooting equipment
2.6 Determining sound effect to be used in multimedia
3. Developing phase: flowchart are as follows:
3.1 Retrieving image from books and internet
3.2 Photographing and shooting in several locations
3.3 Retouching the photographs and video
3.4 Animating and adding special effects
3.5 Sound recording
3.6 Editing video and sound files
3.7 Processing and storage
3.8 Acquiring the multimedia for experts to assess and answer multimedia quality questionnaire
3.9 Re-editing and improving the multimedia as per suggestions by experts before running a trial
4. Trying out phase
5. Field deployment, collecting data and assessment

B. Data collection
Computer multimedia on the museums in Suan Sunandha Rajabhat University and questionnaires were utilized as tools in the research. The questionnaire was divided into 4 main parts: The first part of questionnaire included the questions of demographic concerning, gender, college year. The second part of questionnaire included the computer multimedia's contents. The third part of questionnaire included the presentation forms and the fourth part of questionnaire included computer multimedia utilization. Data collection was done from 6th November, 2017 to 17th November, 2017. Mean, percentage, standard deviation were applied for data analysis.

IV. RESULTS

The descriptive statistics was used to assess a satisfaction level of the students in the multimedia on the museums in Suan Sunandha Rajabhat University, It is shown as Table I to Table III

A. Background of Respondents
Most respondents were female (50.90%) and male (49.10%); they were 4th year students (45.60%), 1st year students (31.60%), 3rd year students (14.30%) and 2nd year students (8.50%), respectively

B. Quality of computer multimedia
The results are as below:

Items	$\bar{X}$	S.D.	Result	Ranking
1. Content	4.31	0.45	High	1
2. Utilization	4.21	0.56	High	3
3. Presentation forms	4.28	0.60	High	2
Total	**4.27**	**0.45**	**High**	

TABLE I Quality of computer multimedia on museums in Suan Sunandha Rajabhat University

From TABLE I, It is shown that the overall results of quality of computer multimedia on museums in Suan Sunandha Rajabhat University were in high level. Considering in each aspect, the results were all high level whether the content ($\bar{X}$= 4.31, S.D.= 0.45), utilization ($\bar{X}$= 4.28, S.D.= 0.60), and presentation forms ($\bar{X}$= 4.21, S.D.=0.56) respectively

Type of Quality	$\bar{X}$		S.D.	Result	Ranking
1. In content					
1.1 Accuracy	4.38		0.64	High	2
1.2 Completeness	4.30		0.60	High	3
1.3 Intuitive	4.29		0.69	High	4
1.4 Grammar	4.44		0.63	High	1
1.5 appealing presentation	4.16		0.61	High	5
Total	4.32		0.45	High	
2. In presentation					
2.1 suitable size and color of characters	4.23		0.75	High	2
2.2 high resolution and attractive images and videos	4.11		0.75	High	6
2.3 clearly expressive and consistent images and videos	4.20		0.69	High	4
2.4 appropriate time tables	4.12		0.78	High	5
2.5 suitable and clear soundtrack	4.41		0.70	High	1

2.6 relevant and clear music	4.20		0.75	High	3
Total	4.21		0.57	High	
3. utilizations					
3.1 more viable understating on museums in the university after using the multimedia	4.36		0.70	High	1
3.2 increased attractive level urging to visit museums in the university after using the multimedia.	4.21		0.68	High	2
Total	4.29		0.60	High	

TABLE II Quality of computer multimedia on museums in Suan Sunandha Rajabhat University in each aspect

From TABLE II, It is shown as follows:
1. In regard to quality of contents, overall results showed high level and in each aspect, the result were in all high level i.e. correct language usage according to the grammar, accurate and complete contents and intuitive and appealing presentation;
2. Pertaining to quality of presentations, overall results presented high level and in each aspect, the result were also in high level i.e. suitable and clear soundtrack, suitable size and color of characters, relevant and clear music, clearly expressive and consistent images and videos, appropriate time tables and high resolution and attractive images and videos;
3. Regarding quality of utilizations, overall results were in high level and in each aspect, the result were all in high level i.e. more viable understating on museums in the university after using the multimedia, increased attractive level urging to visit museums in the university after using the multimedia.

Items	$\bar{x}$	S.D.	Result	Ranking
1. content	4.32	0.46	High	1
2. presentation forms	4.18	0.54	High	3
3. utilization	4.25	0.59	High	2
Total	**4.25**	**0.43**	**High**	

TABLE III Undergraduate students satisfaction towards the multimedia on museums in Suan Sunandha Rajabhat University

From TABLE III, It is shown that the satisfaction towards the multimedia on museums in Suan Sunandha Rajabhat University, the overall results was in high level. Considering in each aspect, the results were all in high level in the content, utilization, and presentation forms.

CONCLUSION AND DICUSSION

In conclusion, the study revealed as follows;

A. The quality of computer multimedia

Study performed on the quality of multimedia on Museums in the Suan Sunandha Rajabhat University signified high level in consistence with the presumed hypothesis and pieces of research performed by Somsak Suriyan-A-nothai [8], Pusadee Bumrungkit [9], Satrawut Jitphilai [10] and Sophat Sophaphimok [12] as they obtained results being in high level.

B. Satisfaction of undergraduate students

The Satisfaction of undergraduate students towards multimedia on museums in the Suan Sunandha Rajabhat University was in high level in consistence with the presumed hypothesis and pieces of research performed by Somsak Suriyan-A-nothai [8], Pusadee Bumrungkit [9], Voraphot Maicami [11], and Sophat Sophaphimok [12] as they obtained results being in high level.

FUTURE WORK

The findings could be used as primary data for university's administrators for applying the multimedia for encouraging undergraduate students in Suan Sunandha Rajabhat University and its campuses, as well as third parties to be aware of important and valuable museums and learning sources.

ACKNOWLEDGMENT

This study was successful by financial support from Suan Sunandha Rajabhat University and many helps from my colleagues.

REFERENCES

[1] International Council of Museums. (2007). Museum definition. Retrieved October 5, 2017, from http://icom.museum/the-vision/museum-definition/
[2] R. Promyen. Muse pass is tour card : one ticket for 20 museums. Retrieved August 20, 2017, from ttps://travel.kapook.com/view90373.html
[3] U. Choeikiwong. Guideline to management : Non formal and informal education According to the National Education Act BE 2542. Bangkok: Bunnakit, 2002.
[4] Museums of the world. (2014). Berlin, Boston: De Gruyter Saur. Retrieved May 17. 2018, from https://www.degruyter.com/view/product/212452
[5] Suan Sunandha Rajabhat University. The Arts and Culture Office. The Royal (family) members in San Sunandha. Bangkok: SSRU, n.d.

[6] Suan Sunandha Rajabhat University. The Arts and Culture Office. 3 Silapa Rattanakosin Resource Center and Sai Sutha Nopadol Museum. Retrieved August 20, 2017, from http://www.museumthailand.com/museum-detail.php?m=401

[7] K. Malithong. Education and innovation technology. Bangkok: Arun Printing, 2005..

[8] S. Suriyan-A-nothai. The development of a computer multimedia for public relation at Bangkok technical of business administration school. Master of Education Program in Educational Technology Thesis, Srinakharinwirot University, 2008.

[9] P. Bumrungkit. The development of a computer multimedia package to promote vocational guidelines for graduated engineering students, Srinakharinwirot University. Master of Education Program in Educational Technology Thesis, Srinakharinwirot University, 2008.

[10] S. JitpiLai. The development of a computer multimedia on Thai So People in Kusuman District, Sakon Nakhon. Master of Science Program in Creative Media Thesis , Mahasarakham University, 2009.

[11] V. Maicami. multimedia on Phimai Historical Park. Master of Science Program in Creative Media Thesis, Mahasarakham University, 2010.

[12] S. Sopapimuk. The creation of animated multimedia learning package entitled “The Five Commandments of the Buddha”. Master of Industrial Education and Technology Thesis, King Mongkut's University of Technology Thonburi, 2013.

[13] S.Phohrai, T.Chutosri, S.Poolsuwan, S.Bilchon. Development of media applications from supplementary text book for development reading on “Mana Mani, Prathom Suksa”. 14th National Academic Symposium, Kamphaeng Saen Campus, Kasetsart University, 2017.

★★★