

Digital storytelling with animation media in the new normal education system

Chanyanuch Srimala, Jirawat Aueng & Pinanta Chatwattana

King Mongkut's University of Technology North Bangkok
Bangkok, Thailand

ABSTRACT: Animation media used in digital storytelling in the new normal education system are considered a tool to publicise study programmes, including a broadcast course, in the form of 2D animation, so that those interested in a given programme, both in and outside the University, can receive it and learn from it. The purpose of this study was to investigate the efficiency and usefulness of animation media in digital storytelling in the educational context. There were 40 participants in this research including professors, personnel and students of King Mongkut's University of Technology North Bangkok, Thailand, as well as the general public outside the University. The research results show that the animation media used in digital storytelling can be used as an efficient public relations tool through smartphones for university staff and students, and the general public, hence enhancing public relations. This is because the media content is clear and easy to understand. Also, the results indicate a very high level of satisfaction towards the animation media used in digital storytelling in all the aspects tested: content, image, sound and time.

INTRODUCTION

The 20-Year National Research and Innovation Strategy (2018-2037) has set up a vision suggesting that *Thailand should make use of research and innovation in order to become a developed country within 20 years with both wealth and sustainability*. Strategy 1 illustrates the development of technology and digital innovation that can support both production and development [1].

Based on that strategy, appropriate guidelines have been established for the provision of technology platforms and digital infrastructure to accommodate the production and service sectors, especially those related to the development of knowledge that integrates computer science and information technology with the knowledge about society, arts, cultures, communication arts and mass communication. This is all aimed to establish the foundation for developing creative and diverse digital content [1][2].

Digital media in the form of animation have become an important element of multimedia today due to the fact that the use of images can help enhance the imagination of users and bring about interaction, encouraging users to follow the selected content in a continual manner and enabling them to have interaction with the instructional media in real time. In addition, animation can attract attention better than inanimate messages. Particularly, the use of 3D augmented reality technology in the production of instructional media can make the multimedia appear more useful and valuable [3].

Digital storytelling refers to the use of digital media to create, tell, and share stories. It is in the form of workpieces produced by integrating a variety of media, such as images, music, contents, storytelling, etc. Digital storytelling increases learners' digital literacy and enhance their imagination and experiences [4][5].

Public relations tools in social media enable many people to get updated information in a rapid manner. At present, the use of information and communication technology is very important for the management of public relations for the 21st Century learners [6]. Thus, establishing and encouraging public relations in the new normal era is regarded as an option that can enhance the good image of organisations, while facilitating efficient communication that can render understanding in the same direction [7].

Mobile application refers to the development of application programs designated for use on such mobile devices as mobile phones, tablets, etc, with an intention to satisfy users' needs in terms of convenience and ease of use [8][9]. Currently, there are several operating systems for use on mobile phones or smartphones, e.g. iOS and Android, and this results in the development of many applications for such devices, such as maps, games, Chatbot, as well as those that provide services to support business operations and educational activities [10].

Electronics Engineering Technology is a programme in the College of Industrial Technology at King Mongkut's University of Technology North Bangkok, Thailand, and there are many courses available within this programme. Broadcast is one of these courses. In this course, the instruction of both theories and practices related to radio and television broadcasting is emphasised, so that students can apply the knowledge and experiences derived from this course to fulfil the demand of the industrial sector.

Therefore, it is quite necessary to establish public relations tools and methods to introduce information about Broadcast to benefit students and the general public, all stakeholders in and outside the University. Also, as mentioned above, establishing good public relations through various means has become an option that can enhance the good image of organisations and facilitate efficient communication and mutual understanding [7].

In the context of the above background, the authors of this article, came up with an idea to develop 2D animation media for use in digital storytelling in order to introduce the Broadcast course to the intended audience, both in and outside the University, so that they could receive correct and more comprehensive information about the course of interest. Furthermore, the authors expected - as this kind of media corresponds to the communication system in the digital age - that the use of animation media in digital storytelling will facilitate active learning on smartphones and tablets, and at the same time propagate the reliable information.

RESEARCH OBJECTIVES AND HYPOTHESES

In the new normal education system, the objectives of this research were to:

- O1: Synthesise the conceptual framework of digital storytelling with animation media;
- O2: Design appropriate animation media for use in digital storytelling;
- O3: Develop the animation media for use in digital storytelling;
- O4: Examine the level of satisfaction towards digital storytelling with the developed animation media.

RESEARCH METHODOLOGY

This research was concerned with the design and development of animation media for use in digital storytelling in the new normal education system. Thereby, the following methodology was applied:

Research Participants

There were 40 participants in this research including professors, personnel and students of King Mongkut's University of Technology North Bangkok, Thailand and the general public outside the University, all of whom were derived by means of cluster sampling.

Data Collection and Analysis

In this study, an evaluation form was used to test the level of satisfaction towards the digital storytelling with animation media under development. The statistics used in data analysis were mean and standard deviation.

Methodology

The research methodology was based on the theories of design and development of multimedia materials and animation of Tiantong [11], the analysis, design, development, implementation and evaluation (ADDIE) model [12][13] and the software development life cycle (SDLC) process [14]. Thereby, the methodology - applied in the new normal education context - can be summarised in four phases as shown below:

- Phase 1: Literature review and synthesis of the conceptual framework of digital storytelling with animation media. The guidelines to synthesise the conceptual framework were based on publications on digital storytelling [4][5], animation media [3], mobile application [8-10] and public relations [6][7].
- Phase 2: Design of the animation media for use in digital storytelling. In this phase, the researchers applied the theories of design and development of multimedia materials and animation, which consist of five elements, i.e. balance, unity, colour, flow and interaction, as a guideline to design the animation media [11].
- Phase 3: Development of the animation media for use in digital storytelling. The guidelines for the development in this stage include the principles of the ADDIE model [12][13] and the steps in the SDLC process [14] (Figure 1).
- Phase 4: Examine the satisfaction level of the developed animation media for digital storytelling. The researchers gauged the level of satisfaction of all 40 participants, including ten females and 30 males who were mainly within the age range of 15-40 years, with some above the range. At the time of this research, these participants were professors, personnel and students of King Mongkut's University of Technology North Bangkok, Thailand.

The population sample also included members of the general public outside the University. The evaluation and interpretation scores [15] are shown in Table 1.

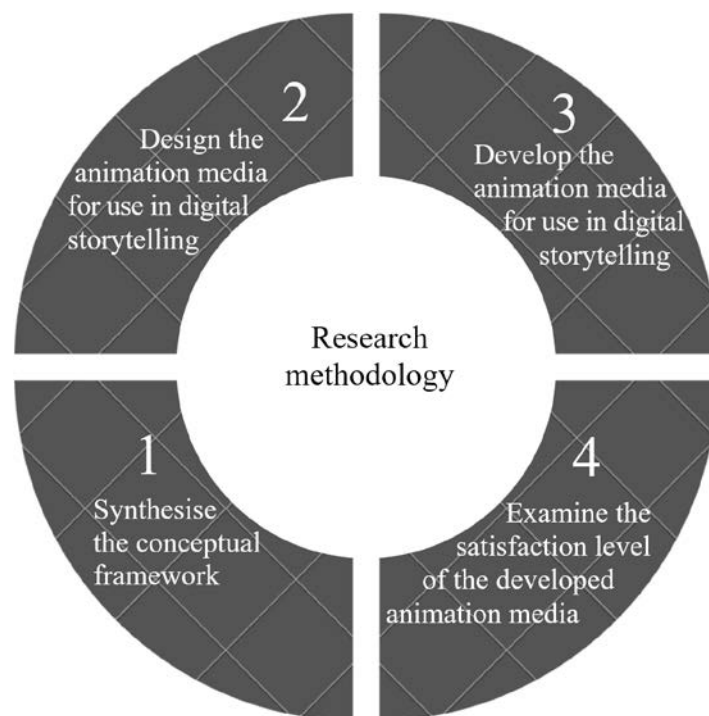


Figure 1: Research methodology.

Average score range	Result
4.50 - 5.00	Satisfaction is at very high level
3.50 - 4.49	Satisfaction is at high level
2.50 - 3.49	Satisfaction is at moderate level
1.50 - 2.49	Satisfaction is at low level
1.00 - 1.49	Satisfaction is at very low level

Table 1: Average score range and interpretation of results [15].

RESULTS

The results of the development of the animation media for use in digital storytelling in the new normal education system can be summarised as below:

1. Synthesis of the Conceptual Framework of Digital Storytelling with Animation Media

In this stage, referring to the review, analysis and synthesis of research publications and other relevant documents on digital storytelling, animation media, mobile application and public relations, the researchers focused on the guidelines for the conceptual framework, which is shown in Figure 2.

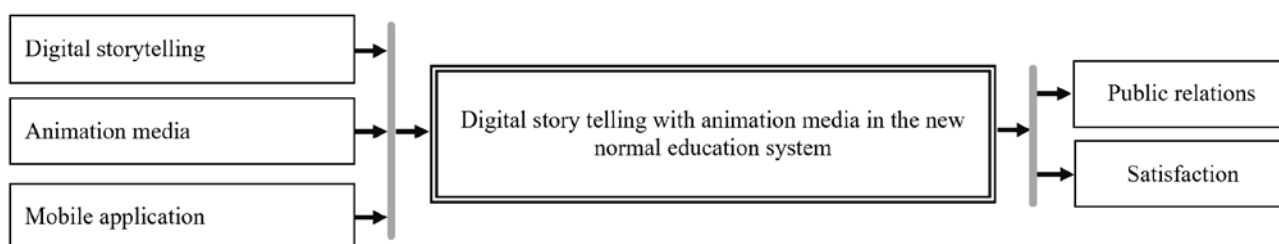


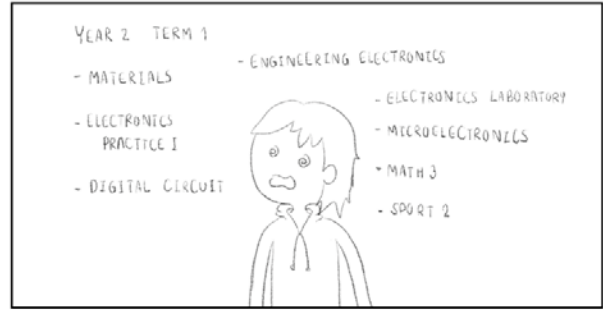
Figure 2: Conceptual framework.

2. Design of the Animation Media for use in Digital Storytelling

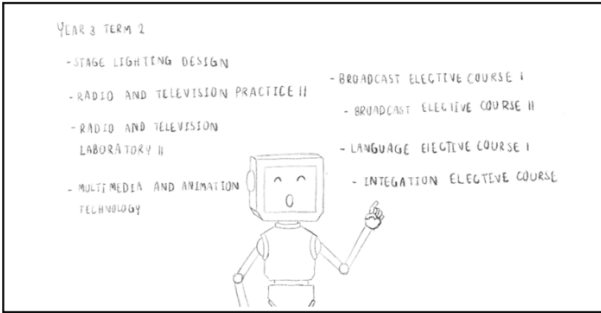
The animation media of this kind were designed based on existing principles of design and development of multimedia materials and animation, which consist of five elements, i.e. balance, unity, colour, flow and interaction [11]. The design ideas have been visually captured in the form of a storyboard, as shown in Figure 3a-Figure 3f.



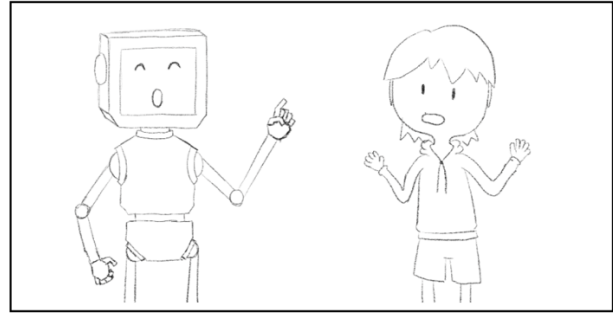
3a



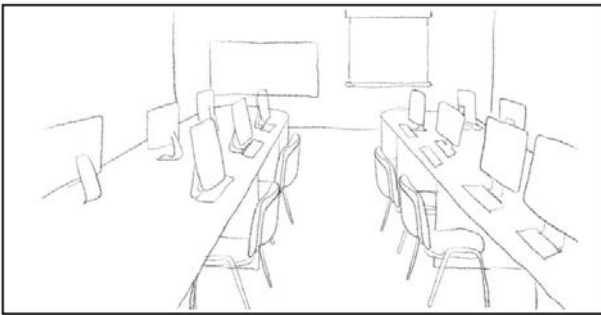
3b



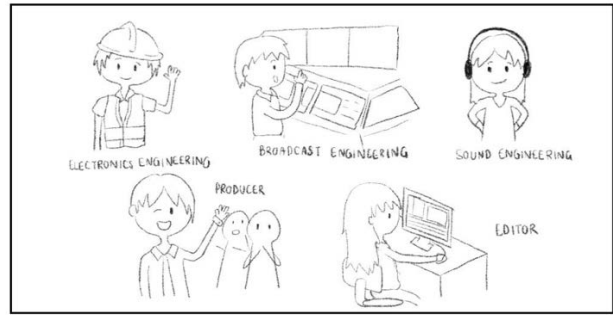
3c



3d



3e



3f

Figure 3: Design outline of the animation media for use in digital storytelling.

3. Development of the Animation Media for use in Digital Storytelling

The researchers applied the principles of the ADDIE model [12][13] and the steps in the SDLC process [14] to create the animation media for use in digital storytelling. The developed animation media are intended to introduce the Broadcast course to the audience, both in and outside the University, so that each interested person can receive correct and more comprehensive information. As mentioned earlier, this kind of media corresponds to the communication system in the digital age, and it is expected that it can facilitate active learning on smartphones and tablets, while propagating the reliable information. The developed animation media are shown in Figure 4a-Figure 4f.



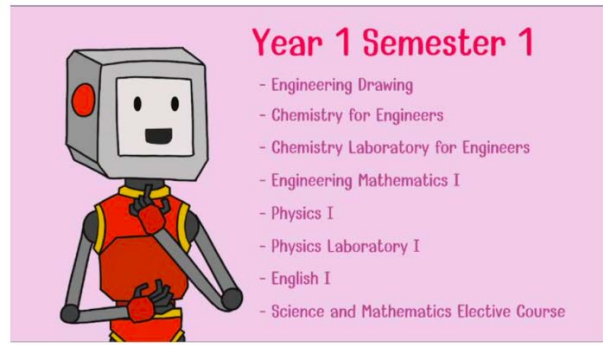
4a



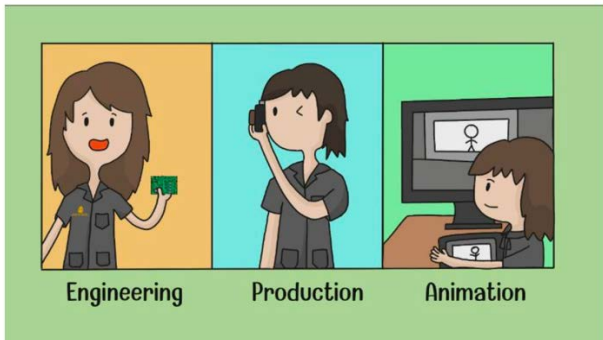
4b



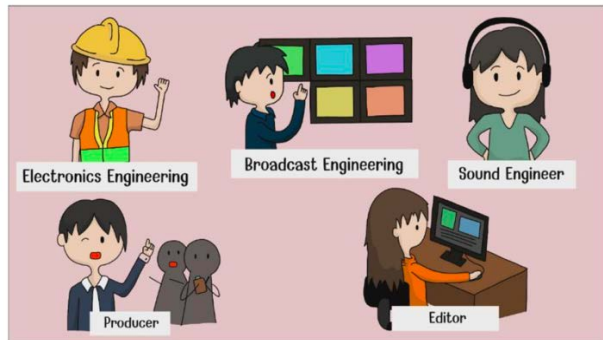
4c



4d



4e



4f

Figure 4: Developed animation media for use in digital storytelling.

4. Examination of the Level of Satisfaction towards the Developed Animation Media for use in Digital Storytelling

The user satisfaction of all 40 participants towards the developed animation media was gauged in terms of four aspects - content, image, sound and time. The results of this evaluation are included in Table 2.

Table 2: User satisfaction towards the developed animation media.

Aspect	Evaluation item	Measure		Satisfaction
		Mean	SD	
Content	1. Animation provides correct information	4.80	0.41	Very high
	2. Animation is creative, interesting and attractive	4.78	0.42	Very high
	3. Animation provides concise and comprehensible information	4.83	0.38	Very high
	4. Animation presents modern and updated content	4.70	0.46	Very high
	5. Animation can be applied in professional life	4.78	0.42	Very high
Image	1. Design of characters and scenes	4.83	0.38	Very high
	2. Continuity and consistence of image sequencing	4.78	0.42	Very high
	3. Resolution of images	4.75	0.44	Very high
Sound	1. Audio description is clear	4.78	0.42	Very high
	2. Audio description complies with images	4.82	0.38	Very high
	3. Narrator's voice corresponds to images	4.75	0.44	Very high
Time	1. Consistence of time and content	4.83	0.45	Very high
	2. Consistence of time and subtitles	4.80	0.41	Very high
Overall satisfaction		4.78	0.42	Very high

As demonstrated in Table 2, the overall satisfaction towards the developed animation media across all participants representing University staff, students and the general public is at a very high level. It is also noticeable that the standard deviation has a small distribution and the mean data are quite similar, which results in small discrepancies in the results as well. This confirms that most of the users felt very satisfied while watching the animation media. Therefore, according to the results, it can be concluded that the developed animation media is an effective tool in public relations within and outside the University.

CONCLUSIONS

Animation media for use in digital storytelling in the new normal education system is a tool to publicise study programmes, including the Broadcast course, so that those interested in a programme or a course both in and outside the University, can receive correct information and learn accordingly. The animation media developed in this research, are in the form of a video clip using 2D animation and convey reliable course information as an interesting and engaging story. The animation media are presented in an academic style with clear, comprehensible and concise content. Importantly, the content is also compliant with the courses available within the broadcast of electronics engineering technology programme. Also, the media can be employed as a public relations tool, which not only provides users with helpful and reliable information, but also facilitates active learning on smartphones.

According to the evaluation results of the satisfaction level of all 40 participants towards the developed animation media, it was found that 1) the animation media can be used as an efficient public relations tool on smartphones for persons within and outside the University, because the content in the media is clear, concise and easy to understand. Also, the content provides information that corresponds to the available courses, which is very helpful to the users; and 2) satisfaction towards the animation media used in digital storytelling in regard to the Broadcast course was at a very high level in all four tested aspects - content, image, sound and time (mean = 4.78, SD = 0.42), and the developed media can enhance public relations.

The overall results indicate that in this development appropriate elements have been examined and used to create an efficient tool for use in public relations. This is in accordance with another study by Chatwattana, who pointed out that the management of learning environments by making use of current technologies facilitates modern learning and leads to creating a learning society in digital universities [16]. Moreover, the results are also consistent with the study of Charaluk et al, who stated that mobile applications can be used to promote proactive public relations to satisfy the needs of users who prefer quick access to information via smartphones and tablets [7].

REFERENCES

1. National Higher Education, Science, Research and Innovation Policy Council., Research and Innovation Strategy 20 Years B.E. 2560-2579 (2017), 27 January 2023, https://www.ubu.ac.th/web/files_up/03f2019013108571396.pdf
2. Karapakdee, J. and Piriyaawong, P., Cognitive Technology for Academic Counselling in New Normal. *International Education Studies*, 15, 5, 49-58 (2022).
3. Chatwattana, P., *Multimedia and Animation Technology*. Bangkok: KMUTNB Textbook Publishing Center (2019).
4. Thanachan, P., The Development of Digital Storytelling Design Model using Concept Map on Blog to Enhance Creative Thinking of Undergraduate Students. Degree of Master Educational Communications and Technology, Faculty of Education, Chulalongkorn University (2012).
5. Ohler, J., *Digital Storytelling in the Classroom: New Media Pathways to Literacy, Learning, and Creativity*. CA: Corwin Press (2008).
6. Jularlark, S., Chatwattana, P. and Piriyaawong, P., Information system for public relations via mobile application using in-depth user experience according to education experts. *World J. on Educational Technol.: Current Issues*, 14, 3, 579-591 (2022).
7. Charaluk, S., Meechao, A. and Chatwattana, P., The development of mobile application with in-depth user experience theory to enhance proactive public relations of College of Industrial Technology at King Mongkut's University of Technology North Bangkok. *J. of Educational Technol. and Communications*, 5, 13, 17-33 (2022).
8. Jularlark, S., Chatwattana, P. and Piriyaawong, P., The architecture of an information system for public relations via mobile application using in-depth user experience for proactive perception of information. *J. of Educ. and Learning*, 10, 5, 91-101 (2021).
9. Sombut, P. and Manon, W., Development guideline for mobile application Thai mobile for customers of Thai Airways International Public Company Limited. *MBA-KKU J.*, 9, 1, 100-116 (2016).
10. Yilmaz, O., E-learning: students input for using mobile devices in science instructional settings. *J. of Educ. and Learning*, 5, 3, 182-192 (2016).
11. Tiantong, M., *Multimedia and Hypermedia*. Bangkok: KMUTNB Textbook Publishing Center (2005).
12. Khemmani, T., *Science of Teaching: Knowledge of Efficient Learning Process Management*. Bangkok: Chulalongkorn University Press (2010).
13. Utranan, S., *Systematic Instructional Management*. Bangkok: Chulalongkorn University (1982).
14. Dennis, A., Wixom, B. and Roth, R.M., *System Analysis and Design*. Hoboken: John Wiley & Sons (2013).
15. Kanasutra, P., *Statistics for Research in the Behavioral Sciences*. Bangkok: Chulalongkorn University Press (1995).
16. Chatwattana, P., Massive open online courses model with self-directed learning to enhance digital literacy skills. *Inter. J. of Engng. Pedagogy*, 11, 5, 122-137 (2021).