The Development of 2D Animation Media on the Self-care of Leprosy Patients for Public Health Personnel in Rajpracha Samasai Institute, Department of Disease Control, Ministry of Public Health

Kamonwan Buranut * 
Faculty of Industrial Education and Technology, King Mongkut's University of Technology Thonburi, Thailand
kamonwan.b@mail.kmutt.ac.th

Peangpen Jirachai 
Faculty of Industrial Education and Technology, King Mongkut's University of Technology Thonburi, Thailand
peangpen.jir@mail.kmutt.ac.th

Corresponding author E-mail: kamonwan.b@mail.kmutt.ac.th

Received: 16 June 2023; Revised 21 July 2023; Accepted 29 October 2023

ABSTRACT: *The purposes of this research were 1) to develop a 2D animation on the self-care of leprosy patients for public health personnel, Rajpracha Samasai Institute, Department for Disease Control, Ministry of Public Health, 2) to determine the quality of 2D animation media on the self-care of leprosy patients, for public health personnel, Rajpracha Samasai Institute, the Department for Disease Control, Ministry of Public Health, 3) to study the perception and satisfaction of the sample group watching the 2D animation media. The researchers developed the media based on the ADDIE model process. The tools used include: 1) 2D animation media, 2) content and media quality assessment, 3) animation media perception assessment, and 4) satisfaction assessment. The sample used in this research includes 30 health personnel who were public health workers from the Department of Disease Control at Ministry of Public Health and were acquired through simple random sampling. The result found that the content quality assessment was good ($\bar{x}$= 4.18, S.D. = 0.84). The media quality was at a very good level ($\bar{x}$ = 4.60, S.D. = 0.34), the perception assessment of the sample was at a high level, and the satisfaction assessment of the sample was at the highest level ($\bar{x}$= 4.74, S.D. = 0.45), Therefore, the 2D animation media on the self-care of leprosy patients for public health personnel at Rajpracha Samasai Institute, Department of Disease Control, Ministry of Public Health, can be considered a practical tool.*

Keywords: Animation 2D, Self-care to prevent disability, Leprosy, Rajpracha Samasai Institute, Department of Disease Control, Ministry of Public Health

1. Introduction

Media also plays a huge role in many areas - education, business, marketing, communications and telecommunications, and medicine and public health. There are many uses of media in the field of information dissemination, publicity, education, or entertainment, for example, animation media, or multimedia, play an important role as a medium that can transmit stories to people of all ages. With the nature of imaginative media, it is formed of creative content to communicate ideas and meanings to the addressee of knowledge that is unknowingly amenable, it is considered that "animation media" is a very influential medium of communication, and 2D animation media is a dynamic medium that can be used for educational purposes and various other tasks. Generally, our brains tend to retain images and sounds more effectively than written text. Therefore, when we create 2D animation and combine content with various elements, such as images, music, descriptions, and sound effects, it can effectively elucidate and communicate complex and challenging narratives better than printed media or static images alone. Moreover, it has the capacity to captivate audiences, making the content more engaging. This is why researchers have chosen to utilize 2D animation as a medium for their work. The aim is to impart knowledge about self-care for patients with skin diseases, enabling them to take care of themselves and follow the prescribed procedures accurately. Patients can readily adhere to their doctor's

guidance by accessing 2D Animated media anytime and anywhere, without the need to visit a medical facility. This not only saves valuable travel time but also reduces travel expenses and related inconveniences.

While everyone is currently interested in new diseases such as SAR / MERS or Even COVID-19, however, we should not overlook the chronic infectious disease that has been in the world for more than a hundred years. Which is leprosy Patients. or another name, skin disease. (Sasakawa, 2021). Which the Rajpracha Samasai Institute Department of Disease Control oversees and administers leprosy prevention nationally. In 1960, The Majesty King Bhumibol Adulyadej, King Rama IX, conceived the idea of constructing a facility dedicated to research and training for the purpose of producing leprosy officers. This initiative aimed to ensure an adequate workforce capable of conducting leprosy patient searches within communities affected by prevalent leprosy issues and providing home-based treatment. Under the auspices of this royal initiative, the institute and foundation were established to comprehensively support leprosy control activities, collectively known as "Rajchapracha Samasai." In line with this initiative, various government agencies have extended their strong support towards leprosy control efforts in Thailand. Their collective commitment includes endeavors to enhance the quality of life for disabled patients in leprosy settlements and communities, with the objective of preventing these individuals from becoming societal burdens or problems. The success of leprosy control in Thailand can be attributed to the collaborative efforts of various agencies across different sectors, including the public sector. This concerted approach has allowed the progression of leprosy control in stages. For instance, by 1970, significant data had been gathered after the Ministry of Public Health organized training programs, resulting in the training of a total of 8,500 officials. These officials were subsequently deployed to expedite patient searches in villages located in 40 provinces across the northeastern, northern, and central regions of the country. (Chua-Intra, 2021). A decade later, this proactive effort led to the discovery of previously undiagnosed leprosy patients. Treatment at home was provided to a total of 111,722 individuals. Out of these, 33,653 people were able to be removed from the surveillance register due to their successful recovery from the disease. In terms of epidemiology, disease control efforts effectively reduced the problem, with the prevalence rate decreasing from 50 per 10,000 populations in 2017 to 12.47 per 10,000 populations in 1970. Subsequently, leprosy control operations across all sectors persisted until 1981-1984. During this period, the Ministry of Public Health formulated guidelines for short-term combination drug therapy (Multidrug Therapy) aimed at reducing the treatment duration. Simultaneously, efforts to expedite patient surveys in every district and village were intensified, leading to a significant reduction in the number of patients. This concerted approach successfully lowered the national average prevalence rate of the disease to 0.9 per 10,000 populations, surpassing the international criteria for being classified as a public health problem (1 per 10,000 population) since 1994. In the context of the disease situation, both the prevalence rate (PR) and the rate of new patient detection (DR) have shown a continuous decline. In 2012, the disease prevalence rate stood at 0.09 per 10,000 people, while the rate of new patient detection was 0.34 per 100,000 people. Analysis of new patient distribution in 2019 revealed that new cases were predominantly concentrated in 128 districts across 46 provinces. Notably, the majority of these new cases were detected in the northeastern region and the southern border provinces. As a result, the leprosy prevalence rate (PR) dropped to 0.04. However, a persistent issue is the occurrence of grade 2 (visible) disabilities among patients under treatment. This problem arises due to the gradual progression of leprosy symptoms, often without severe initial reactions, leading many patients to become complacent, assuming that they only have skin-related symptoms. This misconception can result in delays in preventing disabilities. (Ngamvachiraporn, 2022). In 2022, leprosy cases for Thailand was 73. Leprosy cases of Thailand fell gradually from 401 in 2008 to 73 in 2022. (Knoema, 2022).

For the above reasons, the students came up with the idea of developing a medium for The Development of 2D animation Material on Self-care of Leprosy Patients for Health Personnel in Rajpracha Samasai Institute Department of Disease Control, Ministry of Public Health, which the students distributed information and material from leprosy or anesthetic dermatitis patients that may have many restrictions on their production, such as production costs, design capabilities, and the ability to deliver appropriate presentations to their target audience, so the students foresaw and had The interest that will develop from print media to animation media because animation media will be able to transfer knowledge, understanding, and promote thinking and work. If the content of the pamphlet is created through the process of transmitting it into knowledge, memory, and understanding, it will also produce good memories, interesting and attractive. The student will develop media for the Rajpracha Samasai Institute, Department of Disease Control, Ministry of Public Health because it is an institution that operates to prevent leprosy at the national level. Make the educator interested to study the development of animation media, and so that the relevant departments, located in the regional section, namely the 12-district The Office of Disease Prevention and the Institute for Urban Disease Control and Prevention, Bang Khen, Bangkok, can be further guided and useful.

2. Purpose of Research

2.1 To develop a 2D animation on the self-care of leprosy patients for public health personnel, Rajpracha Samasai Institute, Department for Disease Control, Ministry of Public Health.
2.2 To determine the quality of 2D animation media on the self-care of leprosy patients, for public health personnel, Rajpracha Samasai Institute, Department for Disease Control, Ministry of Public Health.
2.3 To study the perception of the sample group on the 2D animation media on the self-care of Leprosy patients, for public health personnel, Rajpracha Samasai Institute, Department for Disease Control, Ministry of Public Health.
2.4 To study the satisfaction of the sample group on the 2D animation media on the self-care of Leprosy patients, for public health personnel, Rajpracha Samasai Institute, Department for Disease Control, Ministry of Public Health.

3. Methodology

3.1 Population and Sample Group

The population for this study consisted of public health personnel working under the Ministry of Public Health, with a total of 1,859 individuals. The sample group selected for the study was 30 individuals from the public health personnel in Rajpracha Samasai Institute Department of Disease Control, Ministry of Public Health. The sampling method was acquired through simple random sampling, as determined by the (Thomson, 2012). guidelines.

3.2 Research instruments are utilized to gather data.

The research instruments employed were as follows:

1. A form for assessing the quality of content and media.
2. A form for evaluating sample perception.
3. A form for measuring satisfaction.

3.3 Research Hypotheses

1. The quality of the animation media on the self-care of Leprosy patients, for public health personnel, Rajpracha Samasai Institute, Department for Disease Control, Ministry of Health, the quality was at the good level.
2. The sample had a level of perception from 2D animation media on the self-care of Leprosy patients, for public health personnel, Rajpracha Samasai Institute, Department for Disease Control, Ministry of Public Health was at the high level.
3. The result that the content assessment satisfaction assessment of the sample from 2D animation media on the self-care of Leprosy patients, for public health personnel, Rajpracha Samasai Institute, Department for Disease Control, Ministry of Public Health was at the high level.

3.3 Data Collection

1. Analysis

Study and analyze problems in the design and development of 2D animation media. It was found that the media being used is a brochure. Thereafter study, collect, and analyze content regarding the development of media for the self-care of patients with skin disease, with the aim to prevent disability. The content can be summarized as information covering:

1. The causes of disability in all three parts of the body: eyes, hands, and feet.
2. Exploring methods for self-care to prevent disability in patients with numb skin disease affecting their eyes, hands, and feet.
3. Investigating strategies to prevent disability in patients with skin disease, focusing on their eyes, hands, and feet.
4. Collecting and analyzing data to develop measurement and evaluation tools. This involves gathering information and reviewing relevant documents to establish guidelines for creating a quality assessment model, which includes perception assessment forms and satisfaction assessment forms.

2. Design

The planning and design stages involve utilizing analyzed data as a guideline for character design and structuring the storyline for 2D animation media. This process is divided into two parts:

1. Focusing on the content and quality of 2D animation media aimed at promoting self-care among patients with skin disease. The target audience for this media is public health personnel at the Rajpracha Samasai Institute, Department of Disease Control, Ministry of Public Health.

2. In the process of designing 2D animation media, the researcher determines the format for presenting all content and plans the creation of artwork using computer programs commonly used for design, including image editing programs, image creation programs, video editing programs, and more.

3. Development

Introducing 2D animation media focused on self-care for patients with skin disease, with the intended audience being public health personnel at the Rajpracha Samasai Institute, Department of Disease Control, Ministry of Public Health. The next step involves presenting the proposal to the advisor for content accuracy review and editing. After receiving feedback and suggestions, the content will be refined and improved as follows:

1. Present the 2D animation media, which has been refined and approved by the advisor, to four experts at the Rajpracha Samasai Institute for a thorough content accuracy review and correction. Subsequently, it will be submitted to the same experts for a final assessment of content quality. Following this, the media will be presented to three presentation media experts for an evaluation of the quality of the presentation itself.

2. Enhance the 2D animation media dedicated to self-care for patients with dermatitis, targeting public health personnel at the Rajpracha Samasai Institute, Department of Disease Control, Ministry of Public Health. Collect feedback and recommendations from expert quality assessments to further enhance the media.

4. Implementation

Introducing the revised 2D animation media focusing on self-care for patients with skin disease to the public health personnel at the Rajpracha Samasai Institute. In this phase, the media is tested with a sample group to evaluate the perception and satisfaction of public health personnel at the Rajpracha Samasai Institute, Department of Disease Control, regarding 2D animated content on dermatitis self-care. The Ministry of Public Health selected 30 officials and public health personnel from the Rajpracha Samasai Institute using a simple random sampling method. These individuals, who have voluntarily agreed to participate in the research, will be engaged in viewing the media and providing feedback through perception and satisfaction assessments.

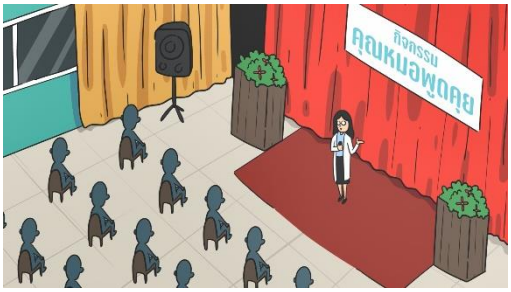
5. Evaluation

When publishing 2D animation media addressing self-care for patients with dermatitis, aimed at public health personnel at the Rajpracha Samasai Institute, data collected from the sample group will be analyzed. The evaluation results will undergo statistical calculations and further summarization of the findings.

5. Result of the Research

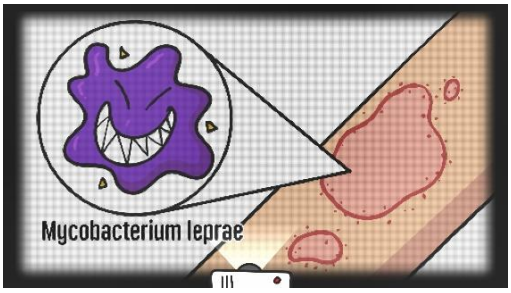
5.1 Results of 2D animation media development

In accordance with the ADDIE Model theory, the researcher has designed 2D animation media on the Self-care of Leprosy Patients for Public Health Personnel in Rajpracha Samasai Institute, Department of Disease Control, Ministry of Public Health.

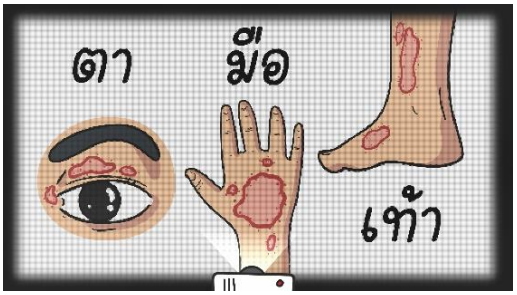


(A) Sub-Picture 2D animation Media

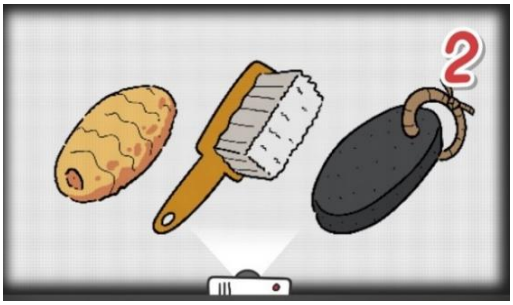
(B) Sub-Picture 2D animation Media



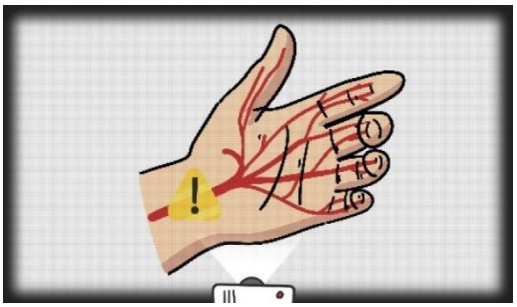
(C) Sub-Picture 2D animation Media



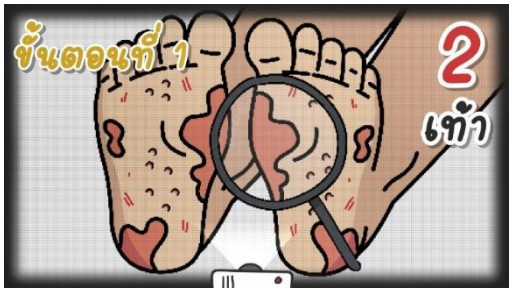
(D) Sub-Picture 2D animation Media



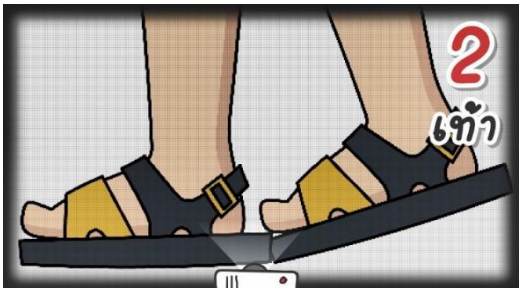
(E) Sub-Picture 2D animation Media



(F) Sub-Picture 2D animation Media



(G) Sub-Picture 2D animation Media



(H) Sub-Picture 2D animation Media

(I) Sub-Picture 2D animation Media

(J) Sub-Picture 2D animation Media

Figure 1. 2D animated on the Self-care of Leprosy Patients for Public Health Personnel

5.2 The results of content and media quality assessments

Table 1. Presents the assessment findings provided by experts in content and media quality

Assessment Topics	Analysis Results		
	$\bar{x}$	S.D.	Level
Content Analysis	4.10	0.84	Good
Media Analysis Result	4.60	0.34	Excellent

1. The content quality was assessed by four content experts. The evaluation revealed that the content quality was rated as good ($\bar{x}$= 4.10, S.D. = 0.84) aligning with the hypothesis of the study.
2. The media quality was evaluated by three media experts. The assessment indicated that the media quality was rated as very good ($\bar{x}$ = 4.60, S.D. = 0.34) in line with the hypothesis of the study.

5.3 The results of the perception assessment conducted on the sample

Table 2. Results of the perception assessment conducted on the sample

Criteria for Perception	Level	
	Amount	Percentage
High level of perception (Score of %80or above)	27	89.67
Moderate level of perception (Score below 60 – 79%)	3	10.33
Low level of perception (Score below 60%)	0	0.00

The sample group underwent a perception assessment consisting of 10 items. The assessment results indicated that the sample obtained an overall perception score of 89.67 percent, which falls within the high level. This outcome aligns with the hypothesis of the study.

5.4 The satisfaction assessment results of the sample group

Table 3. Results of the satisfaction assessment of the sample group

Assessment Topics	Analysis Results		
	$\bar{x}$	S.D.	Level of Satisfaction
Content	4.83	0.38	Highest
Media	4.79	0.53	Highest
Interaction	4.66	0.51	Highest
Application Aspect	4.70	0.55	Highest
Total	4.75	0.45	Highest

The satisfaction assessment results regarding The Development of 2D animation media on Self-care of Leprosy Patients for Public Health Personnel in Rajpracha Samasai Institute Department of Disease Control, Ministry of Public Health. indicated a high level of satisfaction ($\bar{x}$ = 4.75, S.D. = 0.45) Among the different aspects evaluated, content received the highest average rating ($\bar{x}$ = 4.83, S.D. = 0.38) followed closely by media ($\bar{x}$ = 4.79, S.D. = 0.53), and the application aspect ($\bar{x}$ = 4.70, S.D. = 0.55) These findings were consistent with the hypothesis of the study.

6. Discussion

1. The Development of 2D animation Material on Self-care of Leprosy Patients for Public Health Personnel in Rajpracha Samasai Institute Department of Disease Control, Ministry of Public Health. The researcher followed the ADDIE model framework and conducted thorough research from reliable sources. This information was then utilized in implementing various procedures with the objective of preventing disabilities in patients with numb skin disease. The final outcome took the form of 2D animation media, which consisted of content addressing the causes of disabilities associated with Leprosy patients, self-care methods for preventing disabilities in the eyes, hands, and feet, as well as strategies to avoid disabilities specific to these organs. The design process, guided by ADDIE MODEL principles, five design stages: 1. Analytical stage, 2. Design stage, 3. Development stage, 4. Implementation and 5. Evaluation commenced with information and content gathering and culminated in the design and development of the

2D animation media. This finding was consistent with a align with the research conducted by (Rahim et el., 2023). On the development of a two-dimensional animation for business law: elements of a valid contract.

2. Based on the assessment of content quality, based on the assessment of content quality, it was determined that the content section achieved a good level of quality ($\bar{x}$ = 4.10, S.D. = 0.84) This assessment was based on information obtained from the official website of the Rajapracha Samasai Institute and reliable documents, ensuring the reliability and authenticity of the information presented. This finding was consistent with a study conducted by (Kaenmueang et el., 2021). which focused on the development of 2D animation media to promote tourism in Wat Phra That Lampang Luang, Lampang Province. The research process uses a target audience of those interested in tourist attractions in Lampang Province, rely on online travel information and are aged from 15 to 30 years old, the assessment is divided into two parts: first to assess the effectiveness of the media to promote tourism. And the second is to assess the production quality of the media. The results of the content analysis showed were found to be at a good level.

3. Based on the media quality assessment, it was determined that the evaluation of the media was at a very good level ($\bar{x}$ = 4.60, S.D. = 0.34) This positive evaluation can be attributed to the appealing positioning of characters in the 2D animation media. Graphics were effectively utilized to convey information in a clear and comprehensible manner. The use of images and graphics was consistent with the content, ensuring coherence. Additionally, the background music was well-suited to the media, contributing to an overall excellent portrayal of the presentation. the findings of this study align with the research conducted by (Munib et el., 2022). on the development of 2D animation Learning Media Akhlakul Karimah Materials. The results indicated that validation Media expert validation gave a value of 87.4 very valid criteria.

4. The evaluation of perception towards 2D animation media showed that the sample group had a high perception level of 89.67 percent, which shows that the quality of 2D animation production affects perception of the sample group. This outcome aligns with the hypothesis of the study.

5. The satisfaction assessment of the sample group was at the highest level of satisfaction. ($\bar{x}$ = 4.74, S.D. = 0.45). This assessment took into consideration the needs of the Rajapracha Samasai Institute. patient care and the progress of developing 2D animation media on the self-care of Leprosy patients, for public health personnel, Rajpracha Samasai Institute, Department for Disease Control, Ministry of Public Health. The periodic presentation of progress ensured that the animation media aligned with the institute's requirements, resulting in the highest level of satisfaction. This finding was consistent with (Abdul Jalil et el., 2023) research on the documentation of COVID-19 pandemic in Malaysia using 2D animation. The study found survey, 70% from the respondents were satisfied with the information provided in the animated series.

Acknowledgement

The author is grateful to Rajpracha Samasai Institute, Department of Disease Control, Ministry of Public Health, who allowed and assisted in collecting the content quality assessment, animation media perception assessment, and satisfaction assessment.

Authors' information

Kamonwan Buranut is an author project, the development of 2D animation media on the self-care of leprosy patients for public health personnel in Rajpracha Samasai Institute, Department of Disease Control, Ministry of Public Health

Peangpen Jirachai is an assistant professor and lecturer in the Division of Educational Communications and Technology (ECT), Faculty of Industrial Education and Technology, King Mongkut's University of Technology Thonburi, Thailand

References

Sasakawa, Y. (2021). Leprosy mustn't be forgotten amid Covid crisis. Retrieved December 23, 2021, from: https://www.bangkokpost.com/opinion/opinion/2124787/leprosy-mustnt-be-forgotten-amid-covid-crisis

Chua-Intra, B. (2021). 60 Years of Raj Pracha Samasai with the success of leprosy elimination according to the royal initiatives, 1957-2020. Disease Control Journal,47(3), 492-495. https://doi.org/10.14456/dcj.2021.44

Rajpracha Samasai Day from The Majesty King Bhumibol Adulyadej King Rama IX. (2021). Retrieved September 2, 2021, from: https://www.silpa-mag.com/this-day-in-history/article_44185
Sootisak Ngamvachiraporn. (2021). Assessment of the reporting quality of leprosy in general hospital laboratories and Center for Leprosy Excellence (NODE) in Thailand. Samutprakarn: Rajpracha Samasai Institute, Department of Disease Control.
Thailand - Leprosy reported cases. (2022). Retrieved November 12, 2022. from: https://knoema.com/atlas/Thailand/topics/Health/Communicable-Diseases/Leprosy-cases
Thompson, V.S. (2012). Simple Random Sampling, John Wiley & Sons, Inc., https://doi.org/10.1002/9781118162934.ch2
Vulpen, E. (n.d.). Understanding the ADDIE Model: All you Need to Know. Retrieved from: December 23, 2021. Available from: https://www.aihr.com/blog/addie-model/
Rahim, S.S., Seleh, H., Faizal, N.Z.F., & Parumo, S. (2023). Development of a Two-dimensional Animation for Business Law: Elements of a Valid Contract. International Journal of Advanced Computer Science and Applications,14(7), 202-206. https://doi.org/10.14569/IJACSA.2023.0140722
Kaenmueang, W., Boonsri, P., Komplong, R. (2021). The Development of 2D Animation media to promote tourism in Wat Phra That Lampang Luang, Lampang Province. Conferences: 2021 Joint International Conference on Digital Arts, Media and Technology with ECTI Northern Section Conference on Electrical, Electronics, Computer and Telecommunication Engineering, 3-6 Mar, Section IV. Retrieved from https://ieeexplore.ieee.org/document/9425765/metrics#metrics
Munib, A., Utomo, N.B. (2022). Development of 2D Animation Learning Media Akhlakul Karimah Materials (Ukhuwah and Husnudzon). International journal Edukasi,16(2), 140. Retrieved from https://journal.unnes.ac.id/nju/index.php/edukasi/article/viewFile/41559/13754
Jalil, N.A.A. (2022). The Documentation of COVID-19 Pandemic in Malaysia using 2D Animation. Journal of Computing Technologies and Creative Content,7(1), 36. Retrieved from https://jtec.org.my/index.php/JTeC/article/view/506