

DEVELOPMENT OF 3D ANIMATION TO PROMOTE MOTIVATION FOR PHYSICAL ACTIVITY

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ABSTRACT

Regular physical activity affects physical and mental health to increase for strength, reduce the rate of illness. Therefore, it is necessary to jointly promote and motivate teenagers to see the importance of physical activity. The aim of this research is to 1) development of 3D animation to promote motivation 2) study the level of motivation of the sample audience to watch 3D Animation. The sample group was 134 from high school students in the academic year 2021, using purposive sampling and snowball sampling, evaluate animation potential through the online system. The study found that 1) overall 3D animation evaluation by experts has average of 4.13 at a high level 2) overall 3D animation evaluation by sample group has average of 4.42 at a high level

Keywords: Physical activity, 3D animation, Effective of 3D animation, Animation

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1. INTRODUCTION

Regular physical activity affects physical and mental health to increase for strength, reduce the rate of illness and premature death with rate is approximately 20%-30% in a group of 25 patients with chronic illnesses. There is advice from international organizations, that everyone should get regular moderate exercise about 150 minutes per week. [1] Public health policies in each country encourage people of all ages to exercise to bring health benefits to oneself. [2] Results from research found that physical activity or aerobic dancing in childhood, it is beneficial to brain structure, brain function, cognition, and academic achievement. Healthier children are said to have larger brain volumes in the basal ganglia and hippocampus, it is associated with high efficiency in controlling perception and memory, to compared to children with lower physical strength because of lack of exercise. [3] Therefore, physical inactivity is a risk factor for overweight or obesity and certain types of cancer. It also affects the economic costs of the country that must invest in public health budgets.

From research data from children and youth groups , provide consistent information that exercise is important and helps develop motor skills bone, strength physical fitness respiratory, efficiency and blood circulation, helps control overweight [4] and relieve asthma symptoms. [5]

From the efficiency of using media to apply together with organizing activities in both teaching and learning and other additional activities such as [6] Research to develops animation to solve physics learning problems, topic Newton's Laws that describes the direction of force acting on an object and create motivation for students' learning. Results was found that the average score for learning motivation was 70 percent at a high level. Research and development of animation for solve problems in studying chemistry which caused by subject whose content is difficult to understand. The results of the research concluded that students who taught chemistry with the use of animation, average scores were higher than those of students taught using traditional methods. [7] From the study of the efficiency of applying animation in conjunction with teaching activities, helps improve learning achievement. Therefore, objective research to develop 3D animation to promote motivation for teenagers, awareness of the importance of physical activity and should be practiced regularly to have good physical and mental health.

2. RELATED DOCUMENTS AND RESEARCH

- Development of animation-based learning media to increase student's motivation in learning physics [6]. The cause by physics subject have difficult content and effect to low impact on students' motivation to study subject. Therefore, animation media has been developed for use in teaching. The aim is to develop animation materials that make it easier for students to understand Newton's laws. The sample group was 60 students. Explanatory animation Newton's Laws content displayed as an animation. Animation were assessed using a 5-level rating scale questionnaire. Assess students' learning motivation in 3 topics: hands-on learning, value of learning science and academic achievement, result all aspects of the evaluation were at a very good level.

- Effect of Computer Animation on Chemistry Academic Achievement of Secondary School Students in Anambra State, Nigeria. [7] The objectives are: 1. To compare the academic achievement of students who study chemistry taught with animation and those who study using traditional methods. 2. to compare the differences in academic achievement of male and female students whose learning with animation. The results of the research concluded that 1) students who taught chemistry concepts with animation, they have higher average achievement scores than students who are taught using traditional methods, 2) male students have higher academic achievement in chemistry than female students.

- Development 3D Animated Story as Interactive Learning Media with Lectora Inspire and Plotagon on Direct and Inverse Proportion Subject [8] In the 21st century, teachers need to have knowledge combined with technological pedagogical content knowledge (TPACK). This research develops 3D animations for mathematics teaching activities to be a learning in the problem-based learning model, content topic is direct proportions and inverse proportions. It has a validity coefficient of 0.86. In conclusion, 3D animation designed to learn problem-based patterns to helps students understand how to solve problems of finding direct proportions and inverse proportions, average academic achievement score of 88.84%.

3. RESEARCH METHODS

3.1 RESEARCH TOOLS

1) 3D animation to promote motivation for physical activity

2) 3D animation quality assessment form to promote physical activity motivation for 3 animation experts. The evaluation form passed the quality inspection of the index of compliance (IOC) tool with an reliability value of 0.84.

3) audience evaluation form to assess 3D animation physical activity motivation. The evaluation form has a reliability value of 0.83.

3.2 TARGET GROUP

The sample group was 134 from high school students in the academic year 2021, using purposive sampling and snowball sampling, evaluate animation potential through the online system.

3.3 RESEARCH PROCESS

3.3.1 ANIMATION PRODUCTION PROCESS

PRE-PRODUCTION

1. research issues regarding the content of aerobic exercise because it is accepted by academics and medical professionals as exercise that affects the lungs, heart, blood vessels, as well as the circulatory system throughout the body and make your body strong and function as efficiently as possible.

2. analyze the content studied Used to design the plot story, the action script that will be able to communicate and tell the story in an interesting way to the target audience which is teenagers for communication with 3D animation.

3. character and background design which communicate to the audience. In this case, there is a teacher character to provide information and knowledge about benefits of aerobic exercise and student characters performing aerobic exercise demonstrations.

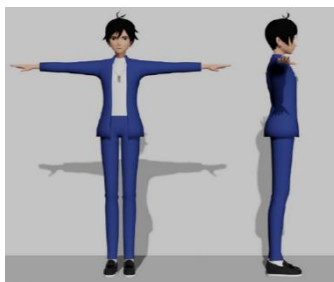


Figure 1: Design teacher character

From Figure 1 : Design teacher character to acting as a physical education teacher to the presenter of knowledge content about exercise.

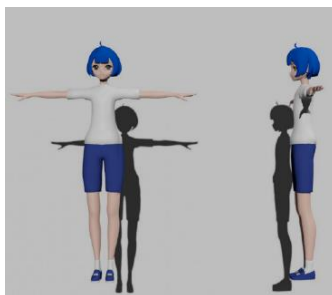


Figure 2: Design student character

From Figure 2 : Design student character to acting as a physical education to demonstrate exercise

4. create a storyboard to design the narrative sequence for to check the overall content. Modified and then entered the production process.

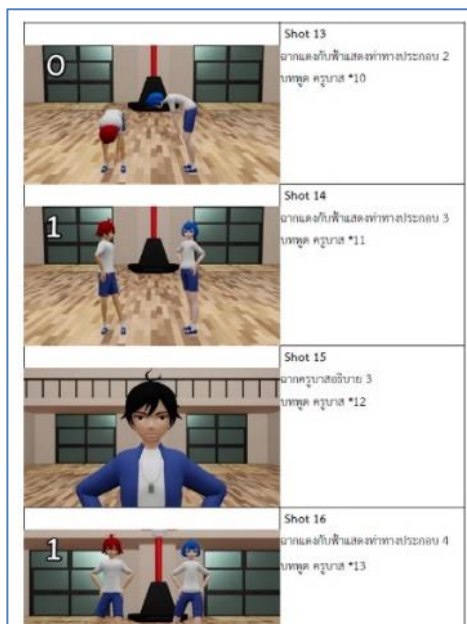


Figure 3: Storyboard 3D animation

PRODUCTION

1. create a character model to take the designed characters and create models with an animation program. To add bones and then paint the surface or texture and to create movement or rigging such as moving the mouth, turning the head, moving the arms and legs.



Figure 4: Create a character model with a 3D program

2. make animation characters that have already been created and make them into animations program



Figure 5: Create movement for cartoon models

3. dubbing and recording voiceovers according to the specified script. To contact an expert voice actor with suitable for that character to record the voice according to the script and save it as a file.

POST-PRODUCTION

Check the quality of the animation work by the producer, checking the overall consistency of the work and according to storyboard sound level in each section. Consistency in the rhythm of mixing voiceovers, narration, sound effects, and graphics.



Figure 6: Sequencing images and mixing sounds

3.3.2 CREATE A RESEARCH TOOL

1. study research documents on motivation with 3D animation production is analyzed to determine questions in the media evaluation form.
2. the media evaluation form for both the expert group and the sample group. Presented to 3 experts to evaluate and check content validity, analysis of the Index of conformity (IOC) and select and use only questions with a value greater than 0.5.
3. take the media assessment form group of experts and the sample group to try out for reliability with Cronbach's alpha coefficient. The reliability value of the expert assessment was 0.84 and reliability of the assessment for the sample was equal to 0.83.

3.3.3 COLLECT DATA IN RESEARCH

1. expert evaluate 3D animations with using Likert Scales questionnaires
2. contact and coordinate requesting cooperation from network schools for evaluate 3D animations which purpose sampling and snowball sampling to evaluate media via online platform.
3. statistical analysis evaluation results of 3D animation media to summarize and discuss results.

Protecting the rights of sample groups

1. before evaluating the media to explanation for the sample group to know and decided to join in evaluating online 3D animation media.
2. dissemination of information is presented as a whole and do not publish individual information.

4. RESEARCH RESULTS

Criteria to interpret scores to use the tiering approach according to BEST's concept. [10]

- 4.50 - 5.00 = highest level
- 3.50 - 4.49 = high level
- 2.50 - 3.49 = moderate level
- 1.50 - 2.49 = low level
- 1.00 - 1.49 = least level

3D animation questionnaire to promote motivation for physical activity for expert group divided into 2 topics : 1) using 3D animation to create motivation to motivation for physical activity
2) create 3D animation production techniques

Table 1: Animation evaluation by experts, using 3D animation to create motivation to motivation for physical activity

using 3D animation to create motivation to motivation for physical activity	(\bar{X})	(S.D)	Level
1. proceedings be creative and present a new perspective.	3.67	0.58	high
2. after watching the media, viewers agreed that exercise should be done regularly.	4.33	0.58	high
3. after watching the media, viewers saw the importance of exercise.	4.67	0.58	highest
4. after watching the media, viewers will use the exercise moves they have learned.	4.33	0.58	high
Average	4.25	0.58	high

From table 1 : Animation evaluation by experts : using 3D animation to create motivation to motivation for physical activity at the high level, average was 4.25.

Table 2: Animation evaluation by experts, create 3D animation production techniques

create 3D animation production techniques	(\bar{X})	(S.D)	Level
1. design character characters suitable for the role	3.33	0.58	moderate
2. use camera angles appropriate for the demonstration presentation to follow	4.33	0.58	high
3. the movement of each part (Rigging) of the character's posture is realistic	3.67	0.58	high
4. the sequence of images and sound are consistent	4.67	0.58	highest
Average	4.00	0.58	high

From table 2 : Animation evaluation by experts : create 3D animation production techniques at the high level, average was 4.00.

Table 3: Animation evaluation overall by experts

Topic to evaluate 3D animation	(\bar{X})	(S.D)	Level
1) using 3D animation to create motivation to motivation for physical activity	4.25	0.58	high
2) create 3D animation production techniques	4.00	0.58	high
Average	4.13	0.58	high

From table 3 shows the overall 3D animation assessment by experts, has an average of 4.13 at high level. Consider each aspect in the following order: 1) using 3D animation to create motivation to motivation for physical activity has an average of 4.25 and 2) create 3D animation production techniques has an average of 4.00, which is a high level.

Table 4: Animation evaluation by sampling group, using 3D animation to create motivation to motivation for physical activity

using 3D animation to create motivation to motivation for physical activity	(\bar{X})	(S.D)	Level
1. proceedings be creative and present a new perspective	4.20	0.40	high
2. after watching the media, viewers agreed that exercise should be done regularly	4.58	0.50	highest
3. after watching the media, viewers saw the importance of exercise	4.53	0.60	highest
4. after watching the media, viewers will use the exercise moves they have learned	4.62	0.49	highest
Average	4.48	0.50	high

From table 4 : Animation evaluation by sampling group: using 3D animation to create motivation to motivation for physical activity at the high level, average was 4.48.

Table 5: Animation evaluation by sampling group, create 3D animation production techniques

create 3D animation production techniques	(\bar{X})	(S.D)	Level
1. the characters are suitable for their acting roles	4.20	0.40	high
2. the exercise postures are designed to be simple and easy to follow	4.54	0.50	highest
3. the movement of each part (Rigging) of the character's posture is realistic	3.86	0.65	high
4. the sequence of images and sound are consistent	4.80	0.40	highest
Average	4.35	0.49	high

From table 5 : Animation evaluation by sampling group: create 3D animation production techniques at the high level, average was 4.35.

Table 6: Animation evaluation overall by sampling group

Topic to evaluate 3D animation	(\bar{X})	(S.D)	Level
using 3D animation to create motivation to motivation for physical activity	4.48	0.50	high
create 3D animation production techniques	4.35	0.49	high
Average	4.42	0.50	high

From table 6 shows the overall 3D animation assessment by sampling group, has an average of 4.42 at high level. Consider each aspect in the following order: 1) using 3D animation to create motivation to motivation for physical activity has an average of 4.48 and 2) create 3D animation production techniques has an average of 4.35, which is a high level.

5. DISCUSSION OF RESEARCH RESULTS AND SUGGESTIONS

5.2.1 DISCUSSION OF RESEARCH RESULTS

1. To selecting content for present to the target groups which communicate for teenagers and adults is very important and different interests. This research analytic and select content has beneficial for audience and can be use the media for teaching and learning about the topic of exercise which related subjects. So that evaluation 3D animation at a high level and results of this research are consistent with other research. [10]

2. Benefits from this research It is the design and development of 3D character work in the first phase, the next phase to useful for design movement the characters which focus on moving the rhythm of the body movements to be realistic according to physics principles as well, such as flexibility, up and down rhythm of the characters according to their weight. So that 3d animation can be used as an interesting media for both general and special children. [14] [15]

3. Animation media use apply to teaching activities and various activities organized have an effective on creating motivation to awareness of the content communicated has increased, consistent with many research studies. [4] [8] [11] [13]

4. From the results of media testing from this research consistent with other research [12], creating 3D animation is different from 2D animation in that must be study to anatomy very well for design realistic movement of the characters. The importance with attention to the principles of art elements, 3D design principles and aesthetic principles for communicate images with meaning and realism.

5.2.2 SUGGESTIONS FOR RESEARCH

1. Creating 3D animation requires an understanding of the character's movement space. Especially the movement of the joint parts, such as expressing facial expressions and moving the face with mouth and eyes to make the work design soft and realistic.
2. Must be to understand camera angles and direction of light to be used to design and create each scene with dimensions, lighting, mood & tone to encourage viewers to become more involved.

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