

3D ANIMATION DESIGN "SCIENCE, LANTERNS TO HEAVEN" USING POSE-TO-POSE METHOD

Desy Apriliyanti ^{1*)}; Juniardi Nur Fadila ²; Fresy Nugroho³

Informatics Engineering ^{1,2,3}
Universitas Islam Negeri Maulana Malik Ibrahim Malang
<http://informatika.uin-malang.ac.id/>
19650007@student.uin-malang.ac.id^{1*)}, juniardi.nur@uin-malang.ac.id², fresy@ti.uin-malang.ac.id³

(*) Corresponding Author

Abstract— In today's era, technology and communication have experienced very rapid development. Islamic values raised through the media is an effort in people's lives today. Including through the media of 3D animated films that rely on entertaining audio-visuals and messages conveyed through animated films can also be easily captured by the audience. In addition, the selection of animated films is based on the number of animated films circulating on social media such as YouTube and other electronic media, this film can actually affect the attention of many people. Animated film designed by the author with the theme of the importance of studying which can lead to Allah SWT's heaven. Making this animated film will use Blender software version 2.80. The method used is "Pose-to-Pose" by determining each keypose movement in order to produce a good movement. Using this method makes the work more effective or faster and if there is an error in the pose, it can be easily corrected. The design of the 3D animated film entitled "Science, Lantern Towards Heaven" is expected to be useful for the audience and take the moral message in it, which is to increase enthusiasm in learning or studying.

Keywords: 3D Animation, Pose to Pose, blender, Islamic, Science.

Abstrak— Pada era sekarang ini, teknologi dan komunikasi sudah mengalami perkembangan yang sangat pesat. Nilai keislaman yang diangkat melalui media merupakan suatu keberuntungan di kehidupan masyarakat sekarang ini. Termasuk melalui media film animasi 3D yang mengandalkan audio-visual yang bersifat menghibur dan pesan yang disampaikan melalui film animasi juga dapat ditangkap dengan mudah oleh penonton. Selain itu, pemilihan film animasi didasarkan pada semakin banyaknya film animasi yang beredar di sosial media seperti youtube maupun media elektronik lainnya, film ini ternyata dapat memikat perhatian banyak orang. Film animasi yang dirancang oleh penulis bertemakan pentingnya dalam menuntut ilmu yang bisa membawa menuju surga-Nya Allah SWT. Pembuatan film animasi ini akan menggunakan software Blender versi 2.80. Metode yang digunakan adalah "Pose-to-Pose" yaitu dengan cara menentukan setiap keypose gerakannya agar menghasilkan gerakan yang baik. Penggunaan metode ini membuat pengerjaan menjadi lebih efektif atau lebih cepat dan jika terdapat kesalahan pose, dapat dengan mudah diperbaiki. Perancangan film animasi 3D yang berjudul "Ilmu, Lentera Menuju Surga" diharapkan penonton dapat terhibur dan mengambil pesan moral di dalamnya yaitu meningkatkan lagi semangat dalam belajar atau menuntut ilmu.

Kata Kunci: Animasi 3D, Pose to Pose, Blender, Islami, Ilmu.

INTRODUCTION

The development of information technology is now growing so rapidly that the use of information technology develops as well. One of the results of the development of information technology is multimedia [1]. The use of multimedia technology can produce an animation that in its development is complicated and requires the perseverance of an animator. Especially since the development of animation from 2D to 3D animation

makes the development of information technology more rapid. [2]

In the production of a 2D animated film and 3D animation, animating is an important process with the final appearance of an animated motion series [3]. The use of a large number of images can produce animation with good quality and smoother animation movements. The audience will not be interested and it is difficult to capture the story told in an animation if the movement looks stiff and less realistic [4]. Animators need to understand the

basic principles and methods used in animating to produce good quality animation motion.[5]

The methods used by animators in creating animation are numerous, one of which is the pose-to-pose method [6]. The pose-to-pose method can make the animating process work well because it has several advantages compared to other methods. The advantages of this method are faster work time, well-conceptualized animated motion, and corrections made to the wrong pose can be done easily.[4]

The creation of the 3D animation "Science, Lanterns To Heaven" is more intended for children to see. In this day and age, children are often lazy to learn because of the frequent playing of games. So, this animation is made which is expected so that children can capture the message conveyed, namely diligence and passion in learning, can manage time, and obey the words of parents. In addition, the creation of this animation also aims so that children can remember prayers before learning easily. Delivered in the form of animation because in the age of children the spectacle that they are very fond of is animated films. In addition, this animated film is also good for the imagination needed and good for the development of children.[7]

Based on the background described by the author above, the animation is made that is as interesting as possible so that more fans and not boring, and the message that the author wants to convey can be captured by the audience. This animation is created using blender software 2.8 and the method used is pose-to-pose.

3D animation is a development of 2D animation. 3D animation is a dimension that has space so it is commonly called building space [8]. There are 3-dimensional elements, namely length, width, and height. The difference with 2D animation is that 2D animation can only be moved to the right and left sides, up, and down. While 3D animation can be moved in a direction that is to the right and left side, up, down, forward, and also backward [9]. The stage of creating 3D animation starts from modeling to rendering.[8]

Animation work using the pose-to-pose method starts from the overall planning of the movement to be made animation and then after that the determination of each key pose or key pose in each character's movement. A key pose is also referred to as the main movement, which is a collection of initial movements or poses that indicate a particular movement. After the key pose is completed, the next is to combine the movements between existing poses by inserting a pose between two poses or images commonly called the breakdown key. Then, so that the movement results are smoother, inserted another image between the

breakdown key and key pose commonly called in between.[11]

The Qur'an is a guide to life for mankind in which there are various instructions. One of them is a guide to study. In Surah al-'Alaq verse 1 it is mentioned that "the study is an obligation for a Muslim." There is no age limit for a person to study. In addition to an obligation, in the hadith of Muslim history no. 2699 it is also mentioned that "whoever takes the path to seek knowledge, Allah will make it easy for him the way to paradise" [12]. From the verses and hadiths, it has been explained that demanding knowledge is very important which is an obligation for Muslims and facilitates the way to the paradise of Allah SWT.

MATERIALS AND METHODS

There are three stages in the flow of research methods to get the final result, must be interrelated all the parts in the workflow commonly called the pipe line, the stage starts from pre-production, production, and lastly is post-production [13]. This stage is presented in figure 1.

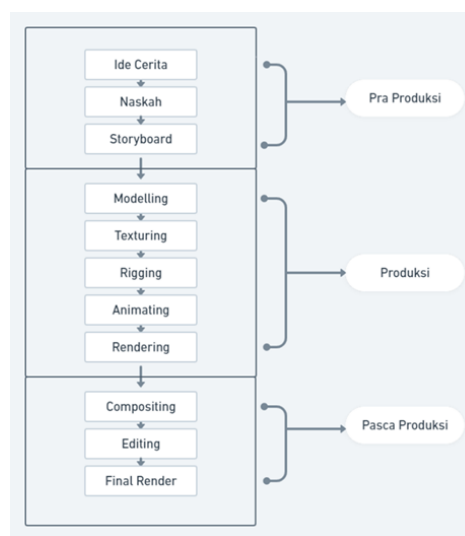


Figure 1. Research Method Diagram

1. Pre-Production Stage

The pre-production stage is the initial process in the creation of a 3D animation. Here's an explanation of the pre-production stages:

Story Ideas

This phase is the phase where the animator creates an idea from a 3D animated story that will be created later. This phase aims to make the storyline clear [14]. To get a story that is creative and interesting, a good story concept is needed by looking for as many references as possible. The process in this phase starts from making a story concept, then taken in outline and then written in

detail including the selection of a character, conflict issues to be raised in the story, and the purpose of the animated story to be created. [15]

Script

Scripting is one of the important things in the process of making 3D animation because the script is the main foundation of a storyline. This script aims to help in the process of portraying the entire course of the story. The content of a script is there are conversations, conditions, narratives, scenes, and also time. [16]

Storyboard

After the script, the next step is to create a storyboard. Storyboards are based on a previously created script, used to make it easier for an animator to create an animated clip [17]. A storyboard contains a series of images that are usually accompanied by directions or dialogue that explain the image with images arranged in sequence according to the scene that has been written on the script. [14]

2. Production Stage

The production phase is the core process of creating 3D animation. This stage is the stage of the start of the construction of a project in which it comes into contact with 3D [18]. Here is an explanation of the stages of production:

Modeling

The modeling stage is used to create an object [6]. Modeling using a blender in the creation of 3D animations is done per character, asset, and environment. Modeling on a blender can be done using a mesh tool that is already available with the shortcut shift + a, then choosing the required mesh object [19].

Texturing

The texturing stage is the stage that is done after the modeling process is completed. This stage is the process of creating and giving color and texture to objects that define the appearance and type of material of the 3D object to make it look more real [20]. One of the techniques used in texturing in blenders is the UV Mapping and Texture Painting techniques. These techniques serve to add detail, surface texture, and color to the object so that the technique can make the coloring of 3D objects more real [21]. In the blender, there is a material mode feature in which contains several methods for the texturing process.

Rigging

The Rigging stage is the stage of giving armature to a 3D object that has been modeled so

that the object can later be moved and look real [10]. The function of the armature is the same as the function of bones in humans, and the structure of the given armature is also the same as the structure of the human bone. Rigging here will facilitate the animating process later. How to add armature to a blender is to press space, then add, and then choose armature. [22]

Animating

The animating stage is the stage of moving 3D objects. The movement is adapted to a pre-designed scenario [22]. At this stage, the whole process uses the pose-to-pose method starting from the determination of the key pose, then extreme, and finally for its refinement is in between [15]. So animators using this method only draw certain keyframes only. This method animates the images one by one, both for frame by frame and keyframe.[23]

Rendering

The rendering stage is the stage to produce an output in the form of an image or movie [24]. [24]. This process will produce an overall image of all animated scenes that have been designed in previous processes including for the laying of light, shadow, color, and others [16]. The main key to the rendering process is the balance between the visual complexity required with the speed of rendering that conveys the number of frames that can be rendered at any given time. [25]

3. Post-Production Stage

The post-production stage is the last stage in the creation of 3D animation containing compositing, editing, and final rendering. Here's an explanation of the post-production stages :

Compositing

The compositing stage is a stage that contains the process of filling the voice of a character or commonly called dubbing. At this stage the voice actor or commonly known as the dubber will record the voice based on the dialogue that has been made before and adjusts to the mouth movements of the animated characters that have been made.

Editing

The editing stage is the merging stage of the animation rendering results in the previous process so that it becomes a 3D animated film. At this stage will also add supporting sound effects and other interests to complement an animated film to be made. In addition, in this editing stage, the editor will also check the suitability of the results with the

existing storyboard before entering the last stage, namely the final rendering [19].

Final Render

Final rendering is the final stage in creating 3D animation. The output of the film can be selected according to the needs ranging from small to large. The greater the measure of the file, the better the quality of the video produced [8]. After the final stage of rendering is completed, it means that 3D animations that have been created can be published and watched.

RESULTS AND DISCUSSION

The animated short film entitled "Science, Lanterns to Heaven" has 2 characters, namely Rehan as a child and Umami as Rehan's Mother. The background of the place used in this animation consists of 2 places, namely in front of the house and in Rehan's bedroom. As for the time used is at night. In addition, this animated short film also added some assets that support the background of the place used such as chairs, tables, mattresses, cabinets, and others.

1. Pre-Production

Story Ideas

The author's story idea used in the making of an animated short film titled "Science, Lanterns to Heaven" is based on two hadiths that say that a Muslim must study that can facilitate the path to paradise of Allah SWT. And based on the number of children in this day and age with advanced technology such as mobile phones that make them often spend a full day just playing mobile phones. Games or social media on mobile phones make children forget their obligation to learn in studying so that this animation is made so that it is realized the importance of studying and can divide the time between learning and playing mobile phones. This animation also included prayer before learning so that children can remember that before learning do not forget to read the prayer to be facilitated in capturing lessons and focus and avoiding the temptations of Satan, in addition to making it easier for children who have not memorized prayers before learning.

Script

Broadly speaking, the animated short film titled "Science, Lanterns to Heaven" tells the story of a child who plays mobile phones until he stops playing mobile phones after being advised by his mother who realizes that he has spent a lot of time playing games to forget about learning.

NASKAH

FILM PENDEK ANIMASI ISLAMI 3D

"Ilmu, Lentera Menuju Surga"

Diceritakan bahwa seorang anak yang malas untuk belajar karena asyik bermain *game*. Pada suatu malam, seorang anak laki-laki bernama Rehan sedang asyik bermain *handphone* di dalam kamar hingga lupa belajar. "Ayoo ayoo serang!!! Tembak tembak musuhunya, hahaha seru banget *game* ini," ucap Rehan ketika bermain *game* dengan nada keras hingga terdengar dari luar kamar. Ibunya yang biasa dipanggil Rehan dengan sebutan Umami datang menghampiri Rehan. Sambil menunjuk jam dinding yang sudah menunjukkan pukul 7 malam, Umami meminta Rehan untuk berhenti bermain *handphone* karena sudah waktunya untuk belajar. "Rehan, sekarang sudah jam 7 dan waktunya untuk belajar," ucap ibunya Rehan. "Iya, Umami. Sebentar lagi ya hehe masih seru banget nih Umami," jawab Rehan yang meminta waktu sebentar lagi untuk bermain karena terlalu asyik dengan *handphone*-nya. Mendengar jawaban Rehan, Ibunya langsung menasihati Rehan secara lemah lembut dengan memberitahu beberapa hadist yang telah disebutkan di atas dan menjelaskan pentingnya ilmu. Setelah selesai dinasihati oleh ibunya, Rehanpun meletakkan *handphone*-nya dan bersiap untuk belajar.

Sebelum membuka bukunya, Rehan terlebih dahulu membaca doa sebelum belajar sambil menandakan tangannya. Doa sebelum belajar adalah seperti di bawah ini.

رَبِّ زِدْنِي عِلْمًا وَارْزُقْنِي فِيهَا وَاجْعَلْنِي مِنَ الصَّالِحِينَ

Artinya: "Ya Allah, tambahkanlah aku ilmu dan berikanlah aku rizqi akan kepaahaman. Dan jadikanlah aku termasuk golongan orang-orang yang shaleh". Setelah selesai berdoa, Rehan membuka bukunya dan siap untuk belajar. Ibunya pun meninggalkan kamar Rehan.

Figure 2. Story Script "Science, Lanterns to Heaven"

Figure 2 explains the contents of the story script that will be used as a 3D Islamic animated short film. The script contains a sequence of scenes that will be made into an animation accompanied by an explanation of the setting of the place, time, dialogue, and characters.

Storyboard

The author has compiled a storyboard that is used as a reference in the making of this 3D animated short film. The following is an image from the storyboard of the animated short film titled "Science, Lanterns To Heaven".



Figure 3. Storyboard

The storyboard description in figure 3 above is as follows:

- 1) Scene 1 in the first image as an intro showing the house of Rehan and his mother,
- 2) Scene 2 in the second gambar shows Rehan playing mobile phone,
- 3) Scene 3 in the third image shows Rehan who is engrossed in playing mobile phones,
- 4) Scene 4 in the fourth image shows at 7 p.m.,
- 5) Scene 5 in the fifth image shows his mother telling Rehan to learn and stop playing mobile phones,
- 6) Scene 6 in the sixth picture shows his mother advising Rehan,
- 7) Scene 7 of the seventh image shows Rehan praying,
- 8) Scene 8 in the eighth image shows Rehan studying,
- 9) Scene 9 in the ninth image shows Rehan studying and his mother who is out of the room,
- 10) Scene 10 in the tenth image as an outro showing the return of Rehan and His Mother's house.

2. Production

Modeling

In blender already provided some features for modeling an object, such as scale to resize objects, rotate to rotate objects, and many other features in object mode, layout mode, and edit mode. The following is an image of the results of modeling assets using features in blender software.

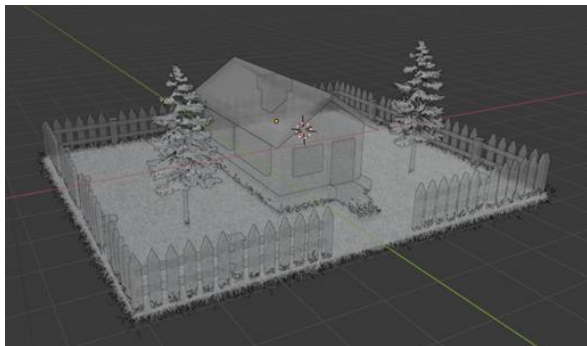


Figure 4. Modeling Home Assets

Figure 4 shows the results of modeling or coding the background of the house and surrounding areas that later in the animation become the first and last scene. Modeling is one of the most important stages in animation creation.



Figure 5. Modelling Bedroom Assets

Figure 5 shows the results of modeling or modeling the background of the bedroom bed and its contents. Modeling of bedroom assets is done in detail because it is the main place in the 3D Islamic animation "Science, Lanterns To Heaven" and almost all scenes of the story scene are set in a bedroom bed.



Figure 6. Modeling Bed Assets

Figure 6 shows modeling or modeling one of the assets in the background of the bedroom bed, which is a bed complete with pillows and blankets. Modeling is done as closely as possible with the original, seen from the modeling of pillows and blankets that are as real as possible.

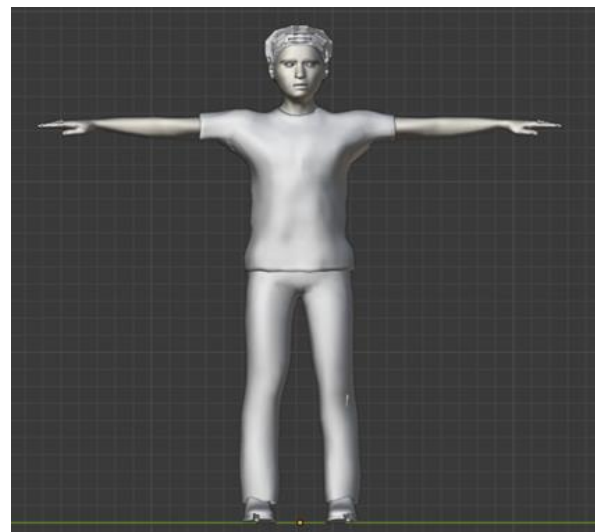


Figure 7. Modeling Male Character Assets

Figure 7 shows the modeling or modeling of one of the animated characters created. Character modeling is done with details from her body to her clothes to look real.

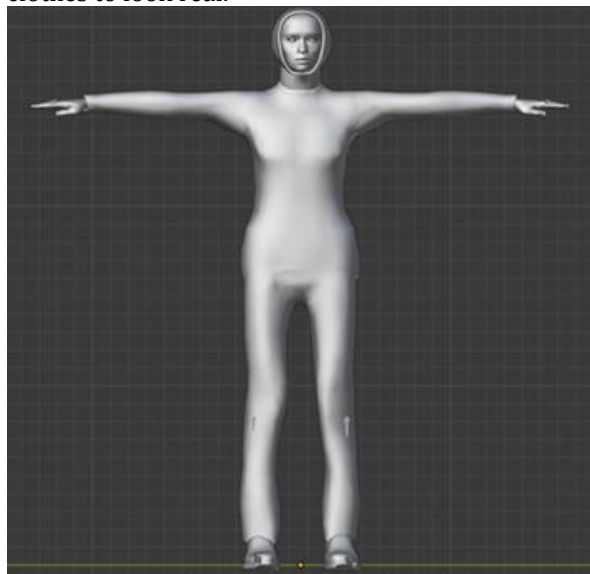


Figure 8. Modeling Female Character Assets

Figure 8 shows the modeling or modeling of one of the animated characters created, namely female characters. Modeling the character on the face is quite difficult because details are needed on the eyes, nose, and others.

Texturing

The blender has been given a feature to texture an object. Texturing can use UV Mapping techniques or use material context tools that are already available in blenders. UV mapping techniques can take some of the textures found on the internet. As for material context tools using basic colors that have been presented in the blender, as well as several other textures. Texturing aims to get 3D objects to become more real. The following is an image of the results of texturing assets using features in blender software.

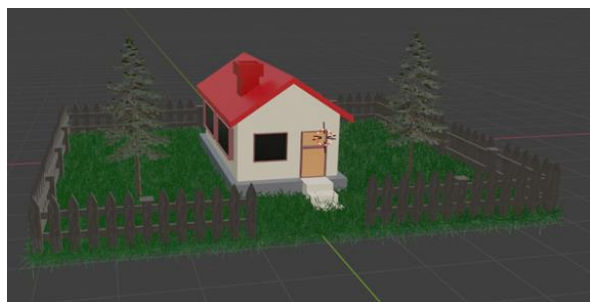


Figure 9. Texturing Home Assets

Figure 9 shows the results of texturing on the assets of the house and its surroundings. Texturing is done after a modeling process that

makes it more alive. Texturing is done with detail on the part of the tree so that it has a real tree-like texture.



Figure 10. Texturing Bedroom Assets

Figure 10 shows the results of texturing on the part of the bedroom. Texturing is done with details of the color of the wood and also the floor because the bedroom becomes the main setting.



Figure 11. Texturing Bed Assets

Figure 11 shows the texturing results of the assets in the room that is the bed. Wooden textured bed and others use basic colors.



Figure 12. Texturing Male Character Assets

Figure 12 shows the results of texturing on male characters. Texturing on a character is quite difficult because it is done in detail on all parts, from skin color, clothing, and others.



Figure 13. Texturing Female Character Assets

Figure 13 shows the texturing results of the Female character. Texturing on a character is necessary to be like the original. Texturing on clothes is done with details such as on the model and fabric on the clothes.

Rigging

Rigging is the giving of bones to a character object to move as real. After that, a controller is given to set his movements. The controller's given is adjusted to how the character moves expected. The giving of bones in this animation has the same function as bones in humans. The following is an image of the result of rigging character objects using features in blender software.

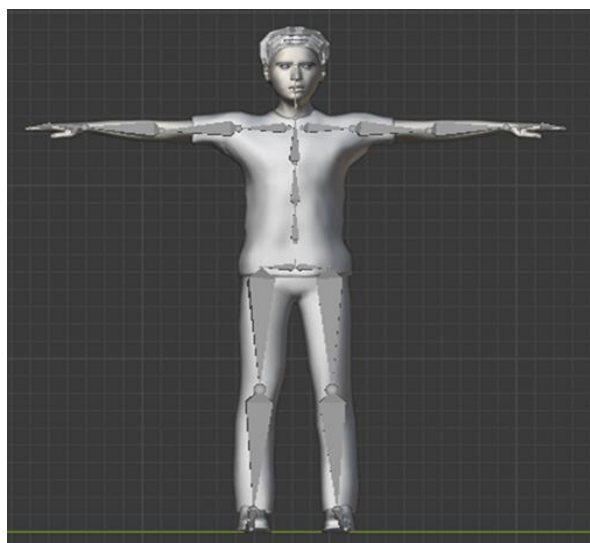


Figure 14. Rigging Male Character Object

Figure 14 shows the results of the male character after the rigging process. Rigging is likened to a human bone so it is done with detail so that it can be moved.

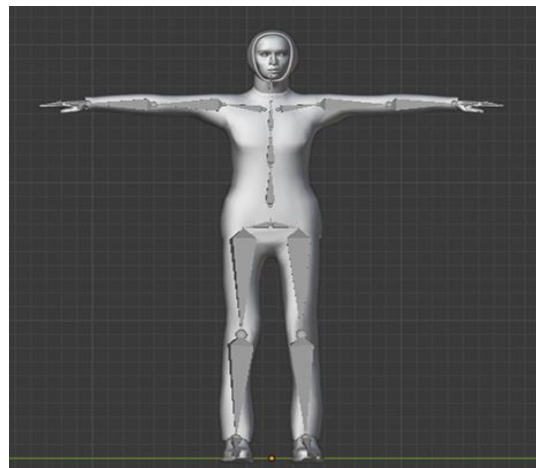


Figure 15. Rigging Female Character Object

Figure 15 shows the results of the Female carcass after the rigging process. Rigging is done on all limbs from head to toe to move like a human.

Animating

Animating is the stage of movement of character objects after the rigging stage before them. The first step taken at the animating stage is to determine the use of frames by using the action editor feature. After that, change from bone mode to pose mode. Then, arrange the movement of bone or bone according to the desired scene. To make it easier, you can search for references from the internet of desired movement scenes as shadows. If the bone has finished set, then click "I" and select "LocRoteScale". The last stage is to set the camera by clicking the camera feature and enabling "Lock Camera to View", then adjust it to what you want. When you're done, disable "Lock Camera to View" and the animation is ready to go to the next stage of rendering. The following is a process image of animating a character object using a feature in the blender software.

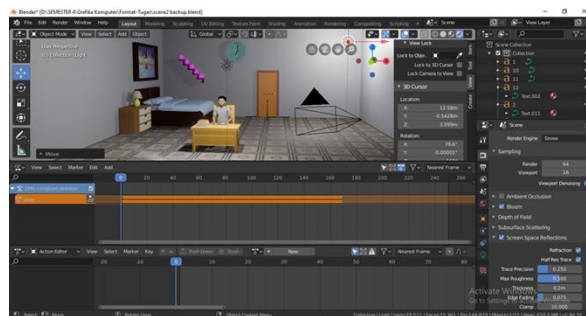


Figure 16. Animating Process

Figure 16 describes the process of animating one of the scenes in the animation created. Animating becomes one of the important and difficult processes because in addition to moving the character, in this process there are also settings from the camera, lighting, and others.

Rendering

Rendering is the last stage of production. There are two types of rendering: rendering images and rendering animation. Image rendering is a rendering that produces an images while rendering animation is a rendering that produces a video. The speed of rendering depends on the number of frames and the specifications of the computer or laptop used. The following is an image of the results of rendering using the features in the blender software.



Figure 17. Rehan Scene Rendering Results

Figure 17 shows the rendering of one of the scenes in the animation made, namely in the scene of a male character or named Rehan who is engrossed in playing games on his phone.

3. Post-Production

Compositing

Compositing is a process of voice filling or commonly called dubbing. Voice charging for animated characters using a voice recorder available on a smartphone is then put into the editing stage. Sound recordings correspond to scripts that have been made at an earlier stage and the sound type is adapted to the animated characters.

Editing

Editing is the combination of rendering in the form of images and videos in editing software. In addition to combining rendering results and incorporating compositing results, this stage can also add filters, text, audio, effects, and more by the features of the editing software used. It aims to make the resulting animation more interesting. The following is an image process from editing using features in the video editing application.

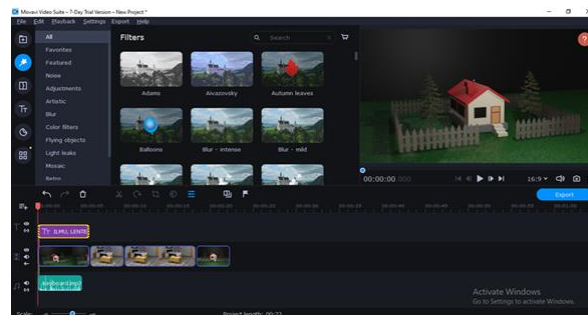


Figure 18. Editing Process

Figure 18 describes the editing process before performing the final rendering. In this editing process in addition to combining several scenes that have been rendered before are also added such as music, dubbing, filters, and others.

Final Render

Final rendering is the last stage in the post-production stage and is also the last stage in the making of a 3-dimensional animated short film. Final rendering is done if the editing stage has been completed by exporting it into mp4 form. The completion of the final stage of rendering means that the filming of the 3-dimensional animated short film "Science, Lanterns To Heaven" has been completed and is ready to be published and watched. The following is an image of the process of final rendering on the video editing application.

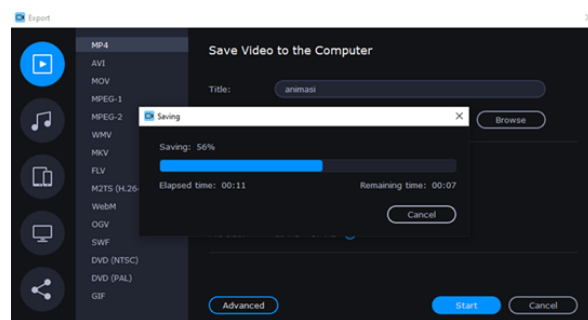


Figure 19. Final Render Process

CONCLUSION

This Islamic-themed 3-dimensional animated short film entitled "Science, Lanterns To Heaven" conveys the importance of studying. The process of making this 3-dimensional animated short film goes through three stages, namely pre-production, production, and post-production. The process of making this animation starts from the determination of the idea of the story to the final rendering and a complete animated film is formed. The method used in this 3-dimensional animation is posed to pose so that the resulting animation looks

smoother and natural so that the message you want to convey can be captured by the audience well.

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