# Immersive Film Toolkit

A Guide to Creating Learning Experiences Through Immersive Media



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## What is Virtual Reality?

Virtual Reality, VR for short, is the use of digital technologies to create a simulated environment. This medium is usually experienced through a wearable device called a Virtual Reality Headset, which is worn on the head and provides an immersive audio-visual experience.



### Why should I use Virtual Reality?

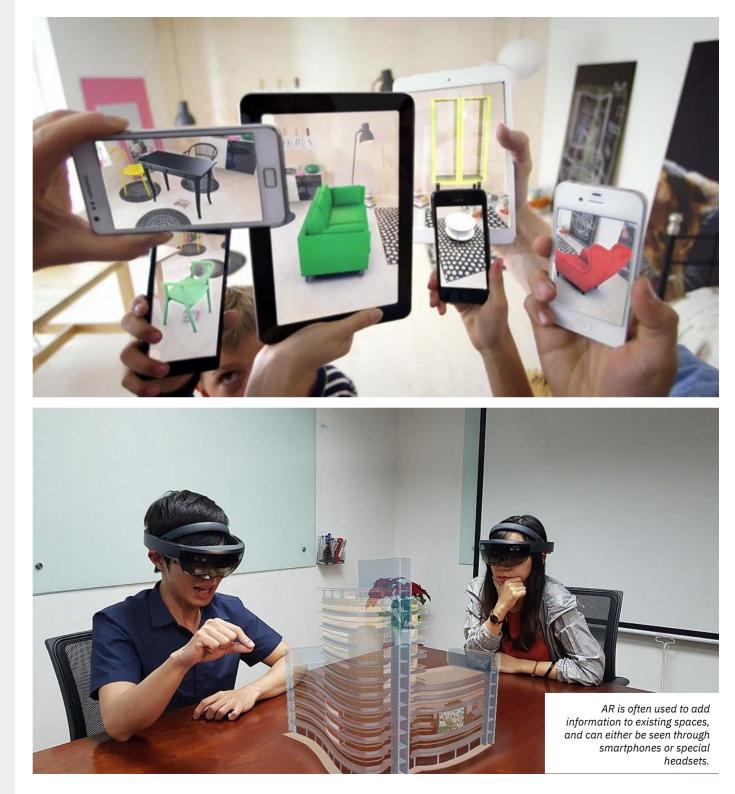
Virtual Reality is a medium that provides highly immersive experiences that can be leveraged to enhance storytelling. Such experiences can give the user the feeling of being in another environment. This can be especially useful when you want viewers to see someone's point of view or step into the subject's shoes, perhaps to even empathise with their situation.





### Is this the same as Augmented Reality?

They are similar mediums, and while both are classified as mixed reality or extended reality mediums, they have fundamental differences. Augmented Reality augments your view of the real world, by adding digital content to existing spaces, whereas Virtual Reality creates an entirely new world or environment for you to see and experience. Augmented Reality is usually seen through a camera-equipped smartphone or smart glasses, and Virtual Reality is experienced through a VR headset that encompasses your entire field of vision.



#### How can I experience Virtual Reality?

As a medium, Virtual Reality falls somewhere between a movie and an interactive game. The easiest way to view a VR experience is through your smartphone. You would need to have a gyroscope-equipped smartphone, which is the case with most phones today.

YouTube has many 360° videos that are VR ready. Once you open a video, you can move your phone around and look around the environment you are in. You can also insert your phone into a VR headset, such as a Google Cardboard, to further enhance the immersive nature of the experience. These videos can also be viewed on a desktop, albeit controlled by mouse and keyboard controls.

The video shown in the image on the top-right looks at the issue of how gender affects people in conflict. Watch in English and in Arabic.

Have a look at the bottom video we created as a part of our innovative learning project to train volunteers in the Philippines! <u>In English</u> and <u>in Tagalog</u>





### Are there different kinds of VR experiences?

There are 2 different types of VR experiences: interactive or non-interactive. As the names suggest, there are VR experiences you can interact with and influence the content you watch, and non-interactive VR experiences which you cannot control.

360° videos are non-interactive VR experiences and can be classified as Virtual Reality as it completely immerses the viewer in a virtual environment.

Interactive and non-interactive VR experiences can be viewed on a variety of devices, from a smartphone to mobile powered VR headsets, all the way to high-end dedicated VR headsets.



### How can I make VR experiences?

I'm glad you asked! Virtual Reality is still a fairly nascent medium, and typically takes some time to create. As a result, the tools for creating VR experiences are not as mature as the ones used to create films or take photos, for example. To get started on creating your VR project, there is a process you can follow to help you along the way. There is no one set process for this, and your idea or concept for a project may require certain steps which may be unique to your project.

Interactive and non-interactive experiences both have their own unique development process. To further simplify the process, we shall look at the two most common VR development processes: 360° videos and interactive VR experiences.

To shoot 360° videos, you will need a 360° camera, such as the GoPro Fusion, or Samsung Gear 360 for example. These cameras can be used to shoot 360° videos that can be edited into a 360° film.

Creating interactive VR experiences requires the use of game engine softwares such as Unity or Unreal Engine on a computer through which to create such experiences.





### What equipment would I need?

Creating and viewing immersive films require some unique equipment. 360° films and interactive VR films are new mediums, and are still in the nascent stages of their development. Often known as New Media, they require hardware not yet widely adopted.

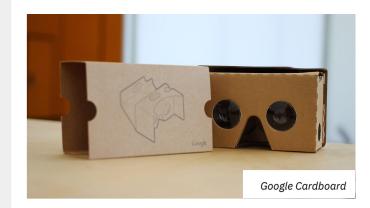
### The hardware you wish to create the experience for is also the one you should use for its development.

360° film is the simpler of the two, only requiring a gyroscope-equipped smartphone, and a VR headset to view. Although you can view 360° films using the phone, the VR headset adds a layer of immersion that makes the experience more immersive.

Not all VR headsets are made equal, and this makes it a little confusing to understand what to get. Some VR headsets only function when a smartphone is inserted into it. An example of this is the Google Cardboard headset. Other headsets of a similar nature are also made of high quality plastic. Google Cardboard headsets can also be used to view Interactive VR experiences, albeit with some compromises as smartphones are not very powerful and don't support many interactivity options.

A slightly more advanced type are typified by the Oculus Go headset. This is very similar looking to the Google Cardboard headsets, but the computing hardware is in-built, thus eliminating the need for a smartphone. Although it shares all characteristics with a smartphone-powered Google Cardboard headset, they usually have higher quality displays and sensors, making for a very comfortable and longer-lasting experience.

The best VR headsets available are those which require a powerful computer to function. These provide for the best experiences with high levels of interactivity. It is excessive to use this for 360° films, and would be better suited for interactive VR experiences which require higher levels of interactivity and high graphic fidelity.







## 360° Video



### Getting started with 360° video

360° videos, also known as immersive videos or spherical videos, are video recordings where a view in every direction is recorded at the same time, shot using an omnidirectional camera or a collection of cameras. The footage recorded is then stitched together to create a video that can be viewed in every direction.

These videos are easy to share and view, either via popular video sharing services such as YouTube and Vimeo, or on smartphones and computers. Although such videos are the easiest way to create VR experiences, they require a specialised 360° camera.

Before you get started with creating 360° videos, it's important to first write down a concept for your film, and identify what you want to talk about.

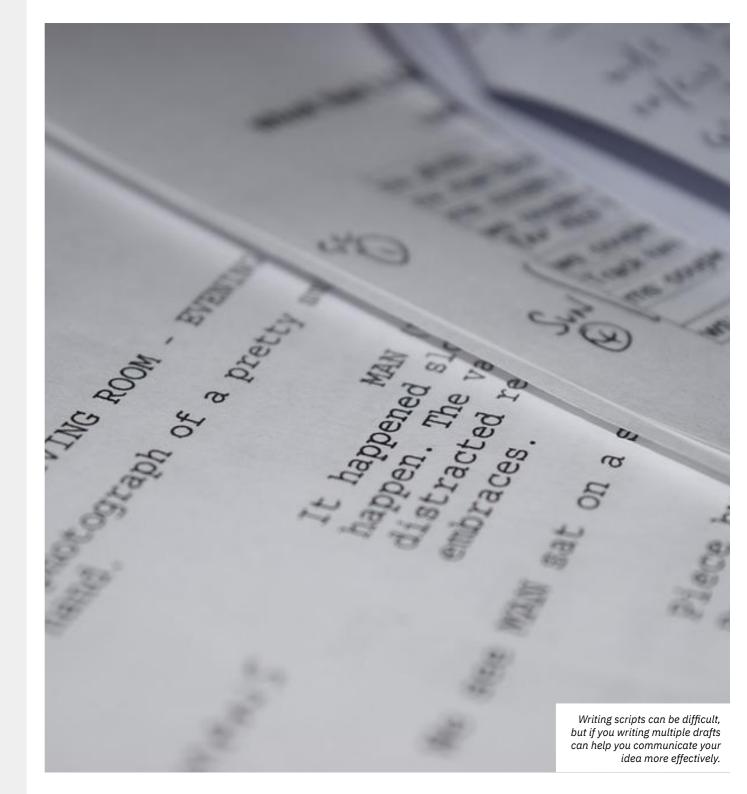




#### Writing a script

Just like making a movie, or creating a game, it is important to write a script to help you plan out the development process. A script outlines a story or the film's narrative, that may be used to communicate a certain message.

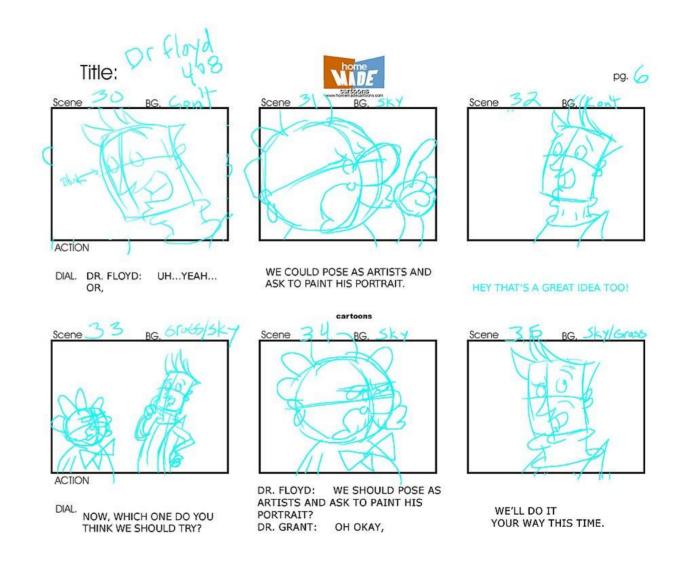
This is the first and most important step in creating a 360° film. Without a script, it is very difficult to continue working. A script is a written manifestation of your concept and dictates the tone, language, visual aesthetic, and sound, amongst other aspects of your 360° film.



### Creating a storyboard

A storyboard is the visual framing of the script. It helps you understand the elements needed for each shot, and is usually represented by a frame-by-frame representation of your film, listing down the assets needed for every shot.

To create a storyboard, draw out a grid of rectangles on a piece of paper. In each rectangle, draw out a rough visual of every shot, framing exactly what the camera would see. Below each box, write down what is happening in the shot, with an excerpt from the narrative, characters involved, the location of the shot, and the sound. Fill in all the boxes, and use as many sheets as you need to create the storyboard. The more detailed your storyboard is, the more easily you will be able to develop your film, as the extra details will help you create a production plan, which dictates the creation of your film.



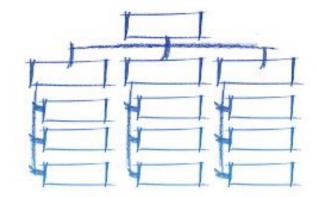
Making a storyboard is a fun activity! Don't worry about the quality of your drawings, just make sure you include all the relevant details

## Making a production plan

The creation of a production plan is a critical process which helps you plan out how you are going to make your 360° film. The creation of a 360° film is not dissimilar to creating a regular film: depending on your script, your film could involve finding the right people to cast, scouting locations to shoot at, getting the right permissions, and recording sound and music. Coordinating all these activities to ensure that you efficiently procure all the assets you need is not easy, and requires a detailed production plan.

The storyboard created in the previous step will help you create a consolidated list of requirements for your film. Once you have a list of the things you need to create your film, create a matrix with a timeline which will help you see what is available when, and at what cost. For example, you may want to shoot in a particular location, with a particular actor, but if the availability of the actor does not coincide with the timings of the permissions of shooting at the location, then you will have to reschedule your shoot or find another place to shoot at. A detailed production plan will help you plan the production of your film, ensuring that once you start shooting, everything proceeds as planned and reduces the scope of any nasty surprises.

A **Kanban** template or a **SCRUM** template can help create an efficient production plan.



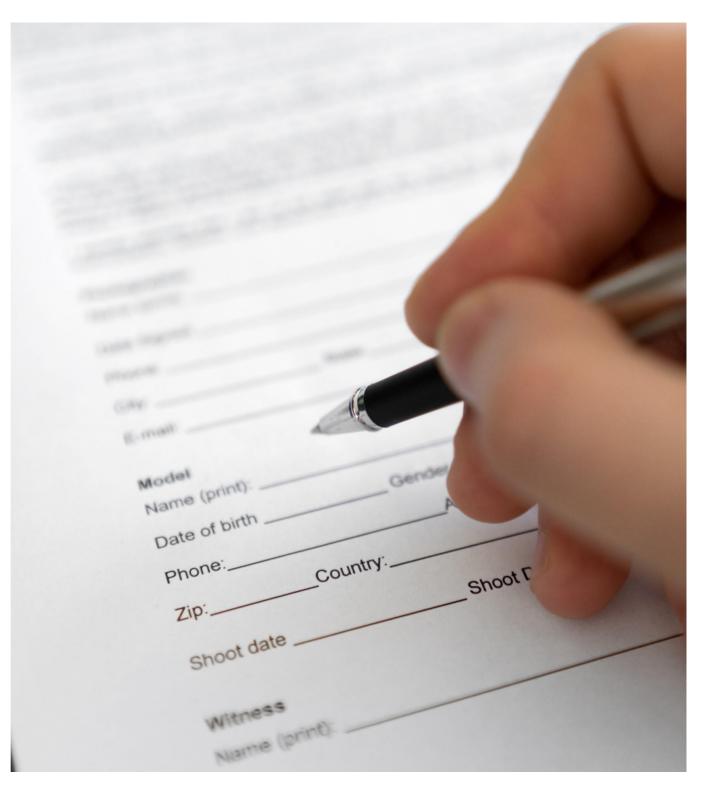








Before you start shooting, it's important to ensure that you are not breaking any laws, or recording someone without their explicit consent. This is a critical consideration and could lead to legal implications. Always make sure you get written permission to shoot from the proprietor of the location and check the local laws before shooting in public spaces. If you do shoot people, make sure that they sign release forms explicitly stating that they consent to be shot on video for your project.



#### Shooting 360° video

Using 360° cameras to shoot video is very different from using a regular video camera. Since the camera will be capturing everything in the scene, you will have to **plan your shots** very carefully and ensure that only what you want to be captured is seen by the camera.

It is important that the **narrative of your film is comprehensive** and clear, and keeps the viewer focused on what you would want them to look at. 360° video affords a lot of freedom for the viewer, but a disinterested viewer could completely miss out on your intended communication if you do not keep them engaged with well-framed shots, or take care to remove any distracting elements from the scene.

There is also a **safety aspect** to shooting 360° footage. Since the video may be watched via a VR headset, you will have to ensure that the video is VR safe. VR is a highly immersive medium, and the combination of the audio-visual content could have an adverse effect if not handled right. For example, the sensation of motion and balance can be triggered as a result, and if not sensitively handled, can make for highly unpleasant viewing experiences.

For many viewers new to VR, wearing the headset and viewing content can trigger motion sickness, vertigo, or even cause claustrophobia. Hence, it is advisable to be very **careful while shooting a 360° video**. Sudden motion, quick cuts, drops in framerate, and fast rotation are very uncomfortable for the viewer, and can also lead to headaches, eye stress, and dizziness.

It might help to shoot at **60 frames per second** while shooting since the footage shot at this frame-rate makes for smoother viewing and helps make for far more comfortable and reduces motion blur and strain on the viewers eyes. Do ensure that you export your 360° film at the same frame rate as well!

Be sure to keep in mind how you are **mounting your camera**. If you use a tripod or head mount for example, these will be visible if the viewer looks down. There are some simple methods for masking stationary objects like a tripod out of the frame later, which can be done in Adobe Photoshop.





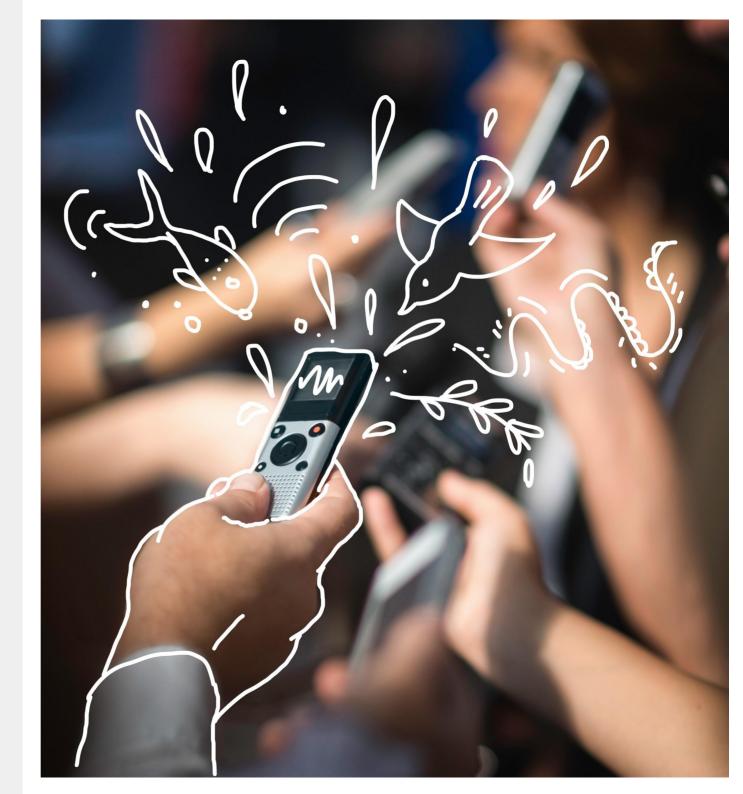


#### **Recording sound**

Without the sound, a 360° film loses out on half its immersive qualities. In fact, it could be argued that sound is perhaps more important than the visuals. Adding contextually relevant sounds, or a nice background track will not only further immerse the viewer in the virtual world, but also enhance the storytelling aspect of your film.

Be aware of the sounds you use in your film. If you are using sounds that have not recorded or created by you, then check on the license of the sound. If the sound has a creative commons license, feel free to use the sound while crediting the original creators. If, however, the sound has a commercial license, ensure that you pay the appropriate usage fees or royalties for the content you use. Not doing so can make you liable to legal action.

Just as with the visuals, you should ensure that the sounds in the VR film are VR safe, and do not cause any discomfort to the viewer.

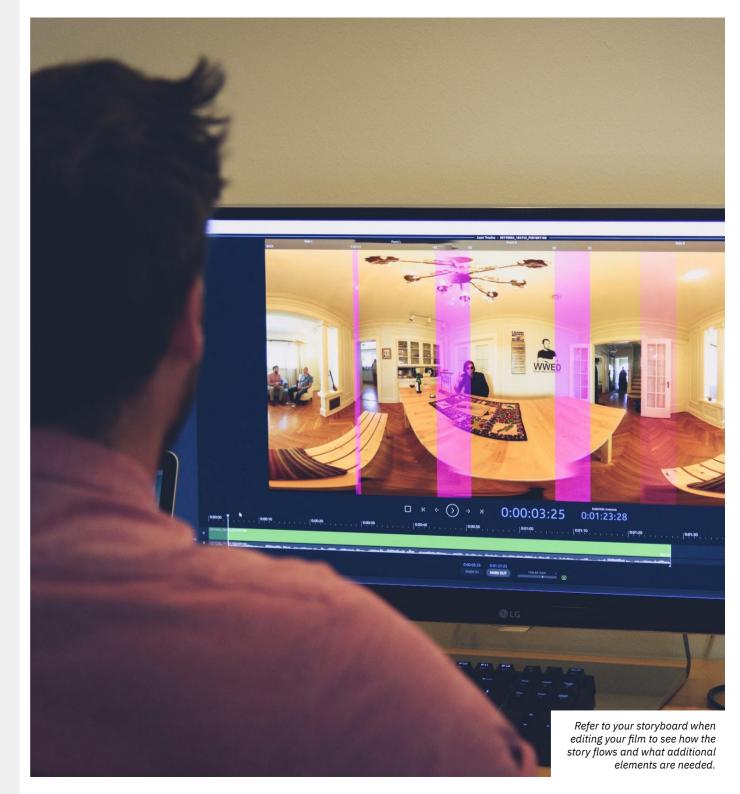


#### **Editing your film**

Depending on what type of camera you use, you will have to use various software and tools to stitch your video files together for 360° playback. Each camera's media has a different workflow, and you can find tutorials online to walk you through all the necessary steps in the post production editing process.

Adobe Premiere Pro and Final Cut Pro are great tools for editing 360° video. They will read your formatted 360° video files and allow you to make further changes to the colour grading and framing. These commercial tools are not cheap to buy or license, and highlights the high costs of production of this medium. These are the most popular tools used by creators around the world with learning material freely available online.

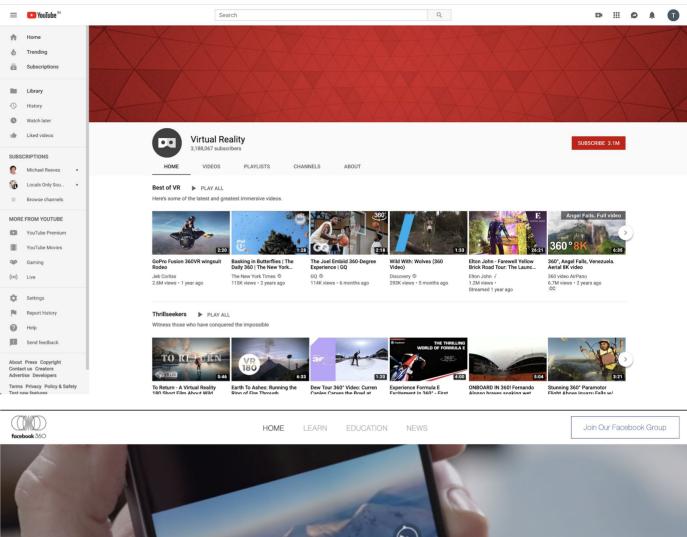
**DaVinci Resolve 16** is a great professional grade free-to-use tool to edit and colour-grade your 360° footage. Although has a paid version, the free version is more than adequate for most prosumer purposes.



### **Releasing your film**

Now that you have shot your film, added sound, and edited it, it's time to share it with the world! Before exporting your film from a video editing software, make sure that it is VR safe, and that all content has been attributed or credited to their respective owners. In the export settings, ensure that the film editing software encodes the 360° metadata into the video file so that it is ready to be seen by your target audience.

You can upload the video to YouTube, which will present your film in 360° on all platforms (mobile, web, VR headset) to make it easily shareable. Again, make sure that you have seen the final edit once before sharing it with others to check that is safe to watch and no editing errors remain.



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video on.



Written by Grant Davis, who helped create the film:

**You Cannot Argue With a Flood** was shot over the course of a week in the Philippines, documenting the story of Hanan, a survivor of the Marawi crisis. The film is an interesting example of 360° film because it transported the viewer to locations otherwise inaccessible to the publi due to tight military security.

The production planning was done a few weeks in advance with the help of the Humanitarian Leadership Academy's team in the Philippines. This was essential for identifying the film's main character and getting permissions to certain locations.

The film itself employed a more organic, observatory approach, which began with a camera interview with the film's subject, Hanan. The interview was directed by <u>Lauren</u> <u>Anders Brown</u>. Through this interview, key narrative moments and locations important to the character and her story were identified. The scripting process then began in parallel with the shooting, and like much non-fiction work, required a lot of improvisation and flexibility. Thanks to the team who had began the process of acquiring permissions ahead of the shoot, the crew was able to access otherwise sealed locations where the Marawi siege had occurred. Despite the prior ground work, there were unexpected safety issues which nearly led to the crew losing access to key shoot locations. In the end, access was granted, and the crew was able to shoot in locations around Marawi city. This added a significant emotional impact to the film and the process itself, as the main character Hanan had herself not been allowed to return to these locations, specifically her old home. Simply setting up the camera and letting the real emotions unfold gave the film an unexpected drama and depth.

The process of shooting itself was quite simple. The camera was mounted on a tripod and the characters were left to explore their spaces. Simple tools like an multi-directional microphone were used to capture the depth of the spaces. These recordings were later synced with the camera audio in the editing process.

Watch In English and in Tagalog.







The Team

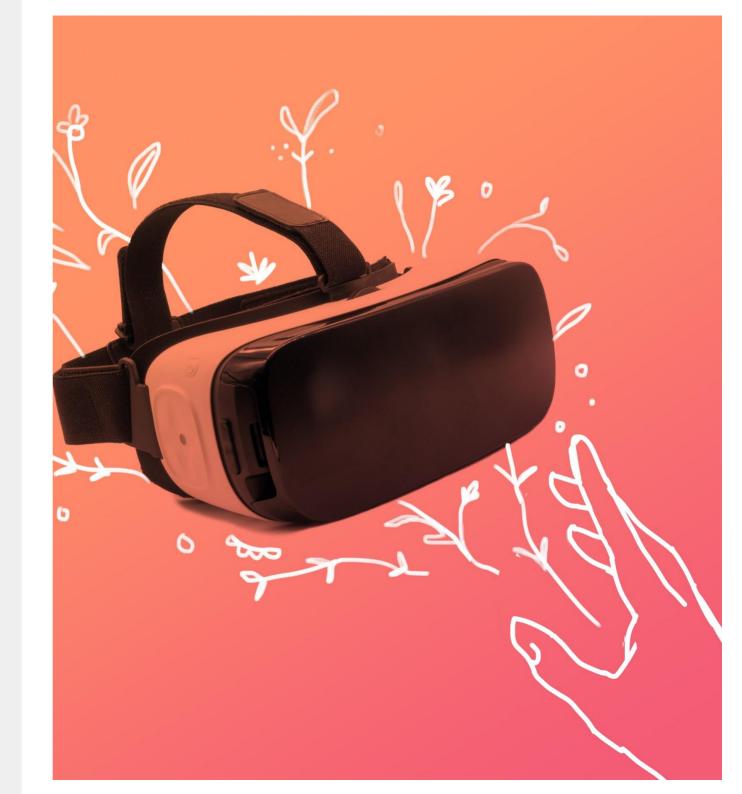


## Interactive VR



#### Getting started with Interactive VR

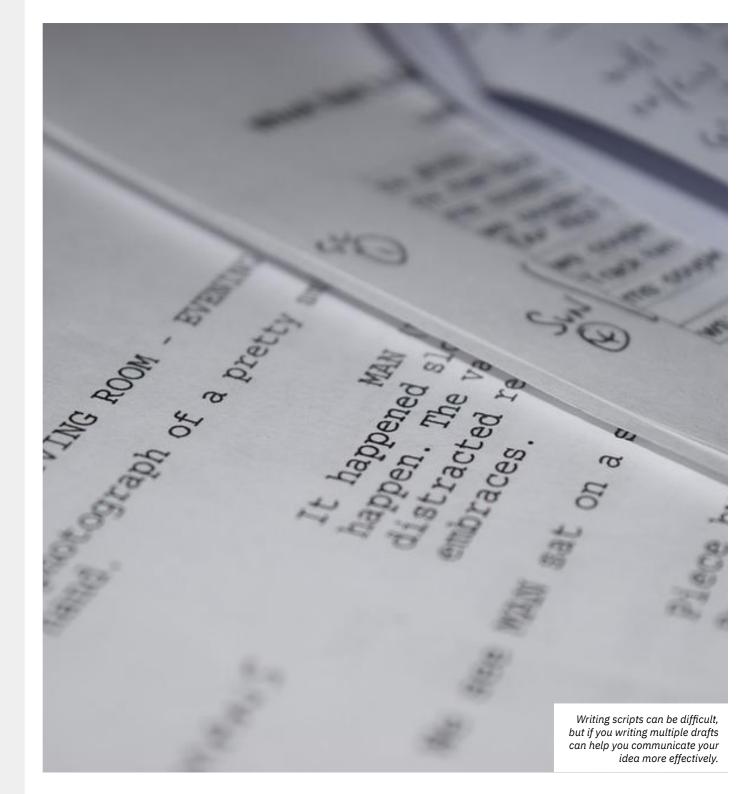
Interactive VR experiences allow users to interact with and manipulate their virtual experience. This can either be through changes in the environment or narrative. Not only does this increase the level of immersion in comparison to 360° videos, it also helps create more complex narratives and allows each user to have a unique experience.



#### Writing a script

The scripts you write for interactive VR experiences will be slightly more complex, as they must also account for divergences in storylines, or multiple stories within a larger narrative, depending on the complexity of your experience.

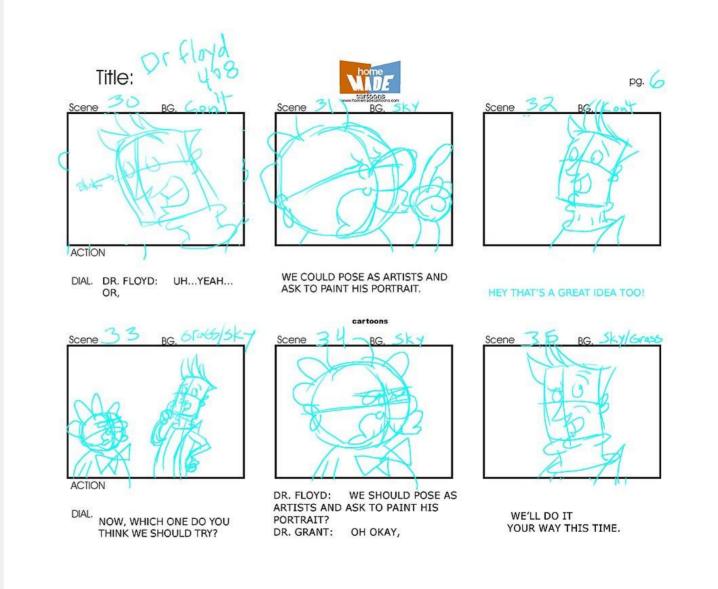
The script is the backbone of your experience, and will dictate every element of what your viewers will see and hear.



## Creating a storyboard

Once you've written your script, it's time to get started on creating a storyboard. This where you will start translating a written description into a visual one. This process will help you define the look and feel of the experience, and detail out the content needed for every scene.

Since you will be working in a 360° space, it is important to ensure that you detail out all the visible angles and ensure that you don't miss out on anything! Since your viewer can look in any direction they please to, great care and attention has to be spent on ensuring that every part of the environment you create has to be well-detailed.



Making a storyboard is a fun activity! Don't worry about the quality of your drawings, just make sure you include all the relevant details

#### Creating Interactive VR experiences

Although both interactive VR experiences and 360° videos are Virtual Reality experiences, they have very different development pipelines. Interactive experiences are usually built with specialised software known as game engines, or on existing frameworks.

There a few existing frameworks which are usually in the form of simplified software. These applications have a simple and easy to use visual interface which makes it easy to create interactive VR experiences. For example, <u>OmniVirt</u> and <u>WondaVR</u> allow for simple interactivity using 360° videos and images. Although these applications allow for easy creation of interactive experiences, they are limited in their functionality.

For example, WondaVR only allows for gaze-based, or button-based interactivity, which can be inadequate to create the film you would want to make.

Game engines such as Unity, or Unreal **Engine** are tools which are designed to handle all sorts of media. such as sound. pictures, 3D models, special effects, and the capability to include elements of interactivity as well. These softwares allows for the ability to create absolutely anything you can imagine, and the capabilities are almost limitless! Although not as easy to use as ready frameworks such as WondaVR or OmniVirt, it is still possible to create great interactive experiences without having to write any programming code. The abundance of patches and assets available on the online stores of their respective platforms mean that it is possible to create interactive VR experiences very quickly and easily. For this section, we shall concentrate on creation with game engines, since the workflow of creating interactive VR films with simple frameworks such as WondaVR and OmniVirt are very similar to creating 360° films.





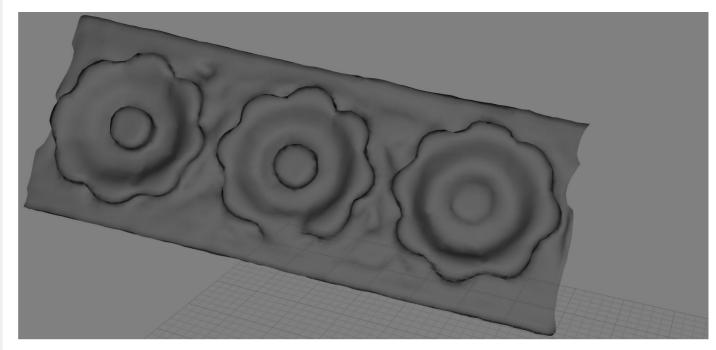


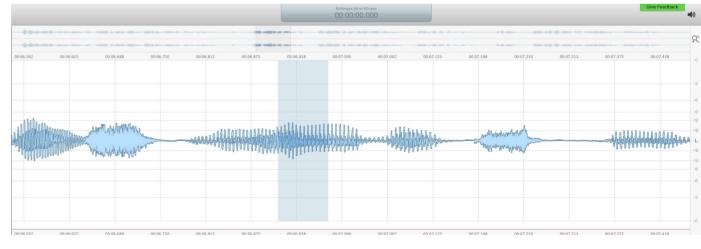
#### **Collecting assets**

To create any sort of interactive experience using game engines, you need assets to work with. Assets are digital files which are the building blocks of a VR experience. This could be images, sounds, or 3D models, amongst other data files. So before you can get started on creating your experiences, it's important to first make a database of assets. This is the first step of your production process. Based on your script and storyboard, you can start collecting or creating assets that your experience requires.

Once you have collected your assets, it's usually a good practice to sort them scene-wise in order to be able to cross-check if you have indeed collected all the assets you need. The assets you collect or create directly inform the tone of the environments you will make, thanks to which their quality and curation are very important.

As always, make sure the assets you download from other sources are either under a creative commons license or obtained with the necessary licenses.



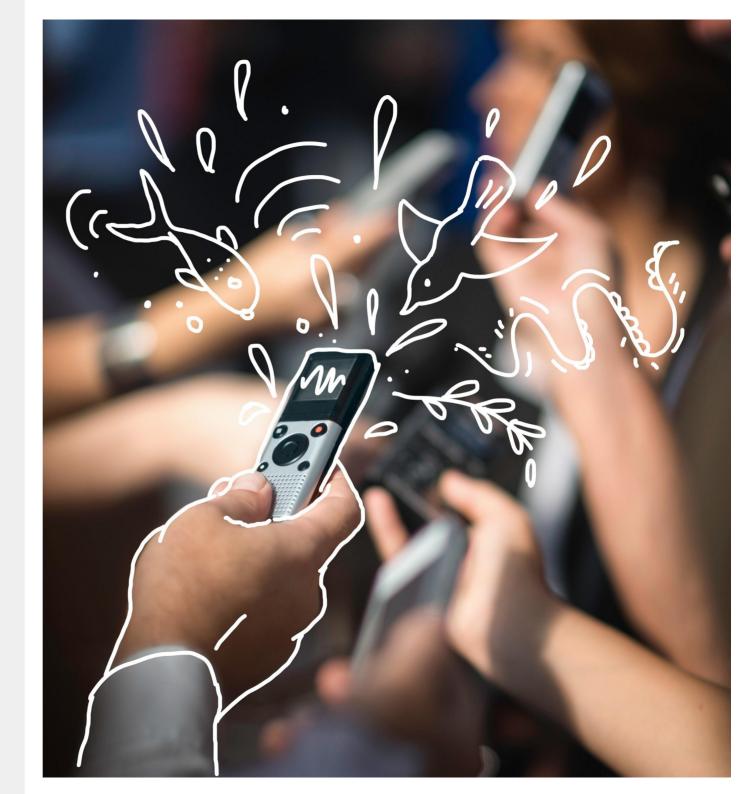


#### **Recording sound**

Sound is an integral part of any VR experience, and perhaps even more so in interactive VR experiences. Sound is an important tool to help communicate to the viewer the changes in their environment as a result of their actions. It's a useful feedback mechanism which helps users understand the environment they are immersed in. For example, playing a sound when a viewer looks at, or approaches an interactable part of the experience helps them understand that there is something to play with, or something to see.

Sounds also play a major role in helping set the mood of the experience. For example, playing a calm and relaxed background score will help the viewer feel calmer and a lot more comfortable, whereas a fast-paced and active soundtrack puts the viewer on edge, priming them to expect something to happen.

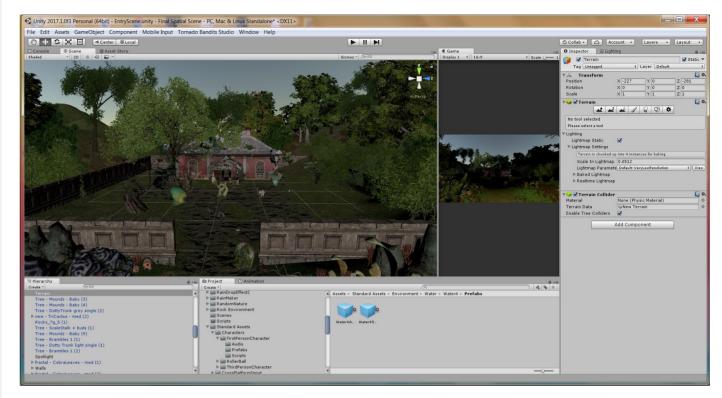
Even if you don't have very good visuals, having great sound can help make your experience much more gripping than it may seem.



## Putting it all together

Once you have all the assets in place, it's time to start putting it all together. Game engines such as Unity and Unreal Engine have an easy-to-use interface, and environments can be built by simply dragging and dropping them into the 'Scene' window. Once you drop them into the scene, use the inbuilt movement, scaling and rotation tools to customise the scene exactly how you want it.

Play around with sound and lights to get the mood and tone of the environment just as you want it. Setting up the scene is akin to using Lego bricks to create your environment. By placing elements just so, and playtesting multiple times, you will be able to create immersive scenes with meaning.





## Building interactivity

Before including elements of interactivity in your VR experience, it's important to first recognise how interactivity can help communicate the narrative and help tell your story. This will define the nature of interactivity as well as when to include those elements.

The nature of interactivity can also vary depending on the target platform you wish to publish to. Higher fidelity desktop experiences can include hand controllers and motion tracking, whereas lower fidelity mobile experiences allow for gaze interactivity and basic remote controls. Gaze interactivity allows users to select content within their 360° environment by simply looking at it.

Once you select a target platform to publish your experience, you can narrow down on the nature of interactivity and start integrating it into your experience.



### Releasing your VR experience

Since interactive VR experiences are not exported in the form of videos or any other common media formats, it is a little more complex to disseminate your work. Interactive VR experiences are exported in the form of executable files, for the platform of your choosing. Unity can export the same project to multiple platforms, such as Windows, Mac, Android, iOS, or Oculus. The executables for each of these platforms are different, hence the same file cannot be used across platforms.

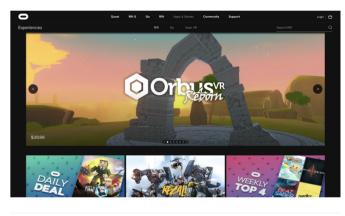
Before you hit the export button, it is important that you decide which platform your experience will be viewed on. Desktop platforms such as Windows or Mac can allow you to create higher definition experiences with higher levels of interactivity and immersion, but will hamper your reach and limit accessibility.

Mobile platforms such as Android or iOS will allow you to reach out to a much larger audience, but will restrict the fidelity and level of interactivity of your experience. Standalone devices such as the Oculus Go fall somewhere in between desktop and mobile platforms. These devices have the same fidelity as mobile, but are more comfortable to wear for longer periods of time.

Before you release your VR experience to a larger audience, it's important to first playtest it, and ensure that not only is it comfortable and safe to view, but that everything works as planned. Once testing is complete, it's time to release it to the world at large. Interactive VR experiences are distributed through various online stores such as the <u>Play Store</u>, <u>App Store</u>, or the <u>Oculus Store</u>, depending on the target platform. Once you launch on the store, your viewers can easily find and download your VR experience on their devices.

#### Virtual Reality on Steam





Get in the game I a magic wand or By through space with an intuitive controller that put



### Case Study: Camp 2029

Written by Jeremy Kirshbaum, who created the experience with his partner Alexander Goldman at SixerVR:

**Camp 2029** brings to life a fictional scenario from research about the future of humanitarian skills. The interactive story takes the viewer through three scenes of a future in which well-intentioned efforts to improve the life of refugees with technology has gone awry, creating a future that is negative for humanitarian workers and beneficiaries alike.

The first step of creating the experience was crafting the storyline, which drove our initial decisions about producing the experience. The story is rooted in themes from the present, but portrays a fictional future scenario, so we decided to use fictional assets (3D models) to tell our story, as opposed to photos and videos. This also helped us keep the locations of our scenes deliberately vague.

We chose the Oculus Go platform to balance interactivity and accessibility. Using more powerful headsets would give us more interactive tools, but few people could experience the final product. We chose gaze interaction so that the experience could be converted to a phone experience as well. Immersive experiences are more powerful when the interaction mechanic is part of the story. We decided to weave the gaze interaction into the story by making it an "iris scanner", which is a commonly-cited example of how technology can improve identity management in refugee camps.

When we tell stories about the future, we measure our success in whether it changes people's behaviour. The risk in using immersive technologies is that the medium will actually distract people from the content we want to convey. For this reason, we focused carefully on keeping the interactions simple and intuitive for people, even if something more complex might have been our first choice.

Technology is not the biggest barrier for VR storytelling, it is the lack of techniques to make the emotions and ideas deep enough that they are worth the potential distraction from the new medium.

We had incredible support from HLA and their teams in the Philippines and Jordan, as well as from their partner, Quicksand, in collecting the research that provided background to the story. If Camp 2029 is successful, it is because of this: the content and ideas are saying something important, in a way that is best done in VR.









#### **Get in Touch!**

Do get in touch with us, and let us know what you thought of this toolkit! We'd love to hear from you.



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