

Development of a VR Training Video Database

Executive Summary

This final report contains a detailed overview of the IAMU Organizational Development Project: *Development of a VR Training Video Database* which was awarded in 2020 but was conducted during 2021-2022 due to the COVID-19 pandemic. This executive summary provides a summation of the items discussed in the final report including the outcomes for the project.

Background: Virtual Reality (VR) and 360-degree videos have made recent advancements which have created an opportunity for new experiential learning methodologies. Although research indicates that these technologies can be a beneficial addition to learning, they continue to struggle to become an integral aspect of learning structures due to lack of resources to incorporate them across curriculums. For this development project, we proposed to create an online database, called the IAMU VR Database, which would allow IAMU member universities to build a communal collection of Marine VR Training Videos, here defined as 360-degree videos designed for training purposes that are viewed in VR, which could be used for marine education and training.

Since the project was delayed due to the COVID-19 pandemic, technology continued to develop, and new advancements became available such as the ability to add interactive material to the VR Training Videos. This caused a need to create an online database that was more flexible and would allow the content sharing of any kind of immersive learning material. This led to the use of a Wiki or a forum-based structure which would allow IAMU member universities to post their immersive learning materials along with research on how to integrate immersive learning materials into a learning environment. To build a foundation for the IAMU VR Database, several interactive VR Training Videos were created. These interactive VR Training Videos were termed Virtual Training Experiences (VTEs) because of their increased level of interaction along with their ability to be accessed through a variety of platforms including smartphones, tablets, laptops, and VR headsets.

Project Phases: The development of the IAMU VR Database required several different phases to complete the end goals of the project. Although these phases outline the timeline of events, there was a considerable amount of overlap between the different phases as each phase informed the others. The phases included filming the VTEs, editing the VTEs, creating the IAMU VR Database, conducting user experience testing on both the VTEs and the IAMU VR Database, and reporting/presenting on the database. Although the actual creation of the VTEs and the IAMU VR Database is the foundation of the project, the last two phases were just as essential to the success of the project. The user experience testing was critical, as it ensured that the IAMU VR Database along with the VTEs, were easy and pleasant to use. This ensured that they would be easily accessible and beneficial to IAMU member universities. The reporting/presenting of the database was also essential to the project as the IAMU VR Database is founded on the participatory nature of the IAMU combined with an online communal database.

Project Outcomes: The project outcomes included the creation of the IAMU VR Database which would be a central location for IAMU member universities to contribute immersive learning materials, the creation of several VTEs which would act as the foundation for the IAMU VR Database, and reporting on the project at several different stages throughout the project. The IAMU VR Database was created by setting up a forum-based website which had several main forum threads to provide space for member universities to contribute materials. Initial materials were posted within these forum threads to begin the collaborative process of content sharing through this platform. Some of these initial materials included 360-degree videos which were previously created and posted on YouTube by a variety of content creators. The VTEs which were created for this project were also posted within these initial forum threads. The VTEs which were created included one on helicopter personnel evacuation operations, line handling operations on the stern of a vessel, and cargo operations which used a married fall system.

User Experience: The user experience testing was an essential aspect of the project as it was critical to check if the materials could be easily accessed and if they were of a high quality. If the materials are difficult to access, or if the quality of the materials is poor, professors or students could become frustrated and turned away from immersive learning materials in general. This user experience testing was conducted by sending the materials for review to the Svendborg International Maritime Academy (SIMAC) who was a project partner. Additionally, the materials were sent to professors and students at SUNY Maritime College. When the materials were sent to SIMAC, the initial version of the VTEs proved to be exceedingly difficult to share over the internet. The files were very large, requiring complicated processes and long downloading times to accomplish. It was determined that this process was impractical for the purposes of this project as it would discourage the collaborative nature intended for the IAMU VR Database. Based on this feedback along with other suggestions, the VTEs were adjusted, and a new methodology was identified. This new methodology allowed the VTEs to be played easily through a web browser and only required clicking a single link to access them.

Suggestions for Immersive Learning Materials: As the purpose of the project was to create a space for collaboration, it was vital to the ongoing success of this project to make available an in-depth description of all the steps taken for immersive content creation and distribution through the IAMU VR Database. All processes, programs, equipment, settings, and techniques are outlined in detail in the Final Report so that all IAMU member universities have the knowledge required to create and share their own VTEs.

Future Actions: Now that this development project has been completed, the IAMU VR Database is fully online with several examples of immersive learning materials available for use. However, this is only the beginning of this project. The intention of this project was to create the framework and foundation for a collaborative space for IAMU member universities to share immersive learning materials and discuss pedagogical approaches/viewpoints on opportunities which these technologies present. For this to be successful, IAMU member universities must use and contribute to this platform. To accomplish this, continued outreach is necessary. Finally, this platform also provides countless new opportunities for research such as investigating the effectiveness of a collaborative database for immersive materials or exploring pedagogical approaches which integrate VTEs into the learning process.