

Virtual reality to train inmates

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Virtual reality to train inmates, is an initiative from [Greta du Velay](#) (FR), CIRE, Centre d'Initiatives per a la Reinserció (ES), Innovative Prison Systems (PT) and SQLearn (GR) supported by the Erasmus+ program of the European Commission (2020-2022).

Shooting 360° videos with craftsmen

Appointments have been made with construction workers wishing to take part in the project. They are members of CAPEB 43, the employers' association for the building trades, which more specifically defends the interests of VSEs and SMEs in the construction sector, and with whom Greta du Velay has a long-standing partnership for the training of their members' employees.

The first sequences are designed to illustrate the trades of bricklayer, plasterer and painter through a number of representative activities. They take place on building sites around Le Puy-en-Velay, both indoors and outdoors. It should be noted that the season is relatively favourable, with sufficient natural light most of the time, including in individual houses under construction.

Tests were carried out to determine the best way to film at 360°, a technique that does not allow for off-camera shots. It is not possible to use a boom for sound, and any additional lighting is visible. Only the booms associated with the cameras can be automatically removed when the shot is taken. As the person operating the camera is also visible, you need to place it on a stand and control it remotely using an Android application.

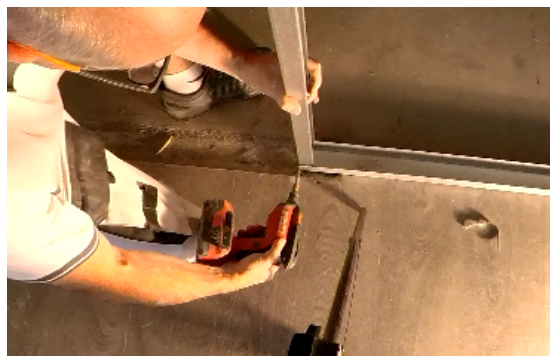
To avoid the sensation of vertigo, camera movements must be avoided, so to film different parts of the same site, we take several 20- to 30-second still shots. To complement the video, we took photos of the different tools and materials as well as of the scene seen from another angle, but as their use in the capsule was not confirmed, we abandoned this practice.



Installation of metal reinforcement bars



Fixing rails for a wall



Material used

Cameras that film 360° and produce a quality image are available at reasonable prices (from 500 euros). The main selection criteria are: resolution, number of images per second, colour rendition, ability to film in low light and price. It's worth noting that with entry-level cameras (<1,000 euros) it's preferable to film in sufficient natural light.

We are using an Insta 360, which offers a definition of 5,760 pixels by 2,888 at 30 frames per second, but with good colour rendition. As spherical video is much larger than traditional video, the number of pixels is also spread over a much larger viewing area. Our field of vision at any given moment being around 120°, a horizontal definition of 5,700 pixels over 360° corresponds to 1/3, meaning 1,900 pixels.

The Insta 360 has two lenses filming at 180°, which requires processing with the associated software once the video has been recorded to assemble the two video streams to create the final 360° image. Note that sometimes if the subject is too close, the join between the images is not always perfect.

As they result from the assembly of several images, the video files are very large (5 minutes uses around 5 GB) and their circulation between the partners therefore requires the use of a download platform (in our case OneDrive).



The camera is placed on a stand about 1.5 m from the action, and if possible at the same height as the working hands.

Storyboard

A preparatory script is drawn up to plan each video, bearing in mind that each trade will be illustrated by two to four sequences. A discussion with the craftsman is used to plan situations based on his current worksites, access to them, the availability of each person and the weather forecast, situations from which specific objectives will be derived. The script or storyboard specifies

- The context of the project (location, interior/exterior, etc.)
- A shooting date
- The activities involved
- The estimated duration of the sequences to represent the activities
- The tools and materials to be used
- The learning objectives
- Any additional information

Visit our web site: <https://virtual.reality.for.inmates.training/>

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