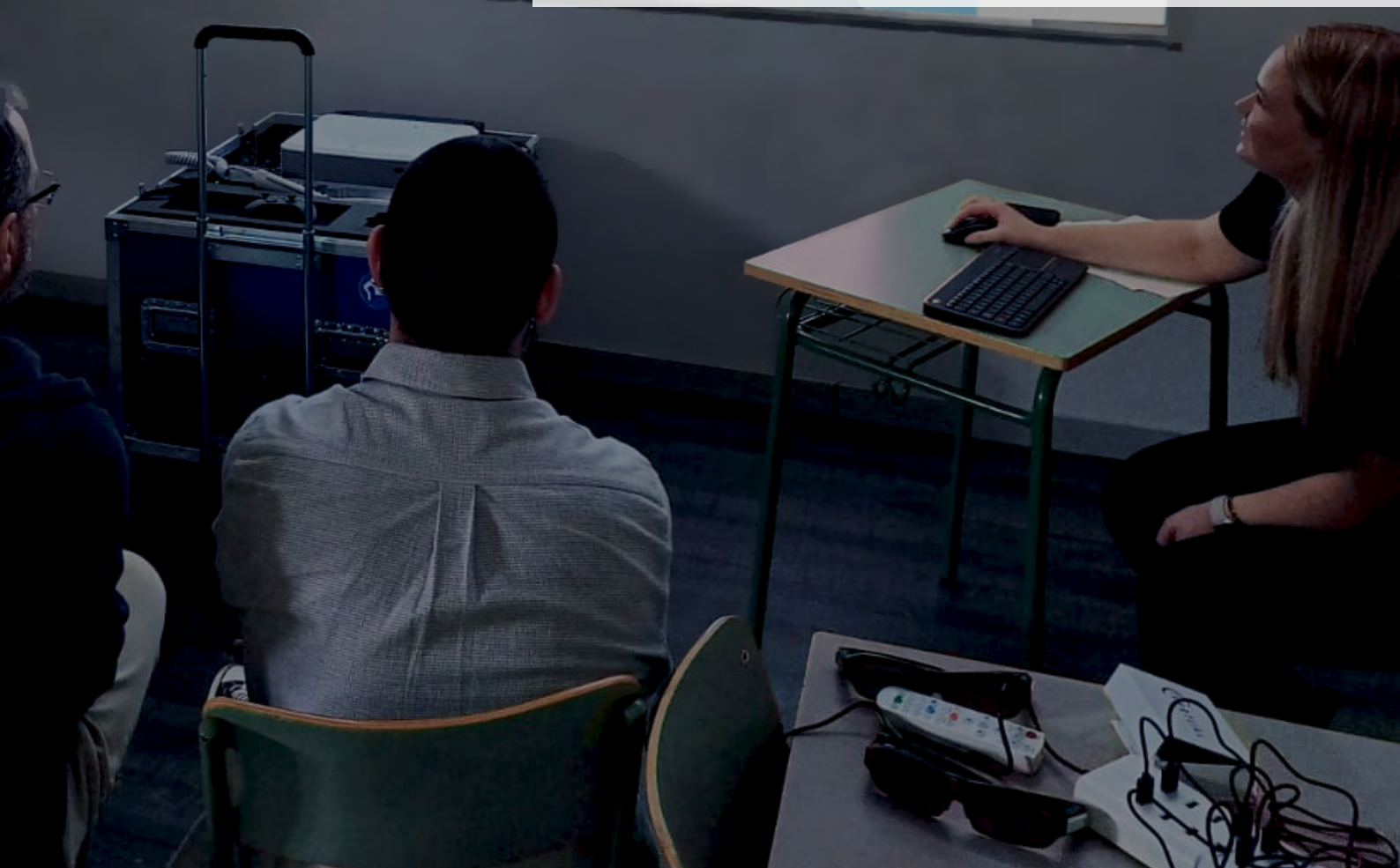




CASE STUDY

VERT SIMULATOR AT CALASANZ LANBIDE IKASTEGIA

The integrated vocational training centre Calasanz Lanbide Ikastegia, located in Santurtzi (Vizcaya), becomes the first centre in the Spanish State to install the VERT virtual reality simulator of Vertual in its Compact version, thanks to the funding of the Vice-Office of Vocational Education and Training of the Department of Education of the Basque Government in its call for the year 2021.





Calasanz Lanbide Ikastegia is a recognized and consolidated educational institution with around 1000 students in Compulsory Education and Vocational Training (VET). It is a reference centre that also develops innovative methodologies. In this context, it is now the first centre in the Spanish State to install Vertual's VERT virtual reality simulator for the training of students of the Certificate of Higher Education (HNC) in Radiotherapy and Dosimetry. Also, the HNC in Diagnostic Imaging and Nuclear Medicine will be able to benefit from the implementation of VERT.

Calasanz Lanbide Ikastegia becomes the first center in Spanish State to install the VERT virtual reality simulator for teaching professionals in radiotherapy and dosimetry, thanks to funding from the Department of Education of the Basque Government.



Calasanz Lanbide Ikastegia has obtained funding from the call for grants for the acquisition or renting of machinery and/or equipment of the Vice-Office of Vocational Education and Training of the Department of Education of the Basque Government in 2021.

The project is a collaboration with a company, in which Aplicaciones Tecnológicas de la Física has participated in the process of drafting and justification of the project.

VERT: IMPORTANCE OF TRAINING FUTURE RADIOTHERAPY PROFESSIONALS

Adequate training and education of radiotherapy technicians is essential for many critical tasks in the commissioning of treatment and each of its steps. Radiotherapy technicians are responsible for patient care, positioning, handling of peripherals associated with therapy, treatment calculation, etc.

In addition, the number and complexity of radiotherapy techniques and accelerator and peripheral technology have increased in recent years. The QA and treatment verification systems is often responsibility of radiotherapy technicians, together with the image acquisition systems (X-ray, MRI, etc.) used to guide treatment.

For all these reasons, the training of radiotherapy technicians is of a theoretical-practical nature. On the one hand, they need to understand abstract concepts such as the interaction of radiation with matter, the acquisition and reconstruction of medical images (X-rays, MRI, CT, PET, etc.), and concepts of physical dosimetry. On the other hand, a set of clinical concepts such as patient immobilization, tumour contour definition, anatomy, etc. are required.



VERT virtual reality simulator from Vertual Ltd. complements current training for radiation therapy professionals, enhancing their preparation for the complex and changing needs of the industry.

The most convenient place to learn these practical skills is the clinical setting. However, at present radiotherapy departments are overloaded by the very high number of patients treated in the accelerator. On the other hand, errors that endanger the patient or the expensive equipment are not allowed in the clinic. All these consequently limit the number of student practices, but also the development of these practices, which take place as a mere observation of the professionals during a reduced period of time.

By incorporating virtual simulation, the company Vertual Ltd. aims to complement the current conventional training to improve the preparation of radiotherapy professionals, including technicians, according to the complex and evolving needs of the sector.

VERT, VIRTUAL REALITY SIMULATOR FOR RADIOTHERAPY EDUCATION

VERT is the first and only virtual reality simulator for teaching radiotherapy. This educational tool consists of dedicated hardware and software, with the ability to simulate with high realism the bunker of an accelerator, using anonymized clinical data. In this way, it generates a safe and interactive space for the learning of future professionals.

Several published studies¹⁻⁵ validate the use of VERT in radiotherapy education. VERT is considered a valuable resource in a wide variety of subjects and activities (teaching physical concepts⁶, IGRT⁷, protons^{8,9}, etc.).

The VERT system is already installed in more than 30 countries around the world in leading institutions such as the National Health Service in the United Kingdom, the prestigious MD Anderson Hospital, and the Mayo Clinic, now joined by the



Calasanz Lanbide Ikastegia in Santurtzi, the first centre in the Spanish State to incorporate it into the training of radiotherapy technicians.

VERT has demonstrated in several scientific publications the improvement of radiotherapy education in first level institutions around the world, to which now joins the Calasanz Lanbide Ikastegia of Santurtzi (Vizcaya).

The Compact VERT format includes a set of specific, portable hardware capable of generating the virtual reality experience in any place that meets a few simple specifications. By means of screen projection, running the software and virtual reality glasses, trainees are introduced into a realistic treatment room with elements such as the linear accelerator, couch, immobilization devices and image acquisition systems (kV



and MV). Interactive 3D replicas of the most popular brands and models of accelerators on the market (Elekta, Varian) are available, allowing interaction with all the moving parts involved in the treatment (jaws, multileaf, collimators, gantry, etc.). In addition, the couch has all the components and degrees of freedom.



Compact VERT enables a wide range of training activities in a safe, interactive, and realistic environment. Some examples include:

- Familiarization with the various parts of the accelerator.
- Internalization of the arrangement of elements in the room.
- Learning the various patient positions on the table along with the immobilization devices.
- Visualization of 3D anatomical structures.
- Visualization of real 3D medical images. Fusion of MRI, CT, PET images.
- Realistic reproduction of different treatment techniques: VMAT, IMRT, 3DCRT, electrons, etc.
- Visualization of complex theoretical concepts: surface source distance, isocenter, etc.
- Simulation of real errors and visualization of their impact on treatment.
- Loading of treatment plans with the option of importing your own plans.
- Familiarization with the quality controls of machines and peripherals.
- Visualization of dose maps on the patient.

Calasanz Lanbide Ikastegia is thus at the forefront of comprehensive training in radiotherapy. The VERT tool is added to the Certificate of Higher Education in Radiotherapy and Dosimetry, although it can also be used in the Certificate of Higher Education in Diagnostic Imaging and Nuclear Medicine, and, in general, in other VET modules in the health field for the visualization of internal anatomical structures (Nursing assistant, Clinical and biomedical laboratory, as examples).

The Compact VERT modality facilitates the transfer of this simulator to other centres in the region, whether they are VET centres, hospitals, private clinics, etc. Its use can be extended to the development of courses or complementary training activities, within the framework of continuing education.



This allows other ways of teaching radiotherapy in synergy with entities such as hospitals or radiotherapy departments.

If you are interested in the virtual reality simulator VERT for teaching radiotherapy, you can access [here the webinar](#) on demand in Spanish or contact us at the [following link](#).

More information

- **VERT, el simulador virtual para mejorar la enseñanza de radioterapia.**
- **El simulador VERT aplicado en la educación de pacientes de radioterapia.**
- **Colaboración de Virtual con Orfit: sistemas de inmovilización en el simulador VERT.**
- **VERT Flex, una modalidad más económica para la enseñanza virtual de radioterapia en centros educativos.**

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