



DIGITALIZATION FOR EDUCATION (D4E)

Virtual reality for better professional skills

August 2018

Background

Many employers in Uganda have raised concerns about the quality of graduates from technical and vocational institutes, claiming that they lack the necessary skills expected in a work environment.

In response to their concern, the government of Uganda developed a ten-year strategic plan for Business, Technical, Vocational Education and Training (BTJET), dubbed Skilling Uganda (SU). It aims to install a comprehensive system of skills development for employment, enhanced productivity and growth. The main objective of the strategy is to create employable skills and competencies that are needed in the labour market.

Enabel, the Belgian Development Agency is one of the partners supporting the implementation of this strategy through its project Support to Skilling Uganda (SSU).

Virtual Work Based Learning

One of the main targets of Skilling Uganda is to close the gap between the world of training and the world of work, by introducing initiatives such as work-based learning. The aim of work-based learning is to expose trainees to the realities of the private sector in order to learn and develop workplace competencies. In this way, Skilling Uganda hopes to successfully adapt training to labour market needs.

In remote areas, such as the agro-pastoral region of Karamoja in North-Eastern Uganda and refugee settlements in Northern Uganda, the limited number of companies is a stumbling block to the introduction of work-based learning. To address this challenge, Enabel in Uganda has embraced the use of virtual reality (VR) at grassroots level.

Virtual Reality (VR) to the rescue

To expose students in remote areas to the reality of the labour market, Enabel in Uganda is piloting a VR skills channel. It produces short term 'How to' clips to provide viewers with a virtual immersion into real work settings.

In June 2017, VR technology was piloted for the first time as an ICT support to a training for hand pump mechanics at the refugee settlements in Northern Uganda. The ambition is to





scale up the production of such 'How to' clips to enhance skills development in a wider set of trades.

How it Works

The idea behind the VR pilot is to **keep it simple**. In practice, only four digital tools are used to carry out the virtual reality experience; a **360° camera**, a **smart phone**, a **VR app** and **VR glasses**. The entire VR pilot described here, costs less than 1000 euros.






A trainee immersed by the virtual reality experience during an instant skills training session at Bidibidi refugee settlement in Northern Uganda, June 2017



Belgium's Deputy Prime Minister Alexander De Croo gets a feel of how Enabel exposes trainees in refugee settlements to a VR clip on 'how to' assemble a hand pump at Lokopio Hills Technical Institute in Northern Uganda, June 2017



PROCESS OF DEVELOPING A 360° "HOW TO" CLIP

PROCESS	ACTIVITY
<p>UP-STREAM</p> 	<ul style="list-style-type: none"> • Find a company: liaise with Uganda's private sector to access facilities, such as a workshop, a garage, etc. • Record 'How to' video clips using a 360° camera: focus on specific trades and concentrate on a particular activity with well-defined learning outcomes
<p>MID-STREAM</p> 	<ul style="list-style-type: none"> • Inject spatial media metadata: Add metadata to a video file to achieve a 360° effect • Upload on YouTube 360° channel: YouTube automatically uploads footage as a 360° video on the basis of metadata used
<p>DOWN-STREAM</p> 	<ul style="list-style-type: none"> • Download videos on micro SD card for offline access to VR clips • Watch in class: Trainees can watch the videos in class as teaching aids using simple VR glasses or google cardboard viewer.



Why?

- **Immersion into a trade.** The VR technology creates an immersion effect that makes viewers feel as if they are physically present at the sites where the action in the video took place. This gives them an insight into what actually happens in a top-end workshop. The viewer is almost literally projected into the kitchen of a five-star hotel or into the garage of a well-established automobile brand.
- **Fun to watch.** VR attracts young people, grabs their attention and gives them a playful way out of their daily environment (such as a refugee settlement).

Where?

To ensure permanent access to the video clips, an openly accessible, reliable and free VR repository is required, ideally based on an open source platform. For this pilot, the YouTube 360° channel was chosen.

By simply uploading the 'How to' clips on YouTube 360 and by labelling them with specific hashtags (#VRskillschannel, #SkillingUganda, #Carpentry #WaterPumpMechanics, #MotorVehicleMechanics), a **Skilling Uganda environment** is created.

Who?

- Enabel in Uganda works closely with Ugandan companies (champions of industry) to make this happen. Bottom-up production of videos enables public-private partnerships between training providers and companies, and it provides better visibility for local champions (product placement).
- The skills development trainees or anyone interested in a certain skillset can access the VR 'How to' clips of their choice anywhere at any time by simply filtering on the hashtags, as part of a 'Ugandan virtual learning environment'.
- For off-the-grid classroom use in remote areas such as refugee settlements, the clips are downloaded and saved on a number of devices.





So far, the following clips are available

TRADE	CONTENT	PARTNER
Carpentry	How to spray a wooden product https://www.youtube.com/watch?v=b2ZAWM0UbTI #Carpentry #VRskillsChannel #SkillingUganda	St Simon Peter's VTC
	How to smoothen wood https://www.youtube.com/watch?v=cEkkMI7-6y8&t=34s #VRskillsChannel #Carpentry #VirtualReality #SkillingUganda	St Simon Peter's VTC
	How to drill holes using an electric machine https://www.youtube.com/watch?v=RpiO_z1dyEQ #VRskillsChannel #Carpentry #SkillingUganda	Super Furniture
Motor Vehicle Mechanics	How to fix a car bumper https://www.youtube.com/watch?v=EhJ6J5uRck0 #MotorVehicleMechanis #VRskillsChannel #SkillingUganda	St Simon Peter's VTC

What?

The VR pilot is meant to develop into a repository of VR clips for work-based learning, including but not limited to the following trades in Uganda:

- **Green skills:** fuel/energy efficient stoves, briquette making, electronics repair, forestation/tree nursery bed management;
- **Agriculture:** organic pesticide and fertilizer production, fruit & vegetable cultivation and processing, post-harvest handling/value addition in agriculture, animal health management, bee-keeping and value addition to honey bee products, fish processing and handling.
- **Construction:** masonry/brick laying, tile and glass fitting, plumbing, painting and decoration/interior designing, landscaping and gardening.
- **Handcraft:** ceramic production, weaving and mat making, leather work and shoe-making, tailoring and garment cutting, manufacturing, blacksmithing, entrepreneurship. Hairdressing/barber, car washing, car battery charging and repair, soap making, baking, photography and audio production.