



European
Commission

Going digital: Simulations and gaming in apprenticeships

Date: 10 June 2021

Location: Brussels, Bayton, Bergara, Utrecht, Kokkola

Employment,
Social Affairs
and Inclusion



Structure of the webinar

- 1)** Introduction: Why we need to digitalise apprenticeships (*Tim SCHREIBER, EC*)
- 2)** Warm up question on potential of simulations and gaming (*Simon BROEK, Ockham IPS*)
- 3)** Where do simulations and gaming sit in the digital apprenticeships landscape?
(*Andrew MCCOSHAN, Plexus Research & Consulting*)
- 4)** Best practice examples (moderated by *Simon BROEK*):
 - Simulations in apprenticeships in the Industry and Transport sector
(*Petri AHONIEMI, Central Ostrobothnia Vocational College (KPEDU)*)
 - Application of serious games and VR simulators in VET
(*Unai ZIARSOLO, CIFP Miguel ALTUNA*)
- 5)** How to integrate simulation and serious games into apprenticeships
(*Alessandro BROLPITO, ETF*)
- 6)** Q&A



Introduction

Poll question:

1. What is the potential of simulations and gaming?

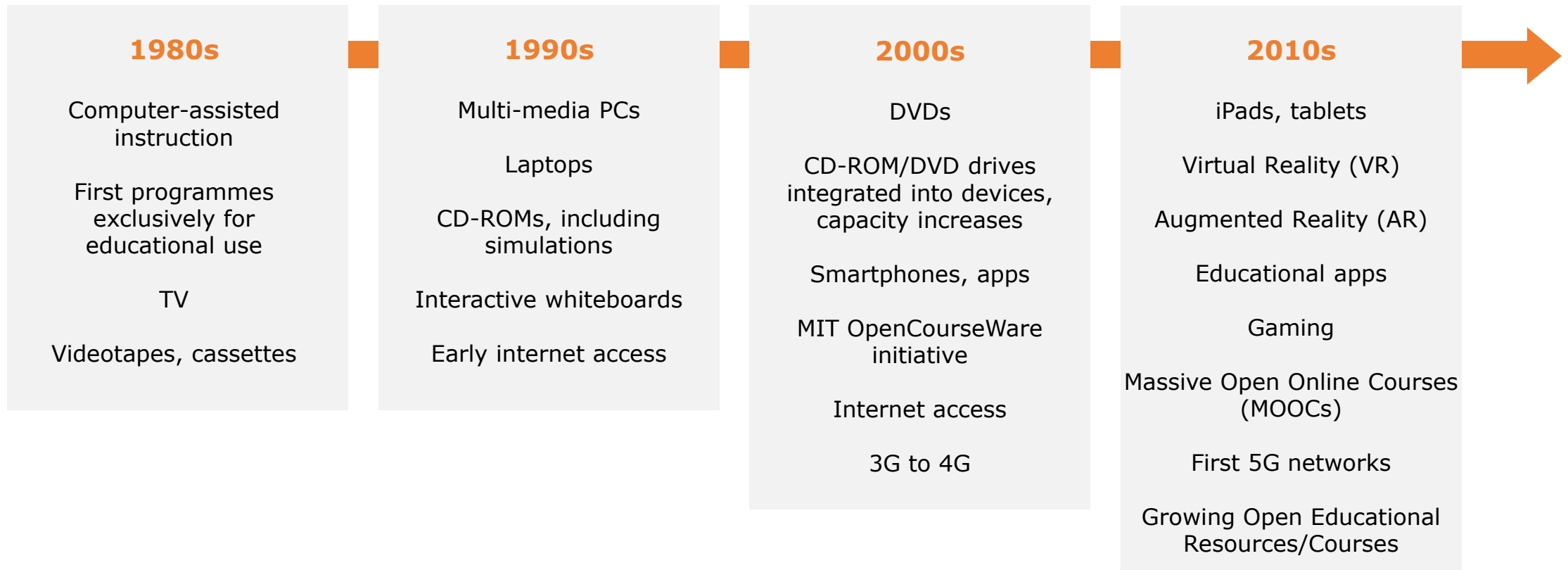
- Apprenticeships should only be a real-life work experience
- Simulations and gaming can reduce costs in apprenticeship training, but real-life work experience is better
- Simulations and gaming can enhance the learning experience in apprenticeships, as learners can experience more diverse work settings in a simulating environment
- Simulations and gaming can, to a large extent, replace real-life work experience in apprenticeships





Where do simulations and gaming sit in the digital apprenticeships landscape?

How did we get here?



How does tech relate to teaching and learning?

Digital technologies

- Online resources, tools and programmes, MOOCs etc.
- Commercial platforms, LinkedIn, YouTube
- Mobile learning
- Simulations – VR, AR
- Gaming
- Artificial Intelligence (AI)/learning analytics
- Assessment tools, credentials, open badges



Teaching and learning

- Embodied
- Experiential, learning-by-doing
- Social/collaborative
- Project-based
- Game-based

Simulations and games meet teaching

- **Experiential learning** – Digital simulation and gaming can enhance type and scale
- **Game-based learning** – A good fit with important aspects of apprenticeships, and expansion has the potential to bring a number of benefits
- **Social and collaborative learning** – A key strength of gaming
- **Blended** – How might blended learning be applied to situations where two learning environments are involved – the classroom and the workplace?
- **Assessment** – Widens evidence for assessment; speeds up feedback; improves links between assessors and learners
- **Linking schools and workplaces** – Improves coordination of knowledge acquisition and practical learning

Simulations and gaming enable social/collaborative learning, project-based learning, learning-by-doing, learning related to real-world issues, and learner-centred teaching

All help to develop the skills needed in the modern workplace

Some positives of simulations and gaming

Positives

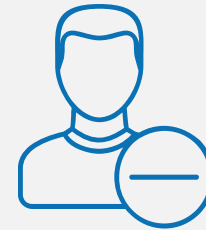
- Support pedagogical innovation
- Visualise abstract content
- Offer learners new, different experiences
- Can improve learner motivation and engagement
- Can decouple learning from time and place
- Support personalisation
- Support social learning in communities
- Faster, more tailored feedback for learners
- Simulations are cheaper than the real thing (once developed), reduce preparation/clean-up time, enable more practice, and are safer



Some challenges related to simulations and gaming

Issues

- Rates of digitalisation have historically been slow in work-based learning compared to other sectors
- How much of a barrier are high development costs, and do they lead to inequalities?
- How much are simulations and gaming *improving* how people learn?
- Simulations remove people from the real workplace experience
- Health issues in VR, AR, AI
- How far do they currently enable content creation by teachers and learners?
- How do teachers and trainers know what is a 'good' product?



Question:

What other pros and cons are you aware of?





Best practice examples of simulations and gaming



Simulations in apprenticeships in the Industry and Transport sector

KPEDU IN FIGURES 2020



The amount of authorisations to provide education

2733



Annual student years

2646

Degrees

★ 60



Accomplished degrees

1081

 4,25

Student satisfaction rate (1-5) at the end of studies



Degree students

4890

Staff

427

Folk high school

92,6

student years



Osuva koulutus Ltd



49

student years

Number of our students in foreign exchanges

45

Amount of exchange students in Kpedu

36

National Skills competition

21 Semifinalists

6 Finalists

Projects

2,1 M€

61

Turnover

36,2 M€



Profit 1,3 M€

Transfer of skills

“Everyone has their own learning path, their own story.”

“There must be a safe learning environment for learning skills.”

“The teacher is a guide who points the way in the right direction.”

“Combine a high level of simulation pedagogy with an enthusiastic, professional teacher, and good things will happen.”



Soft skills

To be a professional, good employee, students need:

"Courage" "Competence" "A feeling of belonging to a group" To make a **"leap of faith"**
"Confidence" "Learning" "Understanding" "Listening" "We need to **make it possible**"
"Friendliness" "Interaction skills" "A combination of good teaching, simulation pedagogy, and robotics"





Photographs by Mrs. Eeva Huotari







Photographs by Mrs. Eeva Huotari



Application of serious games and VR simulators in VET

Summary

-  Some issues to overcome in hands-on training
-  Digitalisation
-  Examples of gamification:
 - #1 Behilab** – 3D software for beef cutting
 - #2 Auto game** – Electrical troubleshooting in cars
 - #3 Drone flight** – Flight practices with drones
 - #4 Control of the Asian hornet** – 2D game to learn the control and elimination protocols
-  Conclusions



Hands on training: Issues to overcome

Hands-on training poses issues to overcome, including related to:



Physical safety of students



Expensive equipment



High cost of consumables



Preparation time required for real exercises



Digitalisation

The new generations
are digital

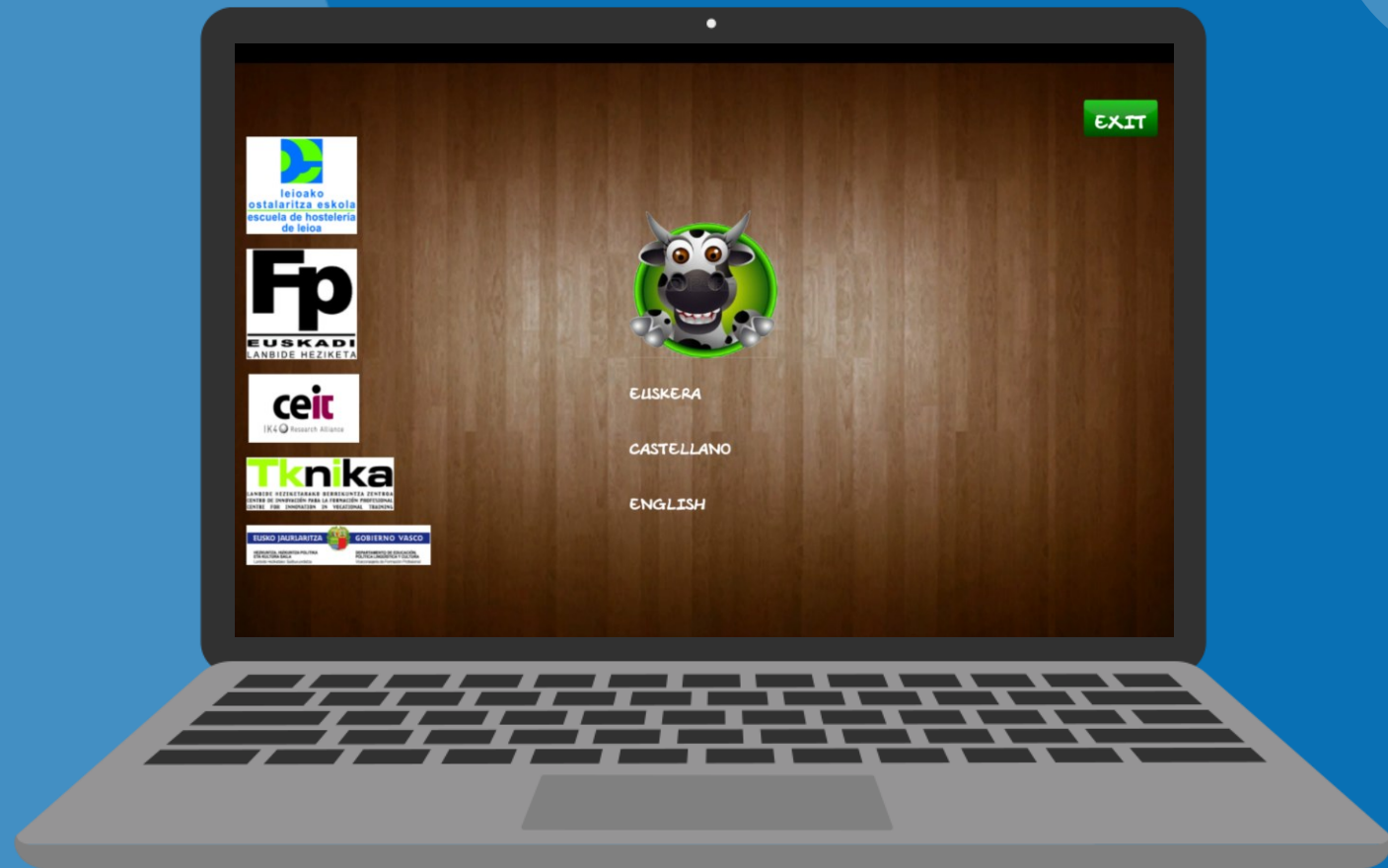


Source: EITB

Example 1: Behilab

Beef cutting

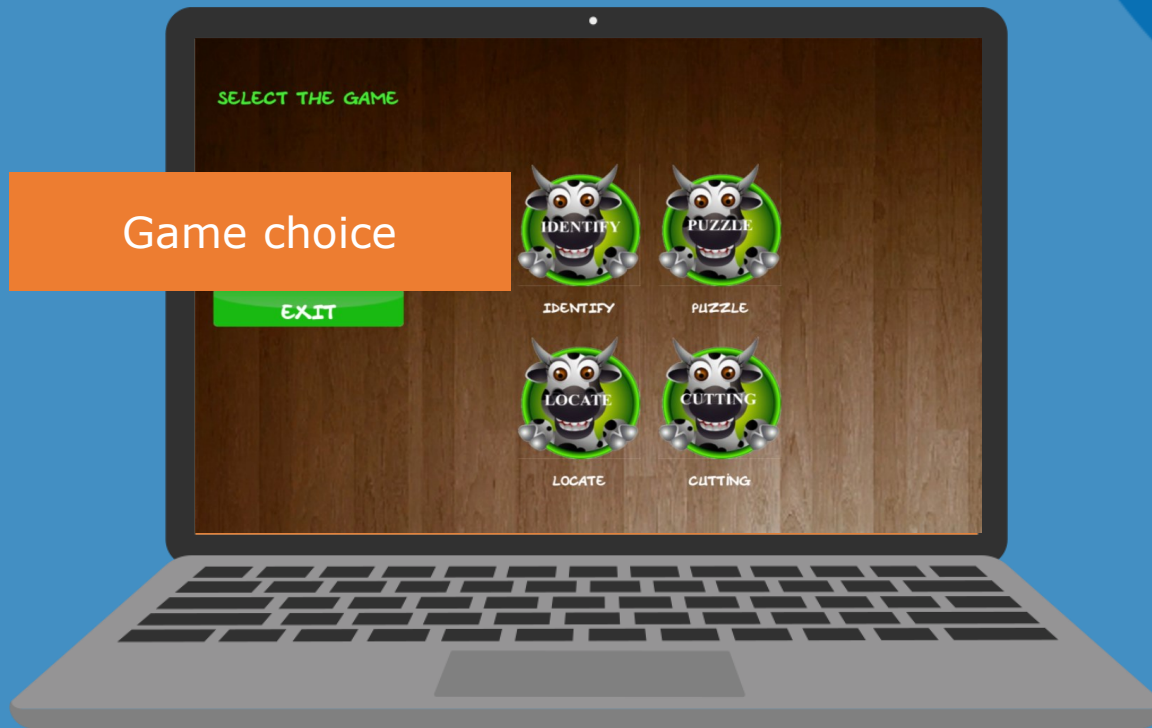
Non-immersive serious game to train on meat cutting, mainly beef



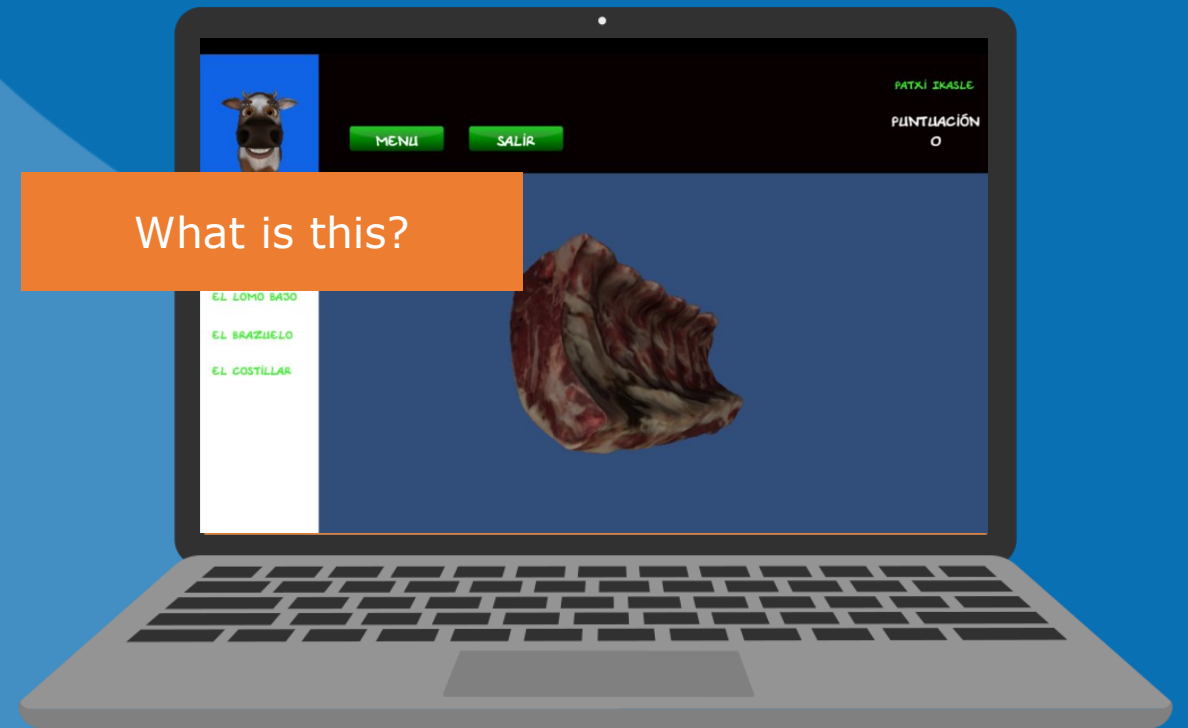
Source: Tknika



Menu and identification of parts



Source: Tknika

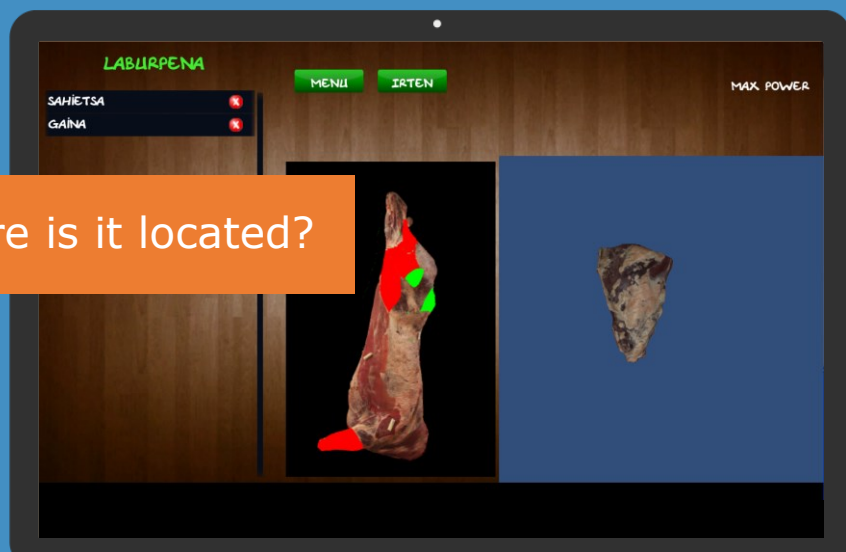


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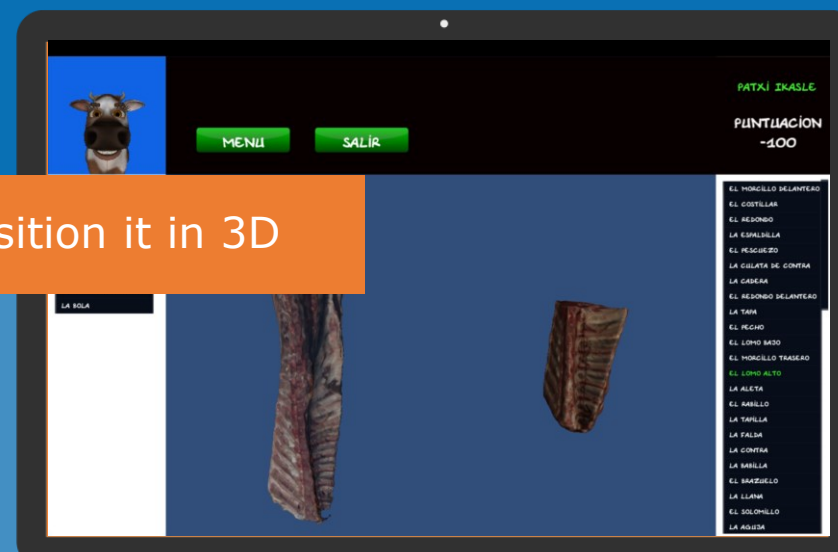
Location on the carcass and puzzle



Where is it located?



Position it in 3D

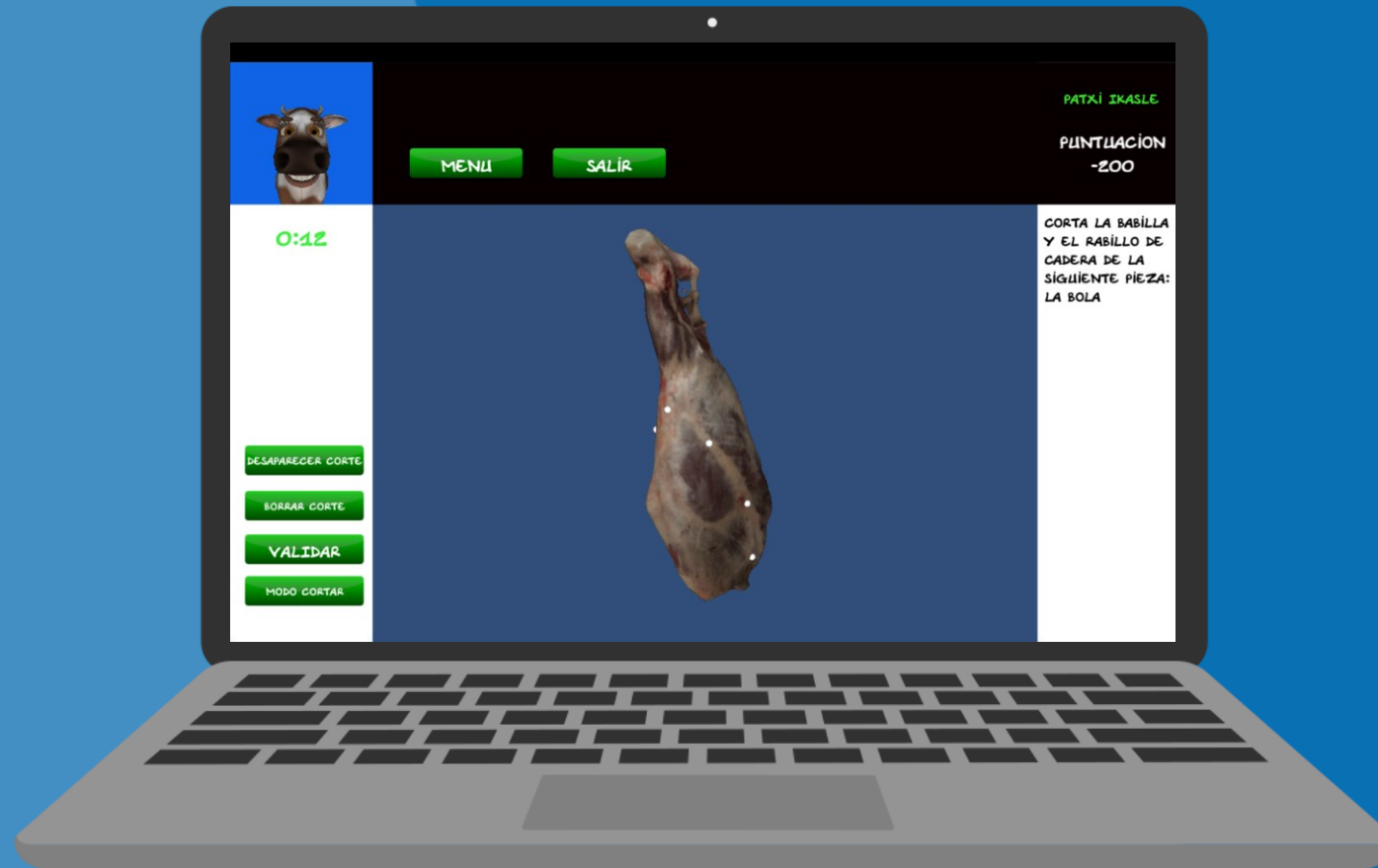


Source: Tknika

Source: Tknika

Quartering

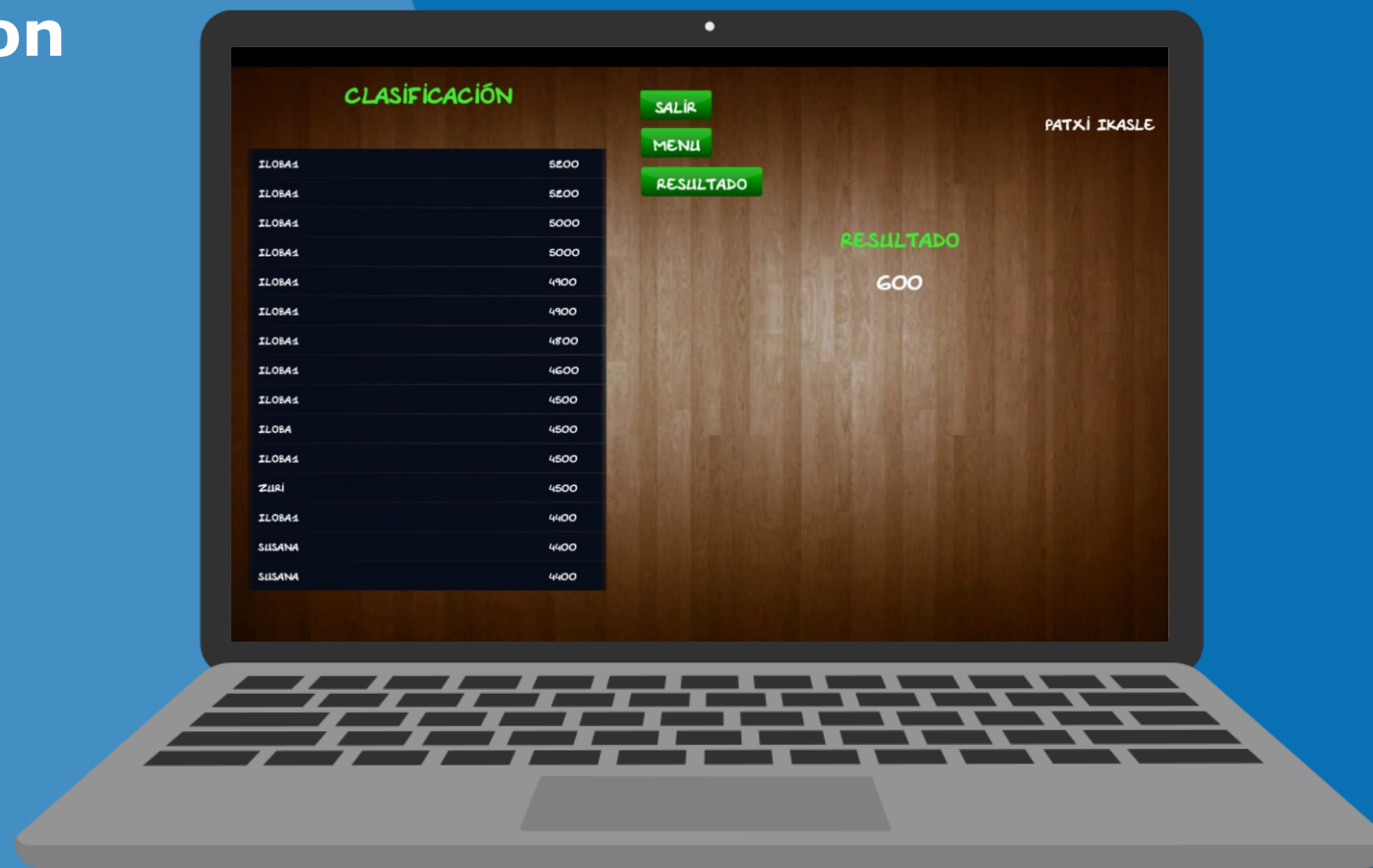
Where should it be cut?



Source: Tknika

Obtained result and final classification

Final ranking



Source: Tknika



Example 2: Auto Game

Simulator for the detection of electrical faults in automotive vehicles

Profesor

- Alces**
 - DMM
 - 20MM
 - 6 DMM
 - abc
 - PRU
 - PRU2
 - prU3
- Aver-las**
 - abcdafghj
 - averia01
 - Averia02
 - fFRO-1
 - pppp
 - Pruebal
 - Pruebr averia
- Otros**
 - PRUEBA-01
 - Pruebr otros

VOLTAGE MEASUREMENT
YOU WILL HAVE TO LOCATE THE FAULT WITH THE DIFFERENT TOOLS. SCORING AND RANKING WILL BE BASED ON THE NUMBER OF MEASUREMENTS, PENALTIES FOR SERIOUS ERRORS AND TIME SPENT.

AUTO GAME

Estudiante: Albizu [Salir](#) (Contraseña) [eu](#) | [es](#)

What is Auto Game?

It is a serious game that aims to practice in the identification of faults in electrical circuits of vehicles. You just have to identify yourself and start learning by playing.

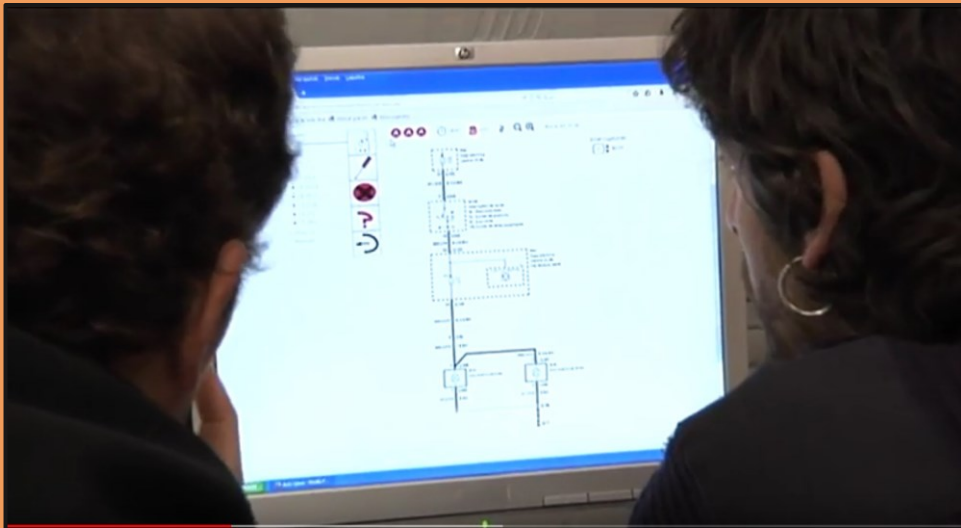
Ver demo

Source: Tknika

Source: Tknika

From play to practice

Students put into practice what they have learnt in the simulation



Source: Iurreta LHII

Source: Iurreta LHII

Example 3: Drone flight

Different drones and
different practice scenarios

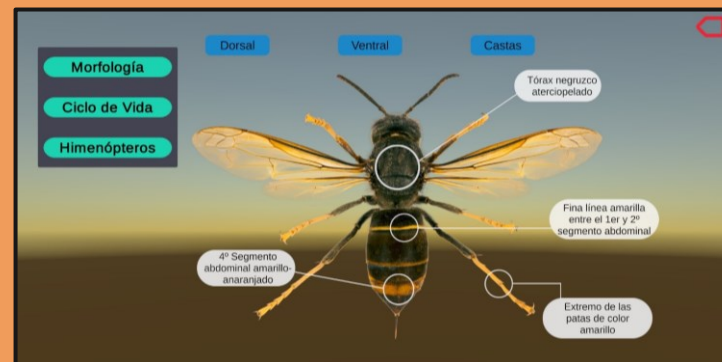


Source: Realflight



Example 4: Control of the Asian hornet

The student can assume the different roles in the process of detection, control, and elimination of the insect



Source: Gijón City hall



Conclusions

VR and serious games are an attractive alternative to overcome challenges such as security, equipment costs, and accessibility in VET

Advantages



- Big groups of students can play simultaneously
- Can be used individually (e.g. at home)
- They are very suitable for repetition learning

Disadvantages

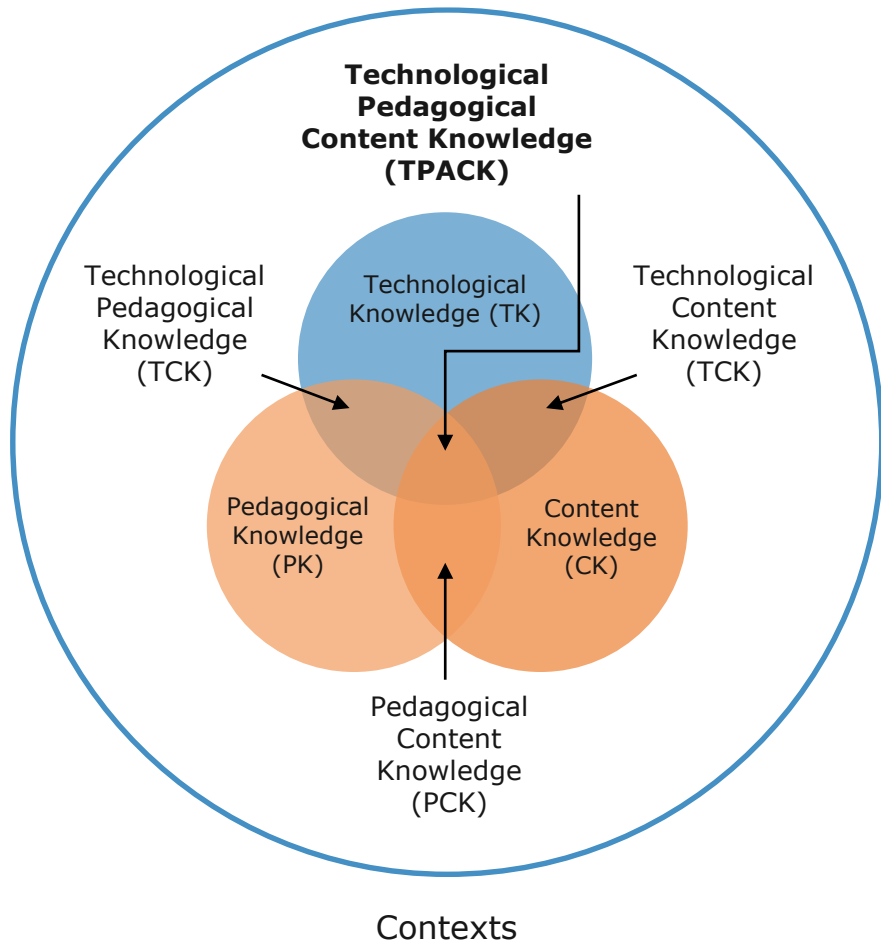


- Miss of the feeling of real experience



How to integrate simulation and serious games into apprenticeships?

The TPACK framework



Integration of digital technologies in teaching and learning requires significant educational innovation and implies a process of planning for pedagogical, technological, and organisational change



School managers have to ensure a strategic approach and an open and fertile environment



Educators need to feel confident and competent in using and designing appropriate learning experiences for their learners



Students need to be actively involved

Use of digital technology in teaching and learning

Aim

- Responsiveness to learners/labour market/societal changes
- Engaging learning experiences

Driven by pedagogy

- Learner and teacher centered approach

Examples

- Personalised learning
- Authentic learning in an increasingly digitalised economy and society

Preconditions

Development of a high-performing digital education ecosystem

- Infrastructure, connectivity, and digital equipment
- Digital planning and development, and organisational capabilities
- Quality and engaging digital learning resources and tools

Enhancing digital skills and competences for the digital transformation

- A matter of skills, knowledge, and attitude
- Self-regulatory processes: Adaptation to feedback they receive from teachers, but also from digital environments (peer feedback and educational software)

How to assess and improve capacity at local level

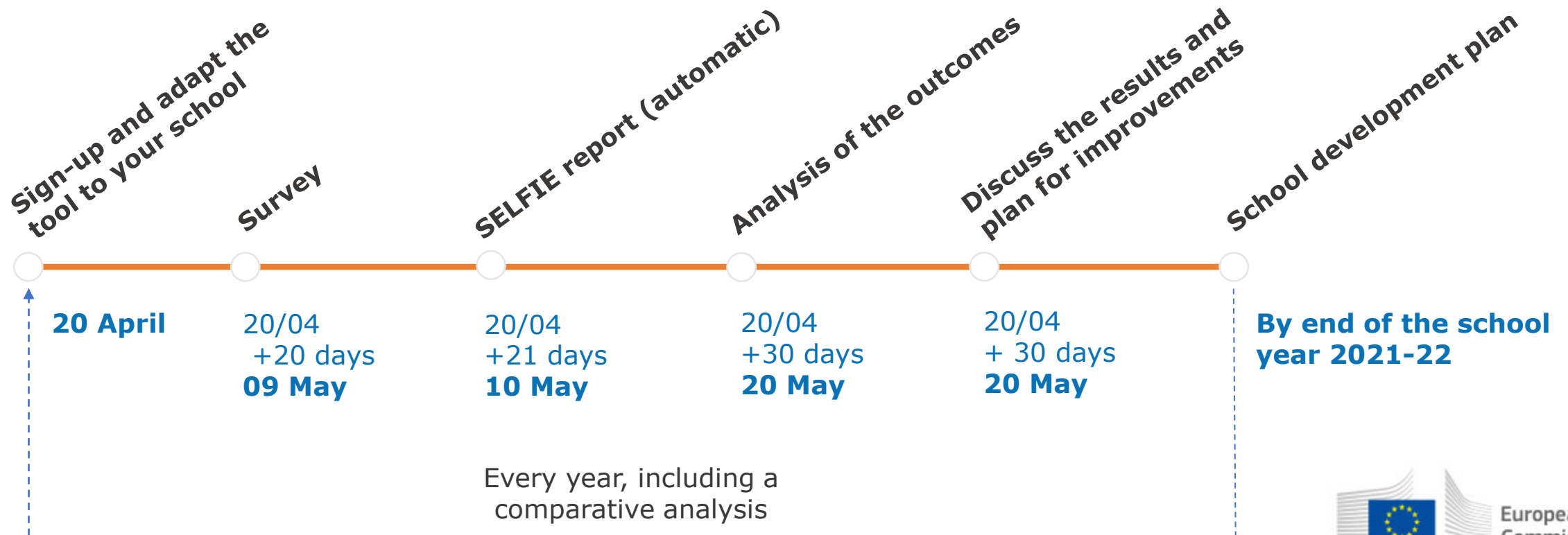
SELFIE work-based learning systems

Launch: Q3 2021

- Collective self-reflection process, including trainers, learning organisations
- Holistic and tailored survey, comparative reports, eco-system for 'actions'
- Methodological support: Survey outcomes -> strategy -> development plan

SELFIE (WBL) into action

Example of the SELFIE process being piloted in Ukraine to implement SELFIE in schools, including VET



Further questions?



For any additional questions, please contact:

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**Thank you for your time
and attention!**

**Watch out for other
upcoming EAfA events!**