Title: Assessment in Healthcare EducAtion goes Digital

Acronym: AHEAD

KA220-VET - Cooperation partnerships in vocational education and training

Grant Agreement No: 2021-1-IE01-KA220-VET-000034699

'AHEAD' project overview

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AHEAD

The 2.5 years (Nov. 2021 – May 2024) Erasmus+ funded project: ***Assessment in Healthcare EducAtion goes Digital* 'AHEAD'** aims at enhancing digital assessment in the field of healthcare education across four European countries (Ireland, Germany, Georgia and Poland)

Partners:

▶ Medical University of Lodz (MUL, Partner) – Nursing

▶ Hanse Institut Oldenburg (HIO, Partner) – Surgical & Anaesthetic Assistants / Nursing

▶ Ilia State University (ISU, Partner) – Medicine

▶ Dublin City University (DCU, Lead) – Nursing, Computing, Teaching Enhancement Unit
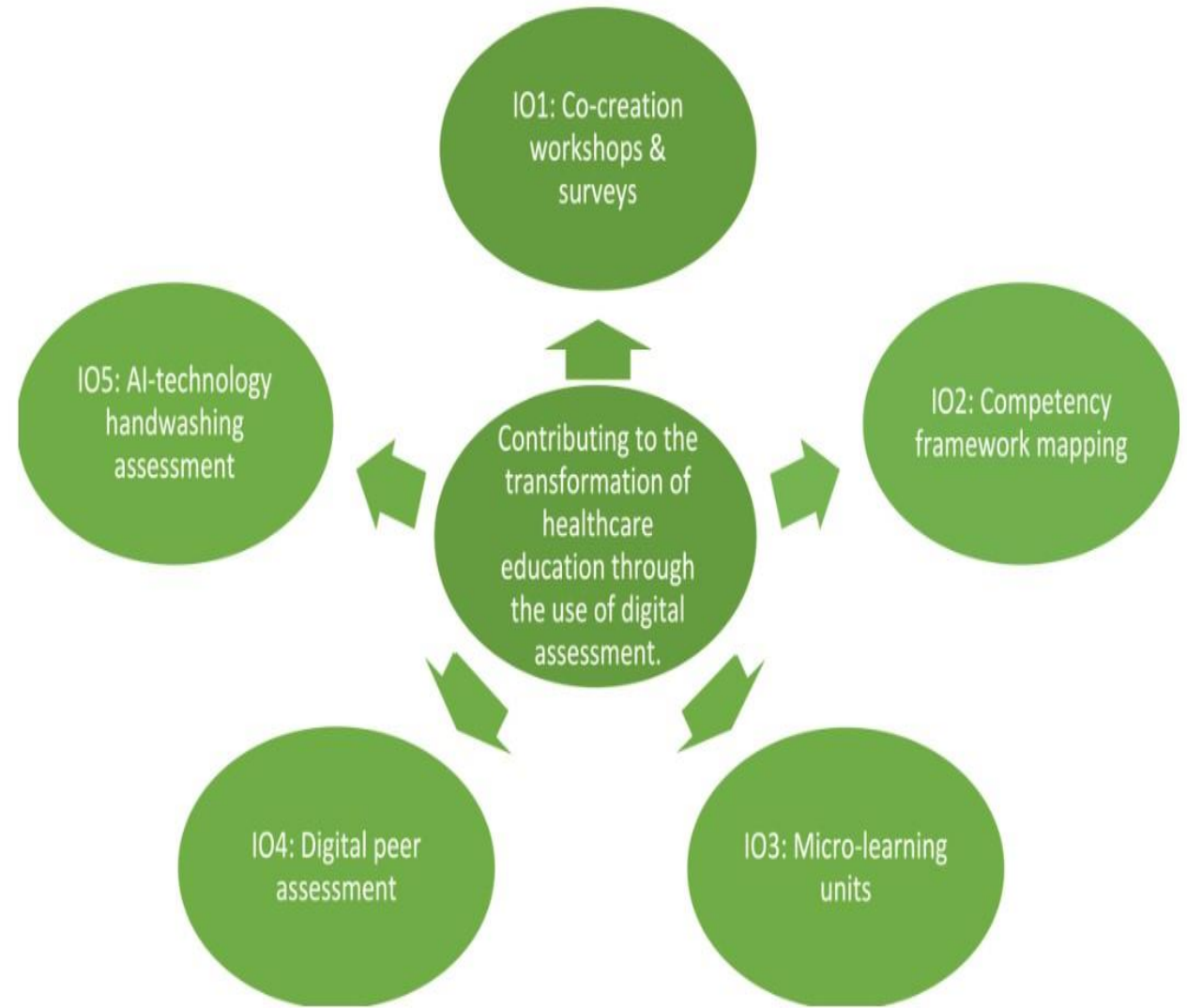
Project Results

1. In this output, we are involving participants from each partner institution in co-creation workshops and surveys to develop insights into teachers' and learners' digital transformation needs.

2. A competency framework for teachers and learners in health care education in the field of digital assessment will be developed.

3. Micro-learning units will enhance teacher- and learner competencies and assist in the integration of digital assessments in their teaching and learning practice.

4. In this output, project partners will develop a digital rubric and peer assessment where students can provide peer feedback on a video-recorded skill. Students will be empowered to become involved in assessment and to impact on the grade awarded to learners for a healthcare related skill.

5. A video-based assessment using Artificial Intelligence and including an open source digital badge as evidence of achievement will be developed and tested within this project.

IO1: Co-creation workshops & surveys

IO5: AI-technology handwashing assessment

IO2: Competency framework mapping

Contributing to the transformation of healthcare education through the use of digital assessment.

IO4: Digital peer assessment

IO3: Micro-learning units

Project Result 5:
AI handwashing technology

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PR: 5

Handwashing was identified as a universal skill in healthcare and across project partner institutions

➢nursing, medicine, surgical assistants

A video-based handwashing assessment was developed to engage learners in skills development..

- The Artificial Intelligence technology used in the video-based assessment will empower students to learn independently, as they can practice the skill as many times as they wish before submitting the final version for assessment.

- Green lights on the AI panel indicate that the correct hand washing steps have been carried out

- A digital badge is issued upon successful completion

Curriculum review

Scoping exercise to establish curriculum content at partner sites and to share existing skills videos

How was handwashing taught at partner sites?

How was handwashing assessed?

Resources e.g. at DCU large numbers of students are taught and assessed on handwashing every year as a mandatory skill – resource intense as it involves many lectures over a prolonged period of time

WHO Guidelines

Development of handwashing guide based on WHO (2009) guidelines

An additional hand washing step, wrist washing, was added as this is common procedure at all partner sites.

Figure II.2
How to handwash

Hand Hygiene Technique with Soap and Water

Duration of the entire procedure: 40-60 seconds

0 Wet hands with water;	1 Apply enough soap to cover all hand surfaces;	2 Rub hands palm to palm;
3 Right palm over left dorsum with interlaced fingers and vice versa;	4 Palm to palm with fingers interlaced;	5 Backs of fingers to opposing palms with fingers interlocked;
6 Rotational rubbing of left thumb clasped in right palm and vice versa;	7 Rotational rubbing, backwards and forwards with clasped fingers of right hand in left palm and vice versa;	8 Rinse hands with water;
9 Dry hands thoroughly with a single use towel;	10 Use towel to turn off faucet;	11 Your hands are now safe.

WHO Handwashing guide for AI Tool

WASH HANDS WHEN VISIBLY SOILED! OTHERWISE, USE HANDRUB
Duration of the entire procedure: 40-60 seconds

1. Open tap (using hand or electronical sensor)
2. Wet hands with water
3. Apply enough soap to cover all hand surfaces
4. Rub hands palm to palm
5. Right palm over left dorsum with interlaced fingers
6. Left palm over right dorsum with interlaced fingers
7. Palm to palm with fingers interlaced
8. Backs of fingers to opposing palms with fingers interlocked
9. Rotational rubbing of left thumb clasped in right palm
10. Rotational rubbing of right thumb clasped in left palm
13. Rotational rubbing with right hand on left wrist
14. Rotational rubbing with left hand on right wrist
11. Rotational rubbing, backwards and forwards with clasped fingers of right hand in left palm
12. Rotational rubbing, backwards and forwards with clasped fingers of left hand in right palm
15. Rinse hands with water
16. Dry hands thoroughly with a single use towel
17. Turn off tap by using elbows, tissue or electronic sensor or use paper towels to turn off taps
18. Dispose the tissue appropriately

Colour illustrations by www.clinicalskills.net
Created by AHEAD Erasmus+ project | 14 July 2023

Figure 2. Prepared test space at DCU.

An expert at DCU School of Computing developed the model for the AI technology to be used in this project.

The algorithm works using a camera over a sink connected to a Raspberry Pi mini-computer which uses artificial intelligence (AI). The model runs on an Intel Movidius neutral compute stick, which is so small that all of the gear can be easily protected and stored in a specifically for the project designed 3-D case. The Movidius stick was programmed so that the camera detects activity i.e. when the participant is washing their hands.

A video demonstration was created, which is openly available on YouTube, and which was discussed with project partners

https://youtu.be/8LXsPZMv5j8
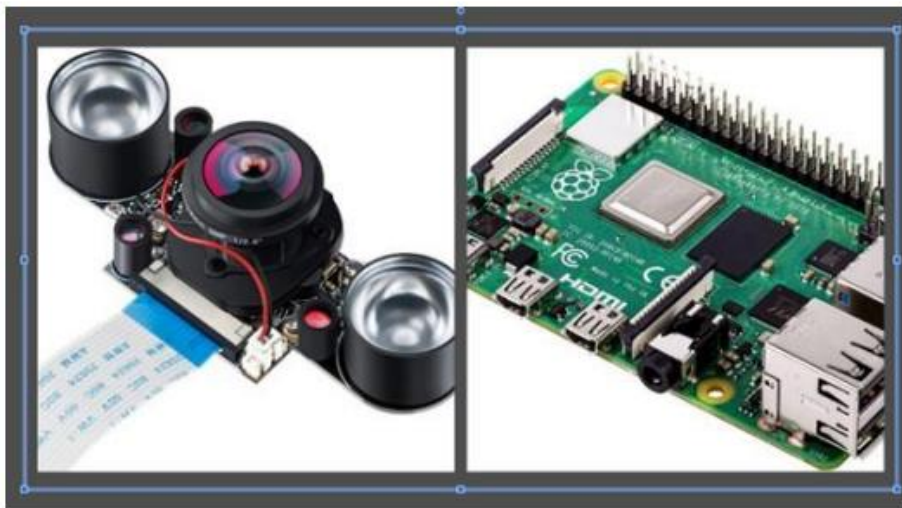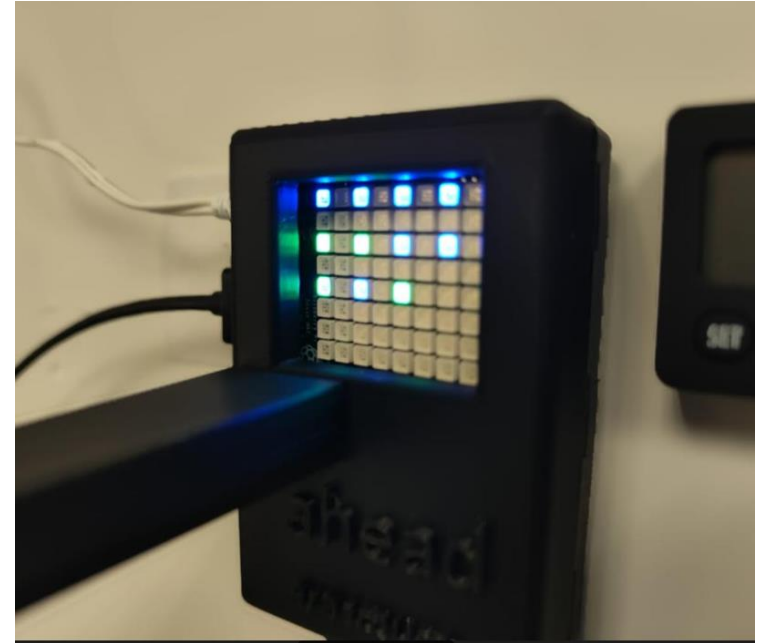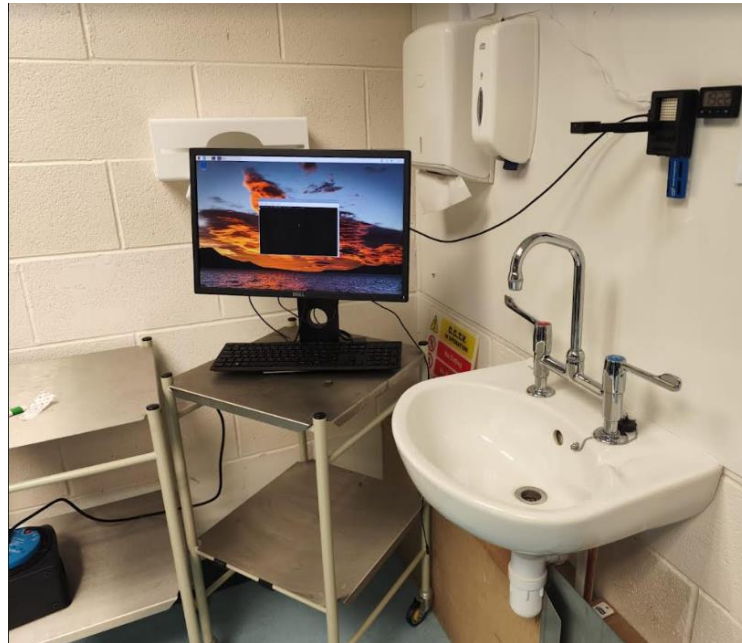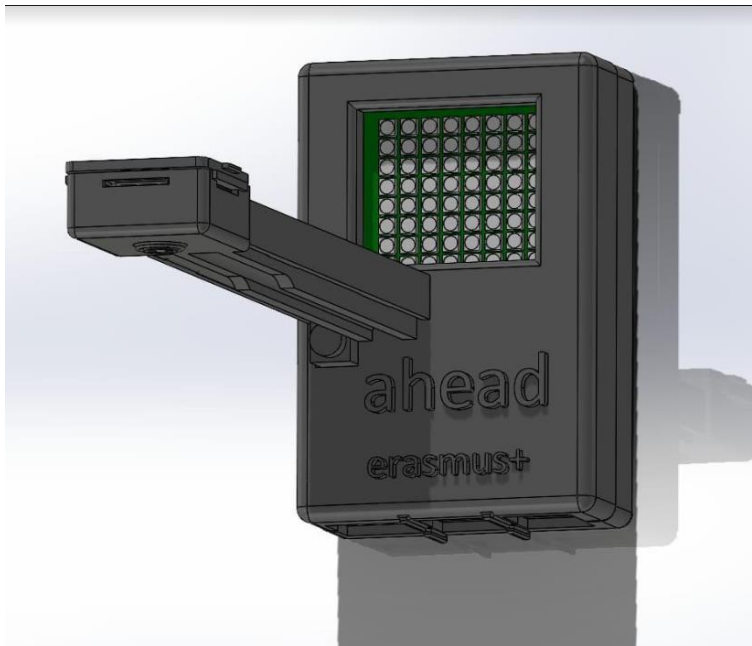
3-D case printing

Digital Badge creation

AI → ← Moodle

Next steps

Project Result 5 was successfully completed with a curricular content review, literature and existing skills video scoping exercise, device purchase, site preparation and installation across all partner institutions / countries participating in this project, AI model development and training, 3-D case printing and digital badge.

Screen display

Tablet device

Mobile unit

Portability

Diversity

Add hand rub