

# BuildEst II results, the experience of creating video learning materials

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# BuildEst II partnership

- Tallinn University of Technology
- Estonian Ministry of Economic Affairs and Communications
- Foundation Innove- NGO created by the Ministry of Science and Education responsible for coordination of vocational training centres
- Estonian Society of Heating and Ventilation Engineers
- Estonian Association of Construction Entrepreneurs



# Competeces related to energy efficiency in qualification standards

- Knowledge, skills and competences of energy efficiency described on **EQF levels 3–5**
- Energy efficient construction competences integrated into **28 qualification standards (on EQF levels 3–5)**
- Activities to **support popularization** of the qualification standards among the potential applicants
  - Vocational Training Centres
  - Unemployment office career counsellors
  - Regional career counselling offices



# Development of the energy efficiency competences among construction sector workforce

Non-qualified workforce	Qualified workforce
Energy efficiency skills integrated into <b>5 outcome-based national secondary vocational education curricula</b> (EQF level 4, 180 credits)	Energy efficiency skills integrated into <b>3 outcome-based curricula for continuous vocational training</b> (EQF level 4, 15 credits) * Heat pump installer * Solar heating system installer * photovoltaic system installer
Energy efficiency skills integrated into <b>15 outcome-based curricula for initial vocational training</b> (EQF level 3-4, 30-120 credits)	<b>Energy efficiency skills training program</b> (EQF level 4, 1 credit)
	Energy efficiency skills integrated into the <b>continuing education training program for master-foreman</b> (EQF level 5, 30 credits)



# Supporting implementation of the training schemes of energy efficiency competences

- **Principles of RPL** (recognition of prior learning and work experience) for non-qualified work-force to obtain the qualification.
- Methods for output based **evaluation of occupational competences**
- **Trainings for the members** of the evaluation committees to apply these methods in their work



# Supporting implementation of the training schemes of energy efficiency competences

- Training of **trainers** – 3 groups, total of 89 participants

Total amount of training 108 hours

- **Piloting** of trainings (16+8) hours

Total number of pilot trainees over 350

- 15 field specific training **materials** 20-40 pages each

Including methodological guidance, practical tasks, testing

- 20 units of **video training materials** 2-15 minutes each

Including methodological guidance, discussion questions, testing



# Sustainability

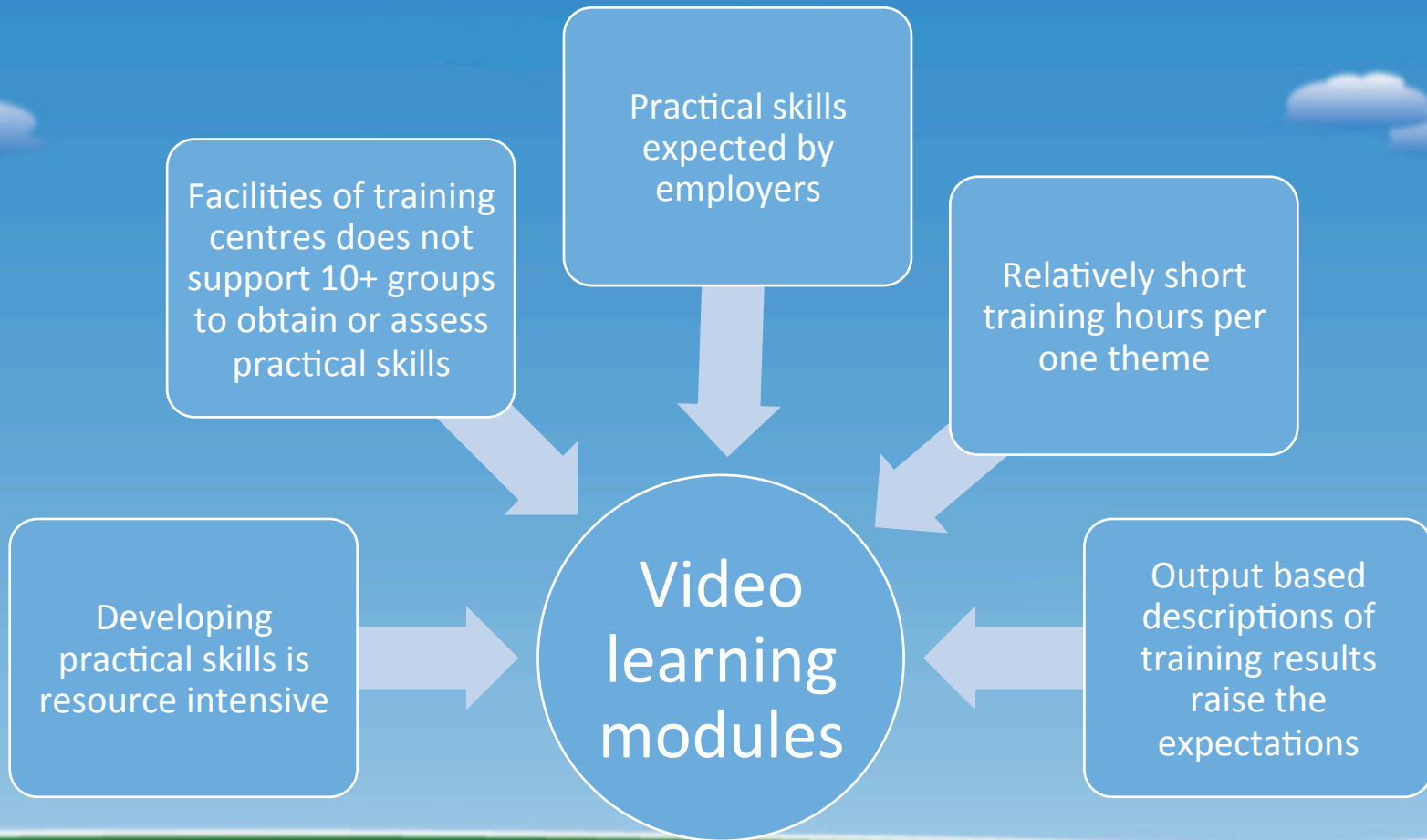
- Schemes and materials become part of **national curriculum in VET.**
- **Training programs are included in the training list financed by the Estonian Ministry of Education and Research**

In the spring 2017:

- 30 field specific courses in construction
  - 10 courses in HVAC installation
  - 7 courses in installation of renewable energy systems
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- Development of the system has actively involved wide range of stakeholders (ministry's, university, professional associations, training centers etc) in the sector so that it will meet their needs



# Why visual learning materials?





# The fields of video learning materials

- **Complex video materials about insulation of the HVAC piping (10-15 min)**
  - Insulation of the cold water piping with flexible foam cover
  - Insulation of ventilation flume with strengthened aluminium paper covered flexible mat wool
  - Insulation of the heating piping with folium covered wool
- Video materials about joining of ventilation tubes (3-5 min)
  - Joining a round ventilation duct with a elbow
  - Joining a retangle ventilation duct with a elbow
- Short video tutorials about correct joining of the parts of different pipe types (composit, copper, Pe-Xa, steel, galvanized steel) (5 x 5min)





# Insulation

<http://www.ttu.ee/buildest>

# Course of the activities

- **Establishing content, learning outcomes**
- **Securing effective filming process** (scenario, facilities, light)
- **Filming process** (about 3 hours per every 15 minutes)
- **Finishing the materials** (cutting, processing, audio, text integration, about 20 hours per video)



# Methodological guidelines for the trainers

- Videos accompanied by described **learning outcomes**
- **Introductory slides** for opening the theme – focusing on the reasons why a certain activity or work method is used
- Questions to facilitate **discussion**
- Questions for trainers possible to use in later **testing** of knowledge or skills



# Discussion questions example



Insulation of the heating piping with  
folium covered wool

# Example of questions for discussion or assessment

1. Please bring out at least two reasons why it is necessary to insulate piping?
2. At the same conditions the heat loss of the pipe is higher in which case – of a smaller diameter pipe or larger diameter pipe?
3. Non-insulated piping is present in a room with the same size and piping length. In one room the temperature is 20 °C and another similar room the temperature is 5 °C, in which room the heat loss of the piping is higher?
4. Under what angle is it necessary to cut the insulation material for a steep angle pipe?
5. Why does the foil covered wool need additional steel wire cross fixators?
6. Why is it necessary to have a clean and dustless area for preparation of the insulation materials?



# Answers provided and connected with the film for replay

- 1.Replay film at 1:25-1:58 s
- 2.Larger diameter, replay film 0:54-1:24 s and 2:15-2:28 s
- 3.In the lower temperature room (5 C) the heat loss is higher, replay film 2:28-2:38 s
- 4.The cutting angle is 45 degrees, replay film 3:43-4:00 s
- 5.For the insulation to stay fixed on the piping, replay film 8:24-8:40 s
- 6.When the insulation material is dusty the tape or cover material glue does not stick correctly, replay film 3:36-3:46 s



# Costs

Total filming activities cost in our project per 22 video units was ca 9800 euros.

- 20 video units finished, 2 left as raw material
- Mainly salary, some travel costs
- Free use of university MOOC department video filming equipment and processing facilities
- Facilities from VET centre and enterprises for free
- Large amount of voluntary work from enterprise representatives
- Materials given for free from enterprises





Thank you

[www.ttu.ee/buildest](http://www.ttu.ee/buildest)

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