



Documentation of pilots

Sensitizing for 4.0-Context of the authentic skilled work, EUF

Spring, 2020

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Introduction



This document contains the documentation of Virtual Prototyping, spring 2020. The document contains a description of the settings and the motivation of the case, as well as an overview of the key performance indicators (KPIs) for the pilot. The execution and documentation of pilots are part of a larger process, named Educational Framework, aimed at transforming educational programmes for future Industry 4.0 capabilities. The case with the pilot / courses is chosen based on two initial analyses, respectively focused on industry and the institution and the needs for the future and current and skilled work. For further information regarding the overall process, please see the document 'Educational Framework'.

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- Description of the case (summary)
- KPIs and how they are measured
- Implementation of the Educational Framework
- Results (KPIs) and evaluation



Description of the pilot (summary)



The case for the TEFFIC-project at the biat at the Europa-Universität Flensburg (Berufsbildungsinstitut Arbeit und Technik/Institute of Vocational Education, Work and Technology) combines two courses in the in Master-study-programme. The “Master of Vocational Education at Vocational Schools” is basing on relevant academic qualifications, like the Bachelor (EQF 6), Master (EQF 7) or “old”-Diploma (EQF 7).

These existing two courses are going to be developed / updated within the 4.0-domain and capabilities of the skilled workers (EQF 4) (see: EQF – European Qualification Framework for Lifelong Learning / CEDEFOP). In the case the students will get sensitized to focus the needs of 4.0-Changes (digitalisation and information, ICT, cross-disciplinary and international communication) at the companies, where skilled workers are employed or Vocational Schools.

The currently described case for TEFFIC and the focus on topics in the context of 4.0 is not only tied to the project TEFFIC. It is a logical consequence of maintaining the quality of the academic education of vocational teachers and thus also the vocational training and education of skilled work itself. As the definition of the areas of research show, we identify areas of study that are relevant to vocational training / skilled labour at the same time. Consequently, the central idea of a humane, ecological, economical and sustainable organisation of education, work and technology, that provides a developmental understanding of vocational education, serves as a research integration field.

This goal corresponds with the industrial analysis, which pointed towards interdisciplinary knowledge as a necessity (e.g. Netcompetence). This case is defined as a typical educational setting for future vocational teachers. It's their commitment to gain their knowledge and expand professional competences on current and future developments in work and technology being able to draw up future-oriented teaching. The connotation with 4.0 and Digitalisation is underlining the sustainable educational mandatory of the biat.

The master-student should be able to reduce didactics and address learning-content for their future learners – regarding to new technologies, cross-linked and interdisciplinary settings and ongoing changes within networking and digitalisation in work-life and society.

The case is about two courses / pilots / outcomes about the student experience and reflection of 4.0-Work and authentic work environments of their future TVET-students. Mainly the students will end up with an report, that is basing on their vocational scientific findings.

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Description of the pilot 1 / course 1 (summary)



The course, Vocational-Specialisation-Project , is based on the following operative goals :

It is about:

- **Focusing the the working load of skilled workers in the current and the future digitalised working world of skilled workers / in companies, to develop their 4.-0mindset in the sphere of their future vocational students.**
(E.g. to modify a FESTO-Unit (IoT and Smart Industry or Augmented Reality), to add RFID-Trackers, add an APP or robotic etc.)
- **Recognizing of current research on 4.0-topics and future working settings; visiting SMEs or industry or fairs in the region or in the network of the stakeholders of the biat, to clarify current/future 4.0-settings and needs of companies and vocational schools.**

This case aims to sensitize master-students for 4.0-needs and to handle them as normal content for their future teaching of future skilled workers at vocational schools. It will be about Enabling the teaching-competences of the students with the didactical-practical implementation of the construct of Netcompetence as a need for a sustainable education of 4.0-settings in the work- and learning-life of skilled workers and to be able to switch perspectives from engineer to skilled workers.

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Description of the pilot 2 / course 2 (summary)



The course, Vocational-Training-Study , is based on the following learning goals from the curriculum:

It is about:

Focusing the teaching of TVET-teachers:

- **e.g. a special task to create, execute and reflect an innovative competence-oriented teaching-and learning-arrangement with their class of electricians, mechatronics etc. – regarding to relevant 4.0-content**
- **Optimally, students build up the learning unit on the demonstrator of Course 1 reporting and describing future needs for TVET-teachers in the field of 4.0**

The motivation of biat relies to the digital skills of the EU, to enable learner and educators to be act as an active designer in digital society and to strengthen digital skills, linked to lifelong learning of students and educators. This intention, and the biat-reinterpretation of Netcompetence for 4.0, are basing on the key competences for LLL of the European reference framework for the personal fulfilment and development, through all eight competences (2006/962/EC : <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:32006H0962>; 22.02.19). In the case-courses biat-students focus one or some of these key competences/fields of the Netcompetence, with duty to link these to practical conversions of the all-day working world of their future vocational students.

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KPIs and skills



Knowledge about

- Future of vocational education
- 4.0 impact on academic and non-academic work and education

Skills within

- Shaping, design and construction of industrial products or technology problems on level of EQF4 and EQF
- Reducing and didacisation of content for vocational students
- Estimate theoretical and practical problems within the profession and propose solutions
- Communicate problems and tasks within different types of professions, disciplines and qualifications

Competencies to:

- Reducing and understanding complex, innovative and design-oriented problems and tasks in the real work life of skilled workers
- Identify gaps and problems within current education and companies, regarding to 4.0 relevant topics
- Filling gaps with competence-oriented learning-units and content



Implementation of the Educational Framework

Pilot 1 / Course 1

Completely self-directed by the student with the opportunity to get advices; support and collaboration opportunities with three different types of staff:

- Professor
- Research Associates (pedagogics, engineers or experienced vocational school teachers)
- Laboratory-engineers of the assignment is to describe how these sub-processes can be applied to their project.



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Implementation of the Educational Framework



Pilot 2 / Course 2

Preparation-Course / lecturer in one semester & two-four week of internship @ a vocational school; support by and collaboration opportunities with three different types of staff:

- Professor
- Research Associates (pedagogics, engineers or experienced vocational school teachers)
- Vocational teachers @ the internship-school

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Implementation of the Educational Framework

Relation of Authentic Task Design to the self definition of biat and vocational training



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Results and Evaluation

[A description of the results (KPIs) and an overall evaluation of the pilot. This is filled in after the pilot is executed]



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