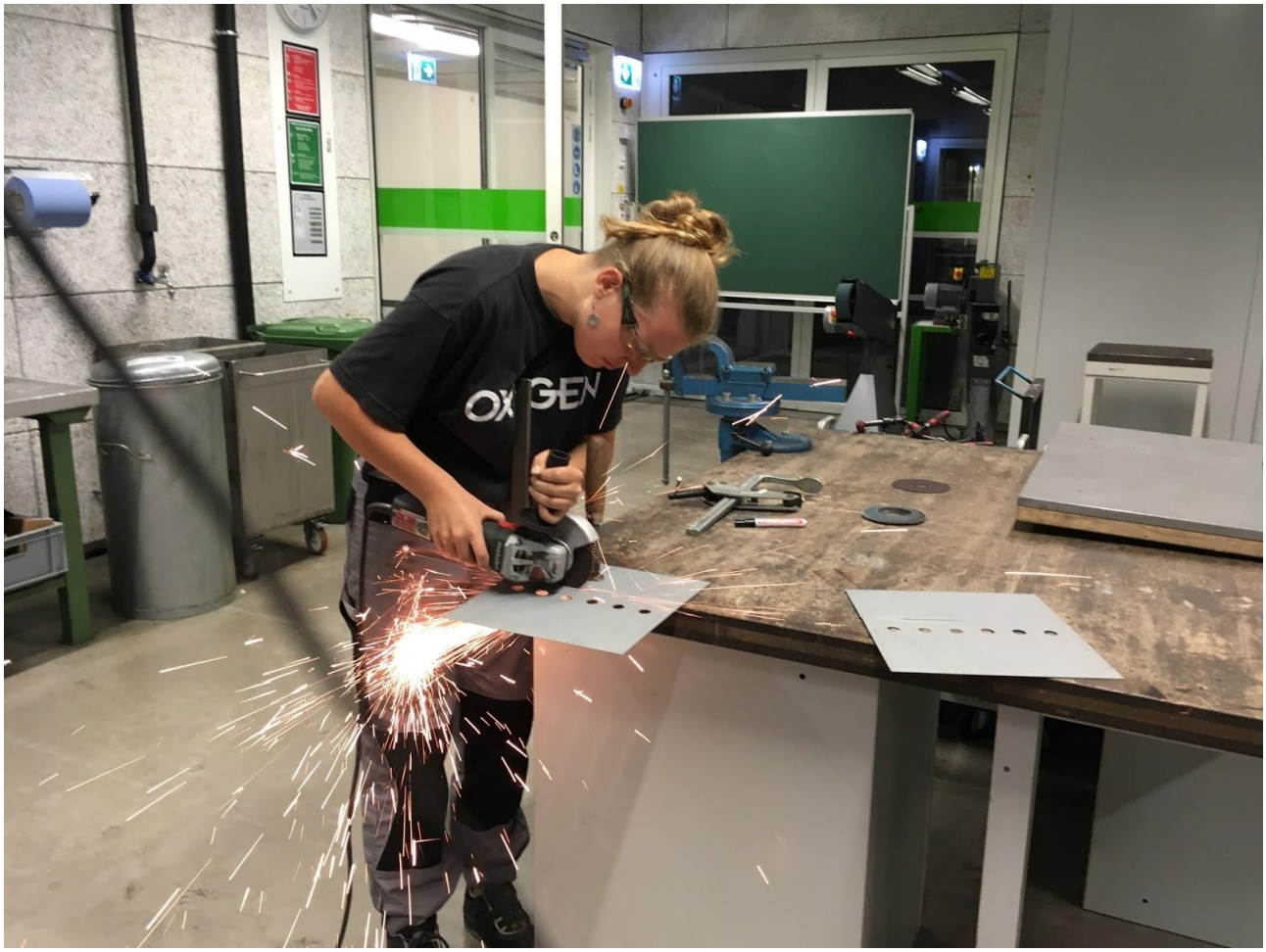

SKILLED-TRAINING FOR UNIVERSITY STUDENTS

TRAINING PROGRAMMES REPORT

● WORK PACKAGE

T2 - Innovation and Quality in Dual Education

● DELIVERABLE

D2.4.1 Training programmes reports

● AUTHOR

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1 SUMMARY

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INTRODUCTION

The design and crafts linking Bachelor programme “Manual & Material Culture” at the New Design University (NDU) in St. Pölten aims to prepare students for their own independence in design or crafts, leading positions in medium-sized companies or design offices. Two additional practical courses are offered as part of the course of study (metal and wood), which, however, cannot replace sound teaching for persons without corresponding practical training. The course "Skilled training for university students", developed in collaboration with cooperation partners, is designed as a consecutive model to enable students to complete a skilled worker qualification, which is not possible within the framework of the previous metal course of the Bachelor programme.

The pilot model was developed in the second half of 2019 and implemented within the framework of fourteen theory and 18 practice units between March and August 2020.

The free course should initially end between 29 June and 3 July 2020 with the final apprenticeship examination of the participants. Due to the Covid-19 pandemic, the NDU teaching activities were phased out in 2020 for distance or hybrid learning. Due to the pandemic, the final apprenticeship examination had to be postponed three times and finally took place in July 2021.

The pilot model was evaluated by means of two questionnaires and a final focus group discussion. The results of the evaluation (see chapter 6) particularly showed the relevance of the positioning of the skilled worker training in the Bachelor programme as well as a theoretical as well as practical deepening in the form of a mandatory company internship and optional intensive training in preparation for the final apprenticeship examination.

The skilled training shall be revised in accordance with the learnings (see chapter 7) and implemented as soon as possible. Furthermore, a corresponding skilled training is planned for the wood sector.

The combination of university studies and apprenticeship certification contributes to the quality and attractiveness of dual education as well as to the New Design University and the Bachelor programme “Manual & Material Culture”.

EXPERTS INVOLVED

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2 BACKGROUND

Austria is constituted by nine Regions, which have a certain level of autonomy. In view of the vocational education system, the federal government is main responsible.

The success of the dual system is the result of a process involving many institutions and bodies at different levels. At the federal level, there are the Ministry for Digital and Economic Affairs (BMDW) as well as the Ministry for Education, Science and Research (BMBWF). Latter defines the curriculum and partially finance the vocational schools. Each region has an Apprenticeship Office, placed at the Regional Economic Chamber (WKO), but subordinate to the Federal Ministry of Economy (BMDW).

Regional governments provide the financial resources for building and maintaining the vocational schools, for purchasing equipment, machinery and teaching materials and (together with the Federal Government) co-fund the salaries of teachers and trainers. The participation of companies and workers in the dual system is provided through several bodies.

At local level, enterprises hire apprentices. The on-the-job training is delivered through authorised trainers or instructors. Vocational schools provide general and theoretical training as well as some practical training.

Before they can hire trainees, the enterprises have to show they meet the legal requirements, in terms of suitable machinery and equipment, as well as of the skills of the trainers or instructors providing the on-the-job training. The trainer can be the entrepreneur him- or herself or another employee appointed by him or her. Trainers are required to have a professional expertise in the trade, or in a similar one, and to have passed the initial training instructor examination.

Enterprises can choose to train apprentices within the framework of training alliances with other companies as well. Since 2009, it is possible to carry out the apprenticeship through a supra-company training model (ÜBA), if a student is not able to find a placement in a company.

Beyond the on-the-job training, the trainees have to attend a vocational school for one day or a day-and-a-half per week, i.e. for 20% of the time. The organisation of the learning at the vocational school can also be blocked, e.g. continuously for eight weeks per year. Curricula of vocational schools contain mainly basic knowledge and skills related to the chosen occupation. Though the curricula are defined at federal level, the schools are allowed to have a certain degree of autonomy.

The apprenticeship period ends with a leaving (practical as well as theoretical) examination, which verifies that the trainee has properly acquired the required skills.

The Austrian dual education system is primary oriented at youngsters. So far, most existing educational and training offers beside classic dual education and training are addressed to people with pertinent professional practice or unemployed people with at most second level education. There are hardly offers for adults with higher educational background to learn a trade on second-chance education. Among other things, this gap should be closed by the developed training format.

3 GOAL

The Bachelor programme “Manual & Material Culture” at New Design University (NDU) in St. Pölten is aimed both at persons with apprenticeship certificate as well as high school diploma. The programme links product design with craft, conveys tools for professional design work to apprenticeship graduates as well as conveys well-founded wood and metal working competencies to graduates as and leavers of high school or university within additional courses. Among other things, students should be prepared for their own independence in design or craft, leading positions in medium-sized companies or design offices.

However, the additional courses within the Bachelor programme can’t replace a sound apprenticeship for persons without appropriate practical training. The skilled training for university students, which is introduced in the following sections, is designed as a consecutive model to enable students to obtain a certificate as skilled workers that is not possible within the framework of the additional metal course.

The developed training format aims at a simultaneous conclusion of the bachelor’s degree and the metalworking apprenticeship.

This should enable students to independently produce their own projects after completion and to be able to contribute their professional skills more fruitfully to their professional activities through the additional skilled worker training.

Furthermore, the format strengthens the quality and attractiveness of dual education to the public by combining university studies and apprenticeship.

4 DESCRIPTION OF THE PROGRAMME

The training format „Skilled training for university students” was developed in collaboration with a working group, designated as “community of practice”, consisting of cooperation partners, at the New Design University in the second half of 2019 and implemented in collaboration with the community of practice-member Pascal Ernst, who also leads the metal course of the Bachelor programme “Manual & Material Culture”, between March 2020 and January 2021 as pilot model for students as well as alumni of the Bachelor programme. The evaluation was conducted while as well as after the testing phase.

4.1 REQUIREMENTS

The pilot model was free of charge and addressed to students as well as graduates of the Bachelor programme "Manual & Material Culture" and thus, according to the requirements for the degree programme, to persons with a high school exam or/and an apprenticeship qualification.

4.2 CONTENT AND STRUCTURE

Aim of the skilled training for university students is to teach students professional and social skills as well as self-learning skills.

The specialist competences are oriented according to the Metal Technology Training Regulations [1] and include accordingly (condensed) content on integrated energy production, glass and glass components, metal technology project practice, Steel construction/metal construction - basics (including strength theory), materials technology (including material testing), building physics and fire protection, locks and lock types, railings, grids and grates as well as facades, glass structures and roofs.

[1] 148. Order of the of the Federal Minister for Economics, Family and Youth about the vocational training in the profession of metal technology (Metalltechnik-Ausbildungsordnung), https://www.ris.bka.gv.at/.

An increase of social skills is to be realized by different social forms of working groups. Within the scope of the skilled workers training, it should be worked in small groups as well as individually.

The documentation and reflection of individual training contents and work processes within the framework of an individual, freely configurable portfolio is intended to support students in strengthening their self-learning skills.

The skilled training ends with an apprenticeship certificate in Metal Engineering / Steel Construction Engineering.

In the development process for the future training format within the Bachelor programme "Manual & Material Culture", a total time frame of 256 hours (80 hours theory, 176 hours practice units) during the diploma thesis semesters (5./6.) was proposed.

Seminar Content	**Hours / Modules**
Theory	80 hours
Practice	176 hours
Total	256 hours

The training format was tested in a pilot model between March and August 2020 in condensed form (see chapter 5) and then evaluated. The following sections focus on the implementation and evaluation of the pilot model.

5 IMPLEMENTATION

5.1 ACTORS

The pilot model was developed in the second half of 2019 and implemented in the summer term of 2020. In both the development and implementation process, first, the NDU main team of the DuALPlus project, Stefan Moritsch and Julia Pintsuk-Christof, was involved; second, the community of practice, who was integrated in current project processes in general, consisting of six master crafts(wo)men and/or designers in metal work, smithery, orthopaedic shoemaking, ceramics and jewellery art. Among them, the metal worker Pascal Ernst should be specially mentioned. He already leads the metal course of the Bachelor programme "Manual & Material Culture" and thus took charge of the pilot model.

Not at least, the ten participating students respectively alumni of the Bachelor programme "Manual & Material Culture" among to the actors of the pilot model as well. They comprise of four women and six men between 23 and 38 years from Austria (seven) and Germany (three). Seven people have completed the high school with diploma, two have a craft master certification and a high school diploma, one person has an apprenticeship certification and a high school diploma. Six of the ten participants already have one or more vocational trainings as part of an apprenticeship, college and/or higher vocational school (high school diploma) in the fields of construction technology, interior design and furniture construction, agriculture, mechatronics, product design, carpentry and/or technical drawing.

5.2 CONDITIONS

Prior to the concrete implementation of the pilot model, a clarification of formal conditions was required. This included reconciling of content issues with the rectorate and the management board of the New Design University, organisational and legal issues as well as financial, human and spatial resources.

The pilot model was designed for a minimum of two and a maximum of ten participants. For the theory units, premises of the New Design University, for the practice units workshops of the WIFI Lower Austria were provided, which are located in the same building. The WIFI is an education and training institution, which, like the New Design University, belongs to the Lower Austrian Chamber of Commerce.

5.3 IMPLEMENTATION PROCESS

For the pilot model, fourteen theory and 18 practice units of five to eight hours were planned between March and June 2020. The free course should end between 29 June and 3 July 2020 with the final apprenticeship examination of the participants.

Participation in the pilot model was free of charge; the ten participants were recruited via the head of the academic section.

Due to the Covid-19-pandemic, the NDU teaching activities were phased out in 2020 for distance or hybrid learning. This situation also required greater flexibility and commitment from the leader and participants of the pilot model. For example, the theoretical content had to be learned largely in self-study. Nevertheless, the timetable of the theoretical and practical units was largely adhered to; the latter took place over the summer of 2020 and were completed at the beginning of August.

Due to the pandemic, however, the final apprenticeship examination had to be postponed three times and took place in July 2021.

6 EVALUATION

6.1 EVALUATION PROCESS

The evaluation of the pilot model "Skilled training for university students" was conducted between February and August 2020.

After a kick-off meeting with the head of the academic section, trainer and students respectively alumni, a questionnaire was sent out to all participants before the start of the course, primarily to determine their motivation for participating and their expectations of the course.

A second questionnaire was sent out towards the end of the pilot model, at the beginning of July 2020, to the individual participants, in order to assess their satisfaction with the course.

Following the completion of the pilot model at the beginning of August 2020, experiences, perspectives and recommendations were discussed with the participants and the trainer within a focus group.

The central results will be outlined below.

6.2 RESULTS

6.2.1 MOTIVATION TO PARTICIPATE

Six of the ten participants have already received one or more vocational trainings in technical, manual fields or in the field of design.

The decision to participate in the pilot model "Skilled training for university students" in addition or after the Bachelor programme "Manual & Material Culture" was primarily based on the desire to expand or deepen existing competencies.

> „Da ich den Metallkurs vier Semester absolviert habe und ein Lehrabschluss in Metall meine Kenntnisse stärkt."
>
> ["Because I participated in the metal course for four semesters and an apprenticeship certificate in metal strengthens my competencies."]

The stronger link between theory and practice also promises better opportunities on the labour market.

> „[…] Da ich eine spätere Selbstständigkeit im Möbel & Prototypenbau anstrebe, wird dies durch die Facharbeiterausbildung deutlich gefördert. Nur wenn man das Handwerk versteht, kann passend geplant werden."
>
> ["[...] Because I am aiming for a later independence in furniture & prototype construction, this is clearly promoted by the skilled training. Only if you understand the craft, you can plan appropriately."]

A ranking of different potential motives showed the following priorities:

- Expansion of craft skills
- Diversity of professional opportunities
- Establishment of own company with practical craftsmanship (execution of both design and production)
- Professional activity in the craft trade
- Special professional interest
- Completion of the final apprenticeship examination
- Admission to craft master classes/craft master examination

- Establishment of an own company with a theoretical reference to craftsmanship (competence in craftsmanship but limited to design work)

6.2.2 EXPECTATIONS OF THE PILOT MODEL

The participants primarly expected an extensive training in metal work of the skilled training („So viel lernen wie möglich“; “Learning as much as possible“) as well as to gain practical experience, to be promoted with regard to their self-realization and to be prepared for the future independence as well as to be able to successfully complete the course with the final apprenticeship examination.

With regard to professional skills, the participants primarily expected to learn specific techniques (e.g., welding, turning, and milling). Social competencies are to be strengthened by an extensive balance of individual and group work, self-learning competencies by developing work pieces and space for experimentation and reflection.

Retrospectively, the expectations of the participants have mostly been met. Thus, the majority described the acquired professional skills as essential and practice-oriented. Some of the participants would have liked to have a little more in-depth knowledge in order to feel better prepared for the final apprenticeship examination.

The promotion of social competence was perceived as successful due to the positive working climate, the open exchange and discussion possibilities as well as balance between individual and group work.

The expectations regarding the promotion of self-learning competence were fulfilled largely also due to the possibility to develop in practice and the independent elaboration of theoretical contents.

From the point of view of the trainer, several participants had difficulties in independently learning theoretical contents, which is why he provided further theoretical material for the final apprenticeship examination.

6.2.3 GOALS BEFORE THE START OF THE PILOT MODEL

The majority of participants stated in the first questionnaire that they pursue a career entry or concrete professional plans, such as to become independent with the planning and implementation of projects or to work in an "innovative creative" craft company and/or design office after completion of the pilot model. After successful completion of their apprenticeship, three people plan to complete the craft master in metalworking, a further university programme or further craft training. One person is already self-employed and would like to use the additional skills acquired within the framework of his or her company.

6.2.4 SATISFACTION WITH THE PILOT MODEL

The second questionnaire and the focus group discussion focused primarily on the experiences and perspectives of the participants after completing the theoretical and practical units of the pilot model.

The course met retrospectively with overwhelming satisfaction, although constructive criticism was voiced, which should be taken into account when revising the skilled training.

Particularly positive was the open atmosphere in the course, the work in the workshop, the opportunity to contribute to the design, the strong practical relevance and the opportunity for joint discussion.

Potential for improvement, however, was mentioned above all with regard to the temporal resources for theory and practice.

> „Es ist ein enges Zeitkorsett mit sehr vielen praktischen und theoretischen Inhalten zu bewältigen. Die Vorzüge der gebotenen Vielfalt überwiegen dennoch.“
>
> [“It is a tight time corset with many practical and theoretical contents to cope with. The advantages of the variety offered still predominate.”]

Especially for the participating students, the completion of the course parallel to their diploma thesis was a challenge. There were also limited time and space resources due to the Covid-19-situation.

Furthermore, the participants would have liked a stronger theoretical input in the form of textbooks, formulas or guides during the course. The lack of a structure in the curriculum was also mentioned by individual persons.

6.2.5 ACHIEVED GOALS

Despite restrictions due to the Covid-19-pandemic, the pilot model largely contributed to achieving the defined goals. Thus, all participants described their previous competences as generally improved by the scope of “offered process-processing techniques in connection with industry-fair professional competence”. The

expansion of professional knowledge in general and skills in crafts in particular as well as the stronger connection of theory and practice compared to the Bachelor programme "Manual & Material Culture" has also led to greater self-confidence with regard to the implementation of own projects. However, several participants doubted whether the competences learned in the pilot model were sufficient for a positive final apprenticeship examination.

> „Erweiterung der Kompetenzen findet klar statt. Allerdings steht zur Frage ob so ein Lehrabschluss bestanden werden kann."
>
> ["There is a clear extension of competences, but the question is whether such a final apprenticeship examination can be passed."]

There are even greater doubts about the joining of a craft master course, for which significantly more practice units are required.

> „Der Facharbeiterkurs ist ein guter Einstieg, aber mir persönlich fehlt einfach die Praxis um mir den Meisterkurs zu zutrauen."
>
> ["The skilled training is a good start, but I personally lack the practice to trust me in doing the craft master course."]

More practice would also be needed for a job in the craft trades, so the pilot model focused more on the teaching of basic knowledge. However, the participants dare to build on the acquired knowledge and also use it in companies with more theoretical craftsmanship (emphasis on design work). This has also increased the variety of career opportunities and job market opportunities.

6.2.6 FUTURE PROSPECTS OF THE PARTICIPANTS

The majority of participants would like to use acquired skills in previous and future jobs and deepen them with more practical experience. Several of them want to go directly into the profession and sooner or later set up their own company. Three participants would like to join other trainings.

6.2.7 FINAL APPRENTICESHIP EXAMINATION

The final apprenticeship examination took place in July 2021, to which three of the participants took part, one with distinction. The third person successfully completed the test in September 2021.

7 LESSONS LEARNED

From the evaluation of the pilot model "Skilled training for university students", the following learnings can be derived, which would have to be taken into account in a potential course revision:

- **Skilled training between fourth and fifth semester**: The participating students rated the completion of the skilled training as challenging in parallel to their diploma theses in the sixth semester. As a result, we recommend moving the 80-hour theory units and 176-hour practice units to the summer break between the fourth and fifth semester (e.g., theory on Friday evenings, four hours each; practice all day on Saturdays, eight hours each).

- **Mandatory company internship between second and fourth semester**: The participants were able to fundamentally expand their competences within the framework of the pilot model, but expressed doubts about sufficient preparation for the final apprenticeship examination and practical work in the craft trade. In order to provide future students with extensive practical competence, we recommend a mandatory internship of approx. 160 hours in a metalworking company between the second and fourth semester, but at the latest before the final apprenticeship examination.
The internship company is chosen by the students themselves. This enterprise must not have a vocational training examination, but must be relevant with regard to the metal worker field and be open throughout the full period of the internship. Students must document their work in weekly internship reports.

- **Optional intensive training**: In order to prepare the students specifically for the final apprenticeship examination, we recommend an optional intensive training of 40 hours after completion of the theory and practice units. Trainers and students can decide together whether there is a need for it.

Seminar Content	**Hours / Modules**
Theory	80 hours
Practice	176 hours
Intensive Training	40 hours

Internship	160 hours
Total	**456 hours**

The evaluation of the skilled training has shown that such a model can contribute fundamentally to the promotion of dual training at the tertiary level as well as to the connection of design and craftsmanship. Since it is not possible to integrate this model into the curriculum, guidelines have been developed that, with explicitly interest and initiative of themselves, help the students with the individual preparations for the final apprenticeship examination in metal and the wood sector. These guidelines provide information on, for example, what can be credited from the craft modules in the course of the bachelor programme and how many practical hours are still required to take the exam. It is also planned to provide the students with the necessary time for their studies so that they can collect practical time for the final apprenticeship examination at the same time.

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