ibw-research brief

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Modular Apprenticeship for the Wood Industry

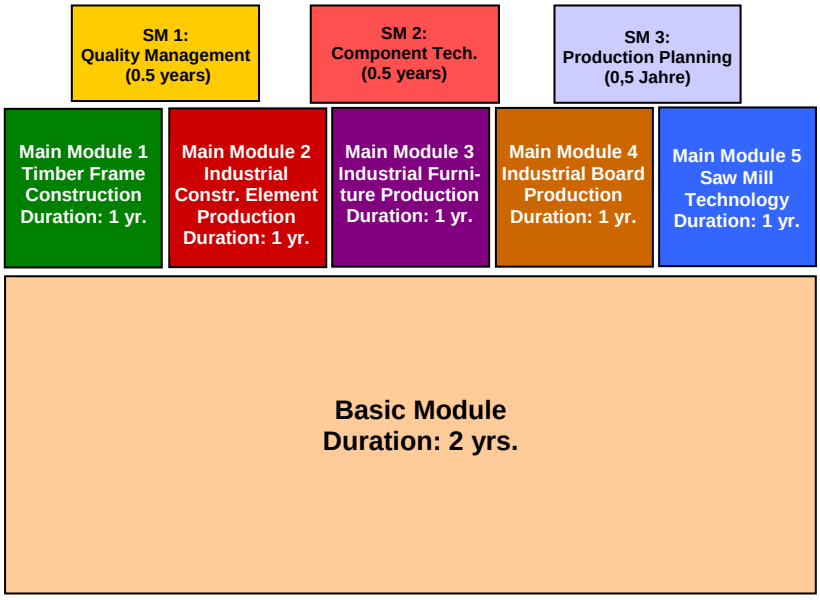
Expert Survey for the Creation of a Modular Apprenticeship

The desire to increase flexibility in the design of the educational program, to address the widely expressed requests for apprenticeships of the companies, and the related expansion of potential companies for providing apprenticeship training were the main reasons that the Fachverband der Holzindustrie Österreichs (Association of the Austrian Wood Industries) developed the concept of the modular apprenticeship "Industrial Wood Technology". In November 2006, the Institut für Bildungsforschung der Wirtschaft (ibw – Institute for Research on Qualifications and Training of the Austrian Economy) was commissioned to survey company representatives in the construction, furniture, board and saw mill sectors regarding their opinion of the proposed apprenticeship. The results: Both the modular design as well as the contents of the individual modules were given predominately positive evaluations by the experts from the various sectors. A majority of the companies, including many who are currently not involved with apprenticeship training, expressed their readiness to train apprentices in the proposed modular apprenticeship. Establishing this vocation could thus close an existing demand gap.

1. Starting Position

Dual training enjoys high regard in Austria. In order to maintain interest in apprenticeships in the future, attractive educational offers are needed. The emerging demographic development in which the number of 15 year-old youth, and thus those who might potentially begin an apprenticeship in the coming years, are successively decreasing making such offers even more necessary. The competition for the "brightest heads" also requires the sectors and companies to position themselves as attractive employers. Only so will it be possible to ensure that the demand for skilled workers is covered in the future as well. In consideration of these circumstances the Association of the Austrian Wood Industries proposed a new apprenticeship that takes the entire wood value chain into account. This apprenticeship adopts the module concept that was anchored in the Vocational Training Act in January 2006. It consists of a two-year basic module (GM), five one-year main modules (HM) as well as three half-year special modules (SM) (see illustration 1 and page 4).

Ill. 1: Proposed Modular Apprenticeship "Industrial Wood Technology"



2. Study Design

Under commission of the wood industry, the ibw carried out a written questionnaire survey between November 2006 and January 2007 at 175 companies in the wood industry in which representatives from the various sectors were questioned regarding their opinion of the proposed modules, their duration, and their content. The goal of this survey was to obtain feedback, suggestions and requests for changes to serve as a basis for the client to determine further steps of action.

3. Main Results

The **main results** of the survey can be **summarized** as follows:

General

- A total of 43 companies participated in the survey. The **return rate** of 24.6%, which is **very high** for questionnaire surveys, is evidence of the high degree of interest in this plan on the part of the wood industry.
- Overall, the **feedback** received for the proposed modular apprenticeship was predominately positive. The criticism raised was virtually evenly spread among each sector of the wood industry (construction, furniture, board and saw mill).

Time Frame

- The vast majority (84%) believe the **time frame of the modules** – two-year basic module, one-year main module and half-year special module – to be appropriate. Individual requests were made to shorten the basic module (to one and a half years) and to extend the main module (also to one and a half years).

Basic Module

- The majority of the survey participants (56%) agreed with the proposed **technically related vocational education of the basic module** (see page 4).
- Further requests were also made to impart the following knowledge and skills (see illustration 2):

Ill. 2: Suggestions for Additional Vocational Education Content in the GM

- Languages, e.g. Italian, Slavic languages, English
- Fundamentals in communication
- Work safety and accident prevention, first aid
- Environmental protection
- Work preparation
- Fundamentals of numerically controlled programming
- Constructional wood preservation
- Knowledge of other materials, e.g. glass
- Fundamentals of mechanical engineering, mechanical elements
- Fundamentals of "continual improvement programs" (e.g. Kaizen)
- Sorting of round timber according to quality, yield, value optimization
- Fundamentals of sawing and planing technology, sorting regulations, drying and gluing technology
- Handling and fundamentals of wood production tools (milling cutters, planes, saws, chippers)
- Wood craftsmanship
- Ability to evaluate the quality of different woods
- Organization of work
- Fundamentals of storage and organization of replacement parts

Main Module

- The majority of the experts surveyed (74%) believe the **educational focus of the main module** is adequate for the various sectors (Construction, Production of Building Elements etc., see page 4). Several company representatives also requested additional main modules (wood glue construction, furniture technology). There were also several requests to reduce the proposed number of modules by on the one hand combining two main modules due to their similar educational content (Construction and Production of Building Elements to Production of Wood Construction Products), and on the other hand by omitting a main module that is also covered elsewhere (Construction would be covered by Carpentry).
- 70% of the experts hold the **technically related vocational education of the basic module** (see page 4) for sufficient. It was suggested to include the following in the main modules (see illustration 3).

Ill. 3 Suggestions for Additional Educational Content for the HM

Main Module Construction
- Numerically controlled programming
- Demolition technology
- Bonding agents
- Gluing technology
- Logistics (manipulation and loading)
- Complex maintenance work
- Final installation of elements

Main Module Saw Mill Technology
- Cut calculation for band saw guides
- Classification of hard wood according to yield, quality, price, time
- Yield- and cross section calculation – cost calculation
- Detailed knowledge of wood drying
- Knowledge of storage and packing
- Knowledge of wood preservation
- Fundamentals and special knowledge of the main machines in the saw mill industry
- Knowledge of relevant norms and sorting regulations
- Knowledge of sharpness of special tools

Main Module Industrial Furniture Production

- Fundamentals in how a production, planning and control system functions

Main Module Industrial Production of Wood Construction Products
- Detailed knowledge of wood drying
- Knowledge of relevant norms and sorting regulations
- Fundamentals and special knowledge of machine and plant technology in the areas of planing, sanding and pressing
- Detailed knowledge of adhesive and glue technology
- Knowledge of sharpness of special tools
- Static, strength of materials, relevant norms

General
- Fundamentals of management
- Fundamentals of work preparation
- Work safety and accident prevention
- Communication/negotiation/moderation
- Individual work techniques
- Fundamental knowledge of production logistics
- Fundamental knowledge of maintenance and maintenance planning
- Fundamental knowledge of quality control

Special Modules

- A majority of the participants surveyed (81%) believe there is a **need for the proposed exemplary special modules** (see page 4). The integration of the respective educational content therefore appears to be necessary.
- 70% of the industry representatives welcome the **educational focus of the special modules** (Quality Management etc. see page 4). Requests were made for additional special modules in the areas of composites, storage management, process management as well as residual wood recycling.
- Approximately half of those surveyed (51%) evaluated the **technically related vocational education of the special modules** (see page 4) as being sufficient. Suggestions for additional content were made for all three special modules.
- A majority of the company representatives surveyed (74%) would **train their apprentices in the special modules**, above all in the special module Quality Control. Once again this illustrates the need for the proposed educational content.

Ill. 4: Suggestions for Changes in the Educational Focus of the SM

New Special Module: Composites
- Knowledge of how to process plastics and board materials
- Knowledge of the manufacture of plastic/wood joints
- Knowledge of laboratory techniques for examining various products
- Introduction to processing techniques for the manufacture of plastic/wood
- Integration, work in production processes
- Knowledge of work safety in processing

New Special Module: Storage Logistics/Storage Management
- Receipt, inspection and storage of goods
- Use and maintenance of technical equipment and devices
- The ability to determine the necessary storage conditions based on the properties of the goods to be stored
- Maintain and monitor inventory, and initiate necessary measures if needed
- Preparation of goods for shipping
- Assist in the creation of storage logistics concepts
- Use of industry standard information and communication technology
- Completion and processing of profession relevant forms, and correspondence
- Perform administrative work with the help of company information and communication systems
- Assist with company accounting and cost calculation
- Create, maintain and evaluate statistics, data and files

- **Production Planning** with the emphasis on "processes for need-related production"
- **Work in Organizations** – team work, management
- **Residual Wood Recycling** (incl. biomass fuel)

Positive Response

- The positive feedback for the proposed modular apprenticeship also manifests itself in the expressed **intention to train apprentices in this profession**. 85% of the companies would train apprentices in the apprenticeship "Industrial Wood Technology" to an extent in addition to the existing apprenticeships and to an extent instead of these apprenticeships.
- Companies that currently do not train or have never provided training for apprentices would, should the modular apprenticeship be implemented, **once again, and respectively for the first time, engage in apprenticeship training**. 92% of these companies would train apprentices in the proposed apprenticeship. The lack of suitable apprenticeship offers, which is often given as the reason for not training, would thus be eliminated.
- 70% of the companies that do not provide apprentice training would also **provide training in the special modules**. This also mirrors the wide acceptance of this apprenticeship concept, since special modules are in principal what constitute a modular apprenticeship.

4. Summary

The main results suggest that the industry is greatly interested in this apprenticeship. It is therefore advisable to examine the changes suggested by the experts surveyed and to **adapt** the current **module proposal** appropriately. In a further step, the trade association should take the **necessary steps to implement this apprenticeship**.

Suggestion for the Modular Apprenticeship "Industrial Wood Technology" – General Contents of the ***vocational education***

Basic Module

- Knowledge of logging, wood types, their properties, processing and treatment possibilities as well as wood storage and drying
- Evaluation of wood quality
- Knowledge of the properties, processing and treatment possibilities of further materials such as metal and plastic as well as knowledge of auxiliary materials
- Fundamentals of electrical engineering as well as control and regulatory technology
- Creation and use of technical documents such as from sketches, drawings, user manuals etc.
- Use of profession relevant measuring devices
- Use and maintenance of tools, devices, machines and production equipment
- Use and operation of conveyor systems
- Manual and machine processing and treatment of wood and wood materials
- Manual and machine processing and treatment of metals and plastics
- Assist in monitoring and controlling of production processes for the industrial manufacture of wood products
- Treatment of surfaces
- Assist in packaging and storing of wood products
- Use of company specific hard and software

H1 Construction

- Installation, equipping and adjustment of production equipment
- Use, monitor and control of production processes for the industrial manufacture of construction elements
- Conduct simple maintenance work on the production machines and equipment
- Manufacture of surfaces
- Pre-installation and assembly of elements
- Packaging and storage of wood products
- Conduct discussions with colleagues and suppliers while observing proper professional conduct

H2 Production of Industrial Building Elements

- Installation, equipping and adjustment of production plants
- Use, monitor and control of production processes for the industrial manufacture of building elements from wood, metals and plastics
- Conduct simple maintenance work on the production machines and equipment
- Manufacture and finishing of surfaces
- Pre-installation and assembly of construction elements such as windows and doors
- Packaging and storage of wood products
- Conduct discussions with colleagues and suppliers while observing proper professional conduct

H3 Industrial Furniture Production

- Installation, equipping and adjustment of production plants
- Use, monitor and control of production processes for the industrial manufacture of furniture parts of wood also using metals and plastics
- Conduct simple maintenance work on the production machines and equipment
- Manufacture and finishing of surfaces
- Pre-installation and assembly of furniture parts and furniture
- Packaging and storage of wood products
- Conduct discussions with colleagues and suppliers while observing proper professional conduct

H4 Industrial Board Production

- Installation, equipping and adjustment of production plants
- Monitoring and control of production processes for the industrial manufacture of wood fiber and particle boards, veneer plywood as well as from single and multi-layer solid wood boards also using other tool and auxiliary materials
- Conduct simple maintenance work on the production machines and equipment
- Manufacture of surfaces
- Packaging and storage of wood products
- Conduct discussions with colleagues and suppliers while observing proper professional conduct

H5 Saw Mill Technology

- Installation, equipping and adjustment of production equipment
- Monitoring and control of production processes for the industrial manufacture and further processing of lumber
- Conduct simple maintenance work on the production machines and equipment
- Manufacture of surfaces and performance of wood preservation measures
- Conduct discussions with colleagues and suppliers while observing proper professional conduct

S1 Quality Management

- Use and implementation of QM tools

S2 Building Element Technology (only for HM 2)

- Knowledge of profession relevant norms and regulations for building elements
- Installation of building elements
- Use of project management tools, construction schedules etc. for carrying out projects
- Advising and consulting customers

S3 Production Planning

- Performance of production process optimization
- Use of production planning tools

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