

## **DEVELOPMENT AND IMPLEMENTATION OF A CONCEPT FOR DEMAND- AND BENEFIT-ORIENTED DEVELOPMENT OF SKILLS AND ABILITIES IN THE REORGANIZATION AND OPTIMIZATION OF PROCESSES**

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### **ABSTRACT:**

*Wood processing industry is very important for the economy of Bosnia and Herzegovina. There are more than 430 companies which produce furniture and products of wood, cork, straw and plaiting materials. These companies employ about 6,600 people and generate income of approximately BAM 509 million, of which about 59% refers to exports. [Source: OECD] At the same time, this sector suffers from the fact that many professionals trained in the companies leave the country. This is particularly painful for kmU due to its individual organisation and limited human resources. And it leads to a concrete loss of know-how. From the government's point of view, there is currently no short-term answer to the associated problems.*

*While qualified and practice-oriented initial and further training courses are available in the field of mechanical manufacturing (e.g. WMTA Banja Luka), the young people from the engineering science faculties (cadres for middle management) usually have little practical experience, skills and abilities. Remaining cadres often base their knowledge on educational findings from mass production or from learned, improvised action. Newly recruited graduates must be trained over a longer period of time. Further training takes place in-house and thus preserves existing knowledge (at best), but does not enable future-oriented thinking, while global competition on export markets is constantly intensifying.*

*Against this background - adapted to the Prilika Plus model of the Bosnian government in cooperation with the Swiss Agency for International Cooperation (SDC) - an innovative further training programme for middle management was developed and implemented (LSDT - Leadership and Skills Development Training). This modular programme enables the acquisition of the latest knowledge, skills and abilities through the application of concrete entrepreneurial case studies within the framework of an internationally recognised CAS training, while at the same time developing team-oriented leadership and processing skills through coached group work. The further training lasts 1 year and is carried out in 6 blocks.*

*The feedback from more than 45 participants so far has been consistently positive. Critically was noted that a) the costs are high, b) the expenditure of time is often difficult to reconcile with professional and family reality, c) a more modular use of content would also be desirable, and d) the implementation of the offer by local service providers is more difficult.*

*The use of digitised learning offers is regarded as a cost-reducing, flexibly usable concept that can be adapted to the living conditions of the learner. Supported by European Union and GIZ (German Development Agency - Deutsche Gesellschaft für Internationale Zusammenarbeit) through EU ProLocal programme was developed a first E-training in Wood Industry on Balkan. The E-training module „Optimization of Production and Logistics” is based on the similar LSdT-module and is relevant to wood-processing companies, in which the focus is on optimization of the production and analysis of processes, transportation, materials and workers within the same. The e-training module is completed in 5 weeks and leads to immediate results, as it is conducted in cooperation with the participating companies and with a special focus on sustainability. The results obtained during the prototype testing exceeded all expectations.*

*The concepts, procedures and results described above will be presented in this paper. In addition, an outlook on current developments is given.*

## **Introduction**

Wood processing industry is very important for the economy of Bosnia and Herzegovina. There are more than 430 companies which produce furniture and products of wood, cork, straw and plaiting materials. These companies employ about 6,600 people and generate income of approximately BAM 509 million, of which about 59% refers to exports. [1]

At the same time, this sector suffers from the fact that many professionals trained in the companies leave the country. This is particularly painful for kmU due to its individual organisation and limited human resources. And it leads to a concrete loss of know-how. From the government's point of view, there is currently no short-term answer to the associated problems.

While qualified and practice-oriented initial and further training courses are available in the field of mechanical manufacturing (e.g. WMTA Banja Luka), the young people from the engineering science faculties (cadres for middle management) usually have only little practical experience, skills and abilities. Remaining cadres often base their knowledge on educational findings from mass production or from learned, improvised action. Newly recruited graduates must be trained over a longer period of time. Further training takes place in-house and thus preserves existing knowledge (at best), but does not enable future-oriented thinking, while global competition on export markets is constantly intensifying.

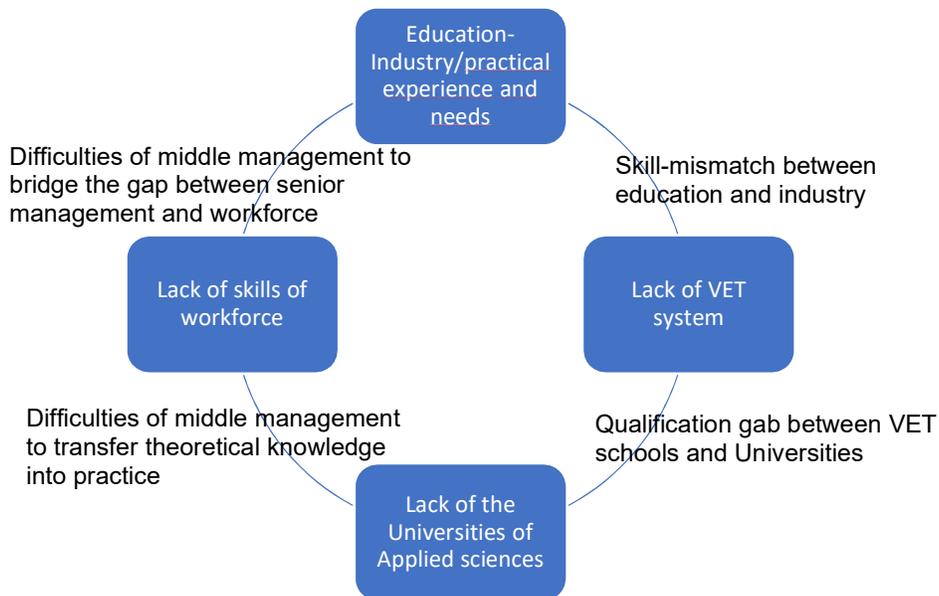
An additional challenge arises from the digitalization of all business processes. Why are we dealing with such a comprehensive trend? The industry makes the following statements. "... Our existing infrastructure will be created, operated, maintained and expanded with the means available to us - including digitisation. ... Digitisation and its possibilities for simplifying and accelerating business processes with a high need for communication is ... not a single task, but an opportunity and an obligation to work together and can only be solved jointly". [1] "... Data-based business models are changing the industrial sector. Real-time information about (all) operational components is loaded directly into the cloud and maintenance and diagnostics can be performed remotely. ... Digitization and IIoT have the potential to revolutionize the industrial sector. More and more functions and applications

in a factory floor are being digitized and can be precisely controlled and coordinated. At the same time, data is collected at the neuralgic points of a plant which not only helps to increase productivity but also to increase the cost and energy efficiency of an operation. ...” [2]

#### Human Ressources and Challenges

The most important problems and challenges according Human Ressources will be shown on picture 1.

The greatest understanding of training needs and their value has so far been found in export-oriented companies. This can be explained by the fact that these companies have knowledge about the competitive situation, they have to assert themselves (and successfully assert themselves) in a real global competition and they usually have good knowledge about the condition and working methods of their competitors. At the same time, they need well-trained personnel who are increasingly difficult to find due to fluctuation.



Pic. 1: Problems and challenges in Bosnian VET-System (Source: BUAS)

## **2. LSDP**

Against this background - adapted to the Prilika Plus model of the Bosnian government in cooperation with the Swiss Agency for International Cooperation (SDC) - an innovative further training programme

for middle management was developed and implemented (LSDT - Leadership and Skills Development Training).

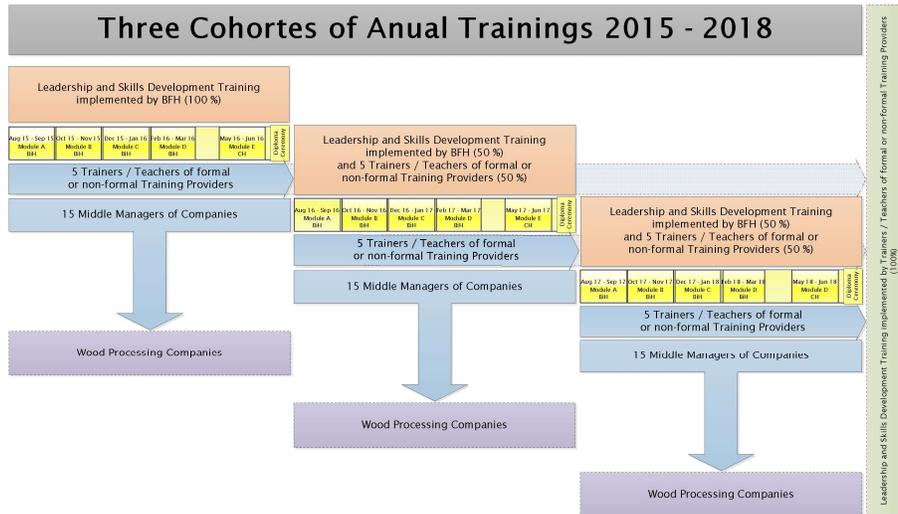
#### Challenges addressed by the LSDT



Pic. 2: Challenges of LSDT (Source: BUAS/BFH)

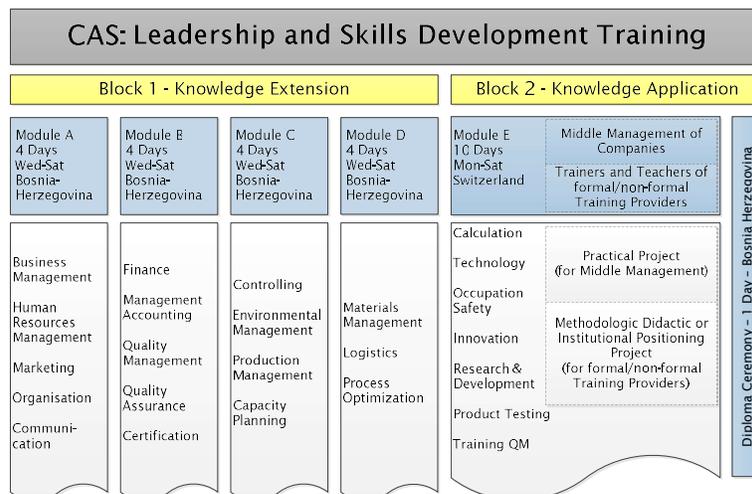
#### Structure of programme

The training programme (LSDP) was planned for 3 years. It includes:  
3 LSD Trainings for middle management  
3 LSD Trainings for local trainers / teachers in up to date methodologies and didactics

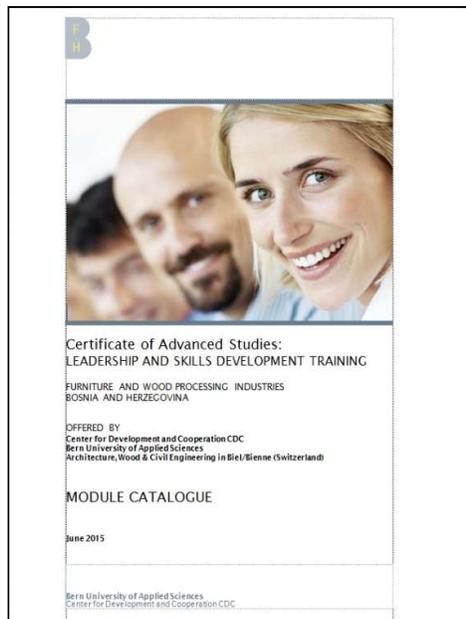


Pic. 3: Structure of LSDP (Source: BUAS)

Stepwise integrate local trainers / teachers in the implementation of the LSDT  
 Support non-formal and formal training providers / institutions in the introduction of long-term concepts for continuous upgrade and quality management



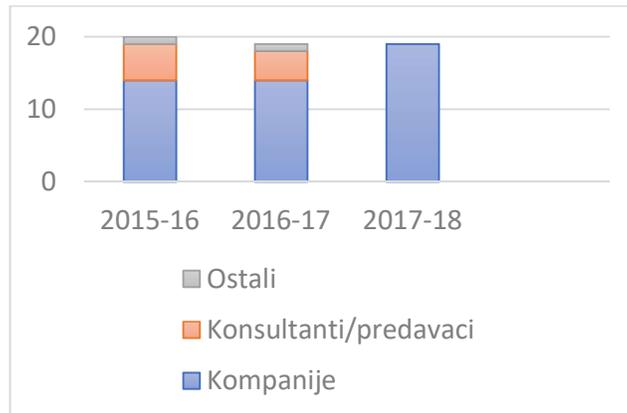
Pic. 4: Content of LSDT programme



Pic. 5: Certificate of Advanced Studies (Source: BUAS)

This modular programme enables the acquisition of the latest knowledge, skills and abilities through the application of concrete entrepreneurial case studies within the framework of an internationally recognised CAS training, while at the same time developing team-oriented leadership and processing skills through coached group work. The further training lasts 1 year and is carried out in 6 modules.

About 45 middle managers of furniture and wood processing companies directly benefit from the Leadership and Skills Development Training.



Pic. 6: Statistics of participants (BUAS)

16 small or medium sized furniture-/wood processing companies directly benefit from well-trained middle management staff and an improved VET-system. About 15 trainers of formal and non-formal training institutions / providers directly benefit from the Leadership and Skills Development Training.

### Feedback

The feedback from more than 45 participants so far has been consistently positive

- ▶ Gained skills applied to the daily work of participants:
  - Application of the LEAN management,
  - Organization of the production,
  - Distribution of workstations,
  - Standardization,
  - Quality control,
  - Implementation of the Kanban system,
  - Knowledge transfer methodology in consulting work
  
- ▶ All participants would recommend this training to the friends/colleagues:
  - Strong networking between companies
  - To CEO (Top manager) to improve the assignment between managers
  - To students to gain practical skills
  - To middle manager to gain the general perspective of leadership

Critically was noted, that

- a) the costs are very high,
- b) the expenditure of time is often difficult to reconcile with professional and family reality,
- c) a more modular use of content would also be desirable, and
- d) the implementation of the offer by local service providers is more difficult.

### Next steps and Lessons learned

The training was very successful and a further development of the training should take into account the next facts:

- Involve companies (beneficiaries) directly
- Minimize costs
- Increase and integrate flexibility
- Focus training on skills
- Achieve immediate benefit
- Focus on Sustainability

How to go on?

### 3. The new training approach (Digitalization in Continuing Education)

The use of digitised learning offers is increasingly regarded as a cost-reducing, flexibly usable concept that can be adapted to the learner's living and working conditions. E-learning refers to learning methods that take place digitally or online. "... Learning with digital media enables flexible further education, independent of place and time and at a self-determined pace. But it also requires discipline and initiative. ... ". [3]

In the meantime, a wide variety of implementations and methodological concepts exist, especially in the area of training. In continuing education, individual solutions are generally preferred, so that it becomes necessary to develop one's own solutions for non-typical continuing education offers. Today, one can build on a wealth of experience.

This form of learning also requires time and space: the participants must be available for the processing time and able to learn undisturbed. A further prerequisite for learning success is the quality of the content. Good e-learning is characterised in particular by a high degree of interactivity and multimedia. When selecting an e-learning offer, the following should therefore be taken into account:

- The learning objectives are clearly formulated and communicated in advance.
- The contents are understandable and clearly structured.
- The target group is clearly named and directly addressed.
- The maximum processing time per chapter is 1 hour. Online sections do not exceed 12 - 15 minutes.
- There are additional working materials, also available for download.

### Digital complements classroom seminars

While some learning content can be easily delivered digitally, other content works better in direct interaction with a coach or other learners. Blended learning offers particular advantages. Presence/dialogue and online phases alternate and complement each other.

For example, in "blended learning" participants first use e-learning to bring themselves up to the same level of knowledge, then apply what they have learned in practice and develop their skills together. A subsequent e-learning phase helps to transfer what has been learned into everyday life. This ensures that know-how is not only conveyed theoretically, but also applied practically: The participants acquire knowledge as well as new behaviours. [4]

## Process and demand approach

Web Based Training (WBT) is a special form of e-learning. If the WBT is moderated by an instructor/tutor, it is a moderated WBT (mWBT). [5]

WBT enables the learner to make his learning process more flexible in terms of space, time and content. In addition to the self-directed learning process, the WBT enables a stronger interactivity between learners and teachers as well as between learners than in classical mass events or in conventional distance learning. [6]

Supported by **European Union** and **GIZ** (German Development Agency - Deutsche Gesellschaft für Internationale Zusammenarbeit) through **EU ProLocal** programme was developed a first prototype of E-training in Wood Industry on Balkan. The E-training module „*Optimization of Production and Logistics*“ is based on the similar, successful LSDT-module and is relevant to wood-processing companies, in which the focus is on optimization of the production and analysis of processes, transportation, materials and workers within the same.

This combination made it possible to use trainers trained in LSDT as coaches in e-training and to agree individual case studies with the companies.

The aim of the training is to transfer knowledge for reorganization of production process, analyse material and information flow, and to adapt transport of materials within production using modern tools and production control to achieve optimal production and maximum efficiency.

### **E-Training "*Optimization of Production and Logistics*" (prototype)**

The training was carried out, focusing on training of middle management within manufacturing companies. The target is “For optimal organization of company’s processes, specific knowledge and skills are needed.”

Furniture production or multi variant production can always be improved. The world is vigilant and rapidly changing – development of new methods, technologies, equipment, principles are rapidly increasing, improving and evolving.

As the range of new opportunities for improvement are increasing disproportionate to it the compatibility of individual ideal solutions is decreasing. As we have wider range of choices means that we only have more choices to complicate our strategy. For the optimal organization of the company, specific knowledge and skills are needed to improve the production organization.

A particular challenge here is that SMEs are usually individually organised and managed. General knowledge is not sufficient for this. Tools that have been taught and learnt must be individually adapted to the specific needs of the company.

The training consists of three phases that ensure a quality and long-lasting transfer of knowledge and skills:

#### **1. Opening / The Seminar**

A F2F seminar is the introductory part of the training, where the focus is on understanding the subject we want to achieve through training, as well as presenting organization and training deadlines.

Participants and trainers gathered at a single location where presentations of materials were held and mutual acquaintance as well as exchange of contacts of participants were made.

## 2. Knowledge transfer

Knowledge transfer is completed through a web platform, which is the main location for all participants for the rest of the training. This phase is provided by virtual communication and usage of the web platform. Individual learning of materials on a predetermined calendar and online and group consultations have resulted in the maximum utilization of working hours and in achieving new theoretical knowledge.

## 3. Case study

After the acquired knowledge the training is not completed. In order to ensure long-term acquisition and retention of knowledge, practical part of the training was introduced. All participants had a certain time to work on a Case Study of their company using the knowledge and tools they learned during the previous phase, coached by qualified trainers.

The e-training module is completed in 5 weeks and leads to immediate results, as it is conducted in cooperation with the participating companies and with a special focus on sustainability. The results obtained during the prototype testing exceeded all expectations.

Once the participants conduct a Case study of their company and present the acquired solutions in company (and for management), thereby they obtain the *Certificate for analysis and realization of Optimization of Production and Logistics*.

In testing this type of training, which for the first time appeared in the wood industry in the Balkans, four companies in Bosnia and Herzegovina from different locations participated:

- LIGNUM d.o.o. (Mostar)
- ELGRAD d.o.o. (Teslić)
- FAGUS HAUS (Banja Luka)
- MEGA DRVO d.o.o. (Bijeljina)

## Feedback and results

All 15 participants showed interest in this type of training and have made very positive results in their businesses. By analysing their company, the participants recorded the current state of production, and using the acquired knowledge developed a strategy for the reorganization of the production of their companies.

All four companies have achieved 20-50% improvement in their production. Satisfied with the presentation of the results of their managers' analysis most of the companies, parallel to the training, started the implementation of reorganization activities in their manufacturing processes, which will bring them significant profit in their future business.

*"This type of training has so far been unknown to the wood industry on Balkan, and with this step we want to eliminate the boundary of impossible and create an environment where it is possible to follow the trends in business and organizational methods by using this type of training and of course not neglect the everyday responsibilities at work." - said Zoran Vuković, WMTA, trainer and consultant.*

What is remarkable about this approach is that this offer is ordered and financed by the companies that recognise a concrete need for further training. All practical components of the project can be carried out as companies, with concrete project services coached by qualified experts and discussed in advance with the management. In half of the cases tested, the concrete effects occurred immediately after completion of the continuing training measure, in the other half within a period of less than one year. The entire know-how remains in the company and can be further developed on an ongoing basis. One of the ways in which this is achieved is by transferring practical consulting knowledge to the company (and not just to individual participants) within the framework of continuing training. In addition, a package of conditions tailored to the interests of the company was developed.

The industry companies are also showing great interest in neighbouring countries.

### **Outlook and further development**

The approach examined during the trial will be further developed into an e-academy and for various industries.

This includes the implementation of various automation functions for registration and control of the training process. The relaunch of a usable version is planned for 1.10.2019. The final test phase is currently underway.

The evaluation of the results of the prototype testing also revealed that new content was being added.

This includes:

- Module "Lean Management
- ECODesign Circle Economy and Sustainability
- industrial safety
- certification preparation
- technical language

Everyone is cordially invited to participate in the described system. Further information and contact data can be found under [www.innotech-ht.com](http://www.innotech-ht.com).

### **4. Literature**

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