Skills Needs Assessment of the Furniture Sector in Kosovo

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December 2022

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Abbreviations

ARBK	National Register of Companies in Kosovo
ESNAF	Association of Businessman
SHPDF	Association of Wood Processors of Ferizaj
SHPDK	Association of Wood Processors of Kosovo
USHAF	University of Applied Sciences of Ferizaj

Executive Summary

The wood furniture business in Kosovo has proliferated in recent years. However, the development of the industry has highlighted the necessity for qualified staff. Although there is agreement among companies on the necessity for skilled personnel, the requirements for specific competencies and skills to address growth, modernization, and export challenges need to be better articulated. This mixed methods assessment study, involving survey data from 100 companies and interviews with six other stakeholders, seeks to understand existing and upcoming trends in skills needs of the wood furniture sector in Kosovo and to identify basic short-term training needs that will inform training providers and companies to structure the workforce development in the sector. The study focuses on how many employees with a specific skill set are needed annually and at which regions by exploring the following primary objectives:

1. Identify different occupations in the furniture sector
2. To assess the skill level of different employees in the furniture sector
3. Explore the growth trends and technological changes in the sector
4. Forecast employee needs and skills for the period of five years
5. Identify training providers and training programs offered for employees in the sector

First, it analyses the training and education aspects of companies in the furniture industry. It explores how the companies review their training needs for their staff, whether they conduct internal or external training, types of training offered, and knowledge about Universities' programs or external training companies offers. Then it includes different perspectives on how companies deal with the employees in the production processes. It analyses if there are issues in filling vacancies in production, what are the educational level requirements for such positions, and how long does the on-the-job training last.

It continues with a thorough analysis of the skills assessment for the production employees. Initially, it reviews where the skills should be acquired at school or work, providing an essential perspective on what companies expect employees working in production to have learned as skills at school and what they can provide later as in-job or off-job training. Then it explores the skills needed at different organizational levels and focuses on the actual level of skills' proficiency and the future level needed for each of them and strategies for dealing with skills development. Finally, it analyses how companies deal with skills needs from a training perspective.

Last, it focuses on working conditions commonly found in workplaces, and finally, on what innovations have companies introduced lately and how they have impacted the employees' tasks.

Some of the main findings include the analysis of skills needed for the future. It is found that the selection of knives, saws, blades, cutting heads, or belts according to work process, machine functions, and product specifications, together with stalling and adjusting blades, cutting heads, sanding belts, using tools, and following rules, pressing, turning, sanding, and polishing are of relevance for the future. These skills correspond to the increased use of CNC machines or improved production methods where depending on the size of the company the role of the CNC operator and CNC machinist may be separate or combined, thus although there considerable training has been offered especially for the CNC operator role, the study finds further needs for training and identifies the need to develop further skills associated with the role of CNC machinist in the future. Machinery technicians were also the most difficult positions to find, followed by installers and sawing technicians.

Some other skills highlighted during the study are the use of cad software, analytical skills, design skills, and CNC Programming. Other skills, such as sawing, drilling, attaching, reading specifications, or following instructions, are highly valued skills at the moment but will not be requested at a higher numbers in the future. On the other hand, installing, planning, and repairing, which is deemed at an actual good level, will be less likely to be required in high numbers in the future. In addition, the study finds that general numeracy, teamwork, and writing skills are the most mastered by employees. At the same time, foreign languages, computer knowledge, resource planning, innovation/creativity, and other general skills need to be improved.

In addition, it is found that there is a higher demand for being trained in the next three years for knowledge of foreign languages, computers, environment protection, manual and technical skills. The regions which will require more training are Prishtina, Prizren and Ferizaj. The lowest level of demand will come from Viti, Suhareka, Deçan, and Gjakova.

The most important changes reported by the companies are changes in products or services , followed by changes in the organization of work , sales methods or marketing , and work processes mainly influenced by consumers' preferences, technology, and digitalization.

Introduction

Manufacturing is one of the largest and fastest-growing sectors of the global economy. It currently represents 17% of the global GDP (World Bank, 2021). Although the COVID-19 pandemic drastically reduced manufacturing, the severity of the crisis did not have the same adverse effects on the industry as previously estimated (UNIDO, 2022). One of the essential components of the manufacturing industry is the wood sector. The wood industries cover a wide range of industrial activities, including the printing business, the pulp and paper manufacturing and converting sectors, the woodworking sectors, and the furniture sectors. In 2018, approximately 397.000 businesses were engaged in the wood industry in the EU, representing 19.6% of all manufacturing companies (EUROSTAT, 2021). The wood industries contributed €139 billion in gross value added in 2018 and supported 3.1 million jobs, accounting for 10.3% of employment in all manufacturing sectors (EUROSTAT, 2021).

A crucial part of the developments in the wood-based manufacturing business is the increasing need for skilled personnel. A study within the Erasmus+ CBHE MAKING 4.0 project suggests that there is a deficit in knowledge, skills, and competencies of Key Enabling Technologies among EU employees in the wood, furniture, and manufacturing sectors, as well as among students in higher education (Romero Gázquez et al., 2021). Reshaping and upskilling the workforce is required for a sustainable transition into new bio-based value chains (European Commission, 2022). Workers must possess a high degree of multi-skilling to succeed in the knowledge-based wood manufacturing industry.

Developing labour expertise in wood manufacturing is a significant concern for the economies of the Western Balkans, especially for Kosovo. The wood industry in Kosovo is one of the most profitable manufacturing sectors and is thought to have one of the highest potentials for future growth, job generation, and export (Rizvanolli, 2017; Strategy & Development Consulting, 2016). Wood manufacturing in Kosovo accounts for 1,429 employees in 408 companies and an annual turnover of 44.50 million euros (Ministry of Trade and Industry of Kosovo, 2020). In 2019, employment increased by 2.77%, and turnover increased by 17.36% (Ministry of Trade and Industry of Kosovo, 2020). Moreover, in the subsector of wood production, exports increased by 41.94% in 2019 over 2018, and imports increased by 9.07% over the same year (Ministry of Trade and Industry of Kosovo, 2020). A study conducted by Wiegel and Nixha (2018) on the wood furniture sector in Kosovo identifies five internal export barriers: lack of staff with knowledge and experience in exporting; difficulties in finding customers and distributors abroad; lack of modern technology; lack of skilled workforce; lack

of finance for innovation, and five external export barriers: difficulties for personnel to travel to EU countries; lack of workforce with sector-specific skills; perception of "Made in Kosovo" products; certification requirements/quality standards; and difficulties in securing export financing. Companies in the wood manufacturing industry consider the shortage of trained workers as one of the main challenges to the sector's development, as the requirements to adopt new technologies and the demand for higher-quality products in the domestic and international markets increase (Rizvanolli, 2017). Several studies (Rizvanolli, 2017; Wiegel & Nixha 2018) indicate that the workforce needs of the wood manufacturing sector are not being met by the quality of the education system and training provided in Kosovo. These studies emphasize the need to promote vocational education, effectively equipping VET schools, VTCs, and higher education facilities, as well as training instructors and trainers.

This report studies the skills required for wood manufacturing companies. First, it gives insights into sector-level patterns in company management and employment in various wood manufacturing vocations based on secondary data and a survey administered to enterprises in the industry. Second, it analyses occupation-specific competencies for a profession judged critical for realizing the sector's potential.

Methodology

The research uses a mixed method design with consecutive data collection and analysis of surveys with employees and interviews with industry experts and company production managers. Secondary data analysis focuses on identifying regional and global trends in skills needs and training provision that determine the growth path of the wood sector in Kosovo (e.g., trending products/services, inputs, methods of production, experiences, etc.).The primary research consists of a survey designed and distributed to 100 active companies in the wood sector using the simple random method from the ARBK database, covering all regions of Kosovo. In addition, a qualitative analysis was developed with interviews with industry experts, training providers, and production and management directors of the largest companies in the sector.

Data Collection Instruments

Two instruments were used to collect data on the skills inventory for the sector, as well as to inquire about issues related to training.

The first is a questionnaire that quantifies perspectives on such matters from different organizational positions. The second one, the interview, aims to deepen these findings and better understand the phenomena, not only from the company's internal perspective but even from the service providers (training companies) as well as industry associations, which have a broader view of the skills' level in Kosovo.

The Questionnaire

Given the wide range of respondents and the benefits of collecting information from production managers, owners, managing directors, floor supervisors, and other positions, a questionnaire was developed for two levels of employees: 1) owners, manager, and human resources and 2) employees in production . Considering that not all respondents had information on general data on the company, several questions were filtered for level 2 personnel (such as floor supervisors and line/product managers).

As a result, 54 questions were posed to the management of the company on the following modules (see **Error! Reference source not found.**):

- Module 1 contained 19 questions about the firm and the primary and secondary sectors where it operates. Then it is followed by questions for respondents who are owners, executive directors, or human resources managers. The addressed questions continued with other data about the company, exports, employment by gender, age, total number

of employees, especially production, managerial staff, administrative staff, and difficulties filling vacancies.

- Module 2 is related to training and education and has questions to review the skills needs, training provided, and the knowledge of the employees (7 questions).
- Module 3 comprises questions that refer only to employees dealing with manufacturing, number, age, gender, ethnicity, and age. Respondents were asked about vacancies and the difficulty of filling them with employees with the appropriate skills, the level of education required for employees, the need for training, and the duration of the training they completed (8 questions).
- Module 4 covers the professional skills required and required by employees (9 questions).
- And last, Module 5 covered working conditions and drivers of task change (innovation in business) (11 questions)

The Interviews

Six interviews with the following profiles:

- Two managers of the largest companies in the sector
- Two industry experts from the Association of Wood Processors of Kosovo (AWPK)
- Two licensed training providers

The interviews were semi-structured and were conducted after the survey results (see **Error! Reference source not found.**).

Sample Selection

Several companies were identified using a random stratified sample selection based on economic activity NACE code (12.11.2020) for their primary and secondary code 3101, 3102, 3109, 1610, and 1623 in the ARBK database. Priority was given to primary activity, although the secondary activities for NACE codes 1621, 1624, and 1629 were also checked and included. The companies were divided by region and were assigned to surveyors. The first contact was made by phone with each of them. Most of the companies were found to be cooperative, and contacts were exchanged. The following company in the list was accessed if companies refused to participate.

An interviewer sent to the assigned company conducted a face-to-face interview to collect the responses using the questionnaire. As a result, a total of 274 questionnaires were filled with

owners, CEOs, HR Managers, Line/Production Managers, Supervisors, or other management positions in 100 companies (see Table 1), with an average of almost three responses for each company.

Table 1. Number of Companies, Interviews, and Employees of the Sample

	Number of Companies	Number of Employees	Average No. Employees	Number of Interviews
Decan	3	23	8	9
Ferizaj	15	105	8	43
Fushë Kosovë	9	60	8	16
Gjakovë	6	58	10	18
Gjilan	11	129	12	32
Mitrovicë	11	200	15	36
Pejë	19	342	19	56
Podujevë	3	26	9	6
Prishtinë	7	66	11	14
Prizren	13	123	12	32
Suharekë	2	9	5	6
Viti	2	10	5	6
Grand Total	**100**	**1 151**	**12**	**274**

The sample companies total 1.151 employees, with an average of 12 people working in the same organization.

Sample description

A total of 274 responses were collected from different persons in the organization. Most responses come from the Production Manager, followed by the Owner. We prioritized the first in cases where the same person held two different roles.
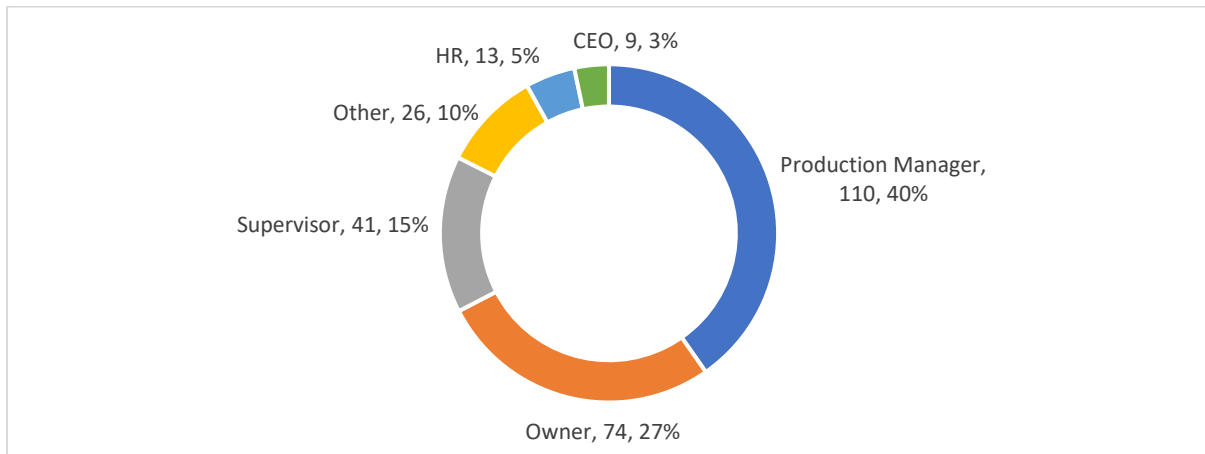
Graph 1. Number of responses by respondents' role

The companies involved in the study are typically small[1]. Micro and small companies comprise most of the sample (54 and 45 cases), while only one medium company with 60 employees.

The average rate of production on total employees is around 76%. While considering an average number of 12 employees, almost three have administrative or managerial functions.

Interestingly, 18 companies have at least one woman working in production processes. The most peculiar case is the case of a company with 40 employees, of which 18 are women. Nevertheless, overall, the rate of women's presence is meagre (almost 4%).

The same considerations can be made for the non-majority employees working in production. A total of 57 non-majority employees are reported, accounting for almost 5% of the total employees of the sample.

The number of foreign employees presented in the companies surveyed is low. Only two companies have stated to have employed four foreign employees in total.

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[1] The European Commission defines micro, small and medium-sized enterprises (SMEs) in the EU Recommendation 2003/361. https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2003:124:0036:0041:en:PDF if fewer than 250 persons are employed; SMEs are further subdivided into micro-enterprises: fewer than ten persons employed; small enterprises: 10 to 49 persons employed; medium-sized enterprises: 50 to 249 persons employed; Large enterprises are defined if 250 or more persons employed.

When one looks at the employees' age, they are between 30 and 50 years old. These numbers are replenished by younger generations (less than 33%), while employees over 50 represent only 9% of the case.

	< 30	30-50	>50
Number of Employees	379 (almost 33%)	670 (almost 58%)	102 (almost 9%)

Export and Certification

Most companies export in the European and regional markets while always having a presence in the local market. Only 24 companies do not sell in the local market but in the European or regional market (see Graph 2).
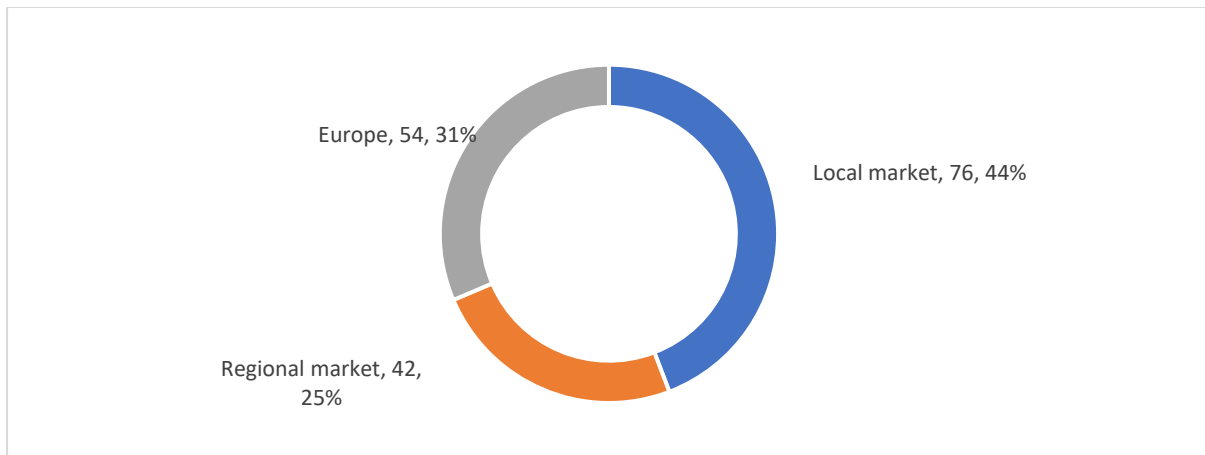
Graph 2. Companies' internationalization

Despite the size effect, 31 cases report having certification for their products (Graph 3). While 12 companies say they do not need certification, the 19 others must abide by export rules and certify the wood origin, and ISO standards.

They assert that the certification is needed regarding the following:

- Wood analysis
- Phytosanitary certification
- Business certification
- ISO9001
- R1-Euro1
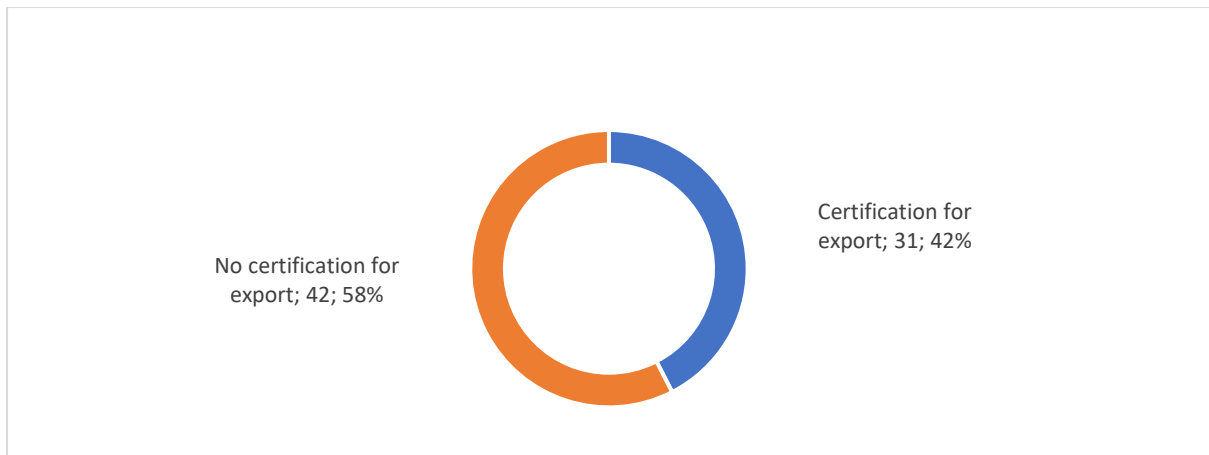
Graph 3. Export and certification

Testing of the products

Most companies test their products (55 companies) (see Graph 4). Usually, testing involves a visual check or different tests for the quality of the mechanisms and other technical matters. In a few cases, physical and material tests are also being done. Below is listed a complete list of the most common tests:

- Pre-assembly testing
- Testing of the quality of the sponge, the types of wood
- Durability tests
- Mechanism testing
- Product stability
- Strength, quality of the products
- Physical and technical tests
- Testing the strength of wood and its moisture content.
- Visual inspection, material control in advance, the stability determination
- Doors, kitchen, humidity, colour tests.
- For defect verification
- Tests of kitchen furniture doors
- Humidity test
- Quality and durability testing
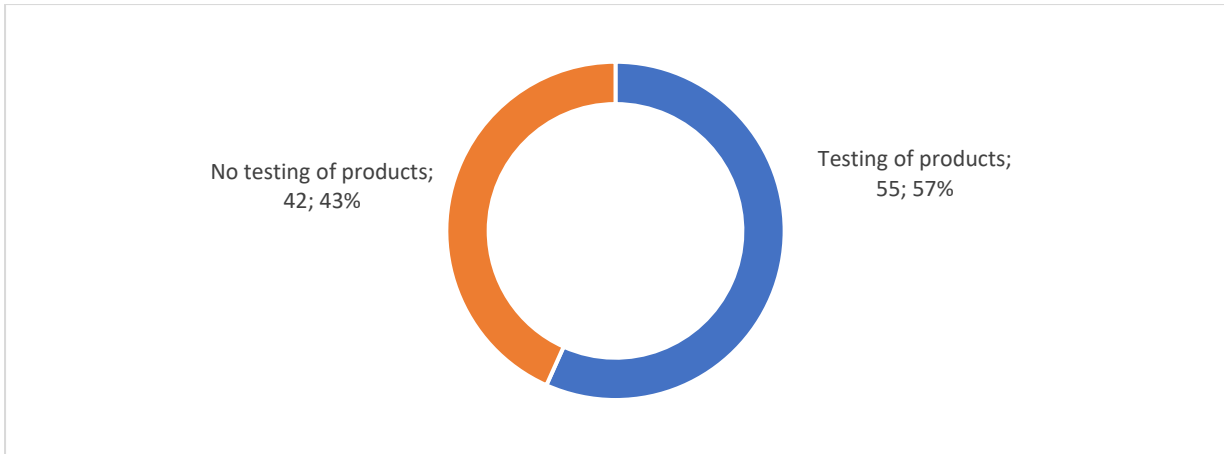
Graph 4. Companies that test their products

Membership in Associations

Only 18 companies are members of different associations (see Graph 5). Three of them are members in more than one association.
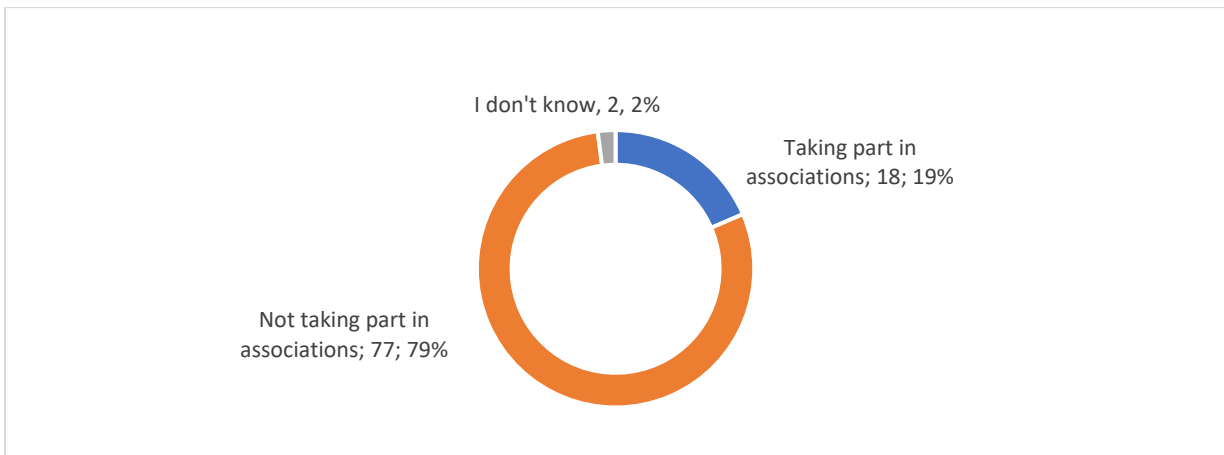
Graph 5. Companies taking part in associations

The leading associations are the Kosovo Wood Production Association "SHPDK" (9 companies), Chamber of Commerce of Kosovo (4 companies), Association of Businessmen "Esnaf" (3 companies) and the National Chamber of Craftsmen (2 companies); (see Graph 6).
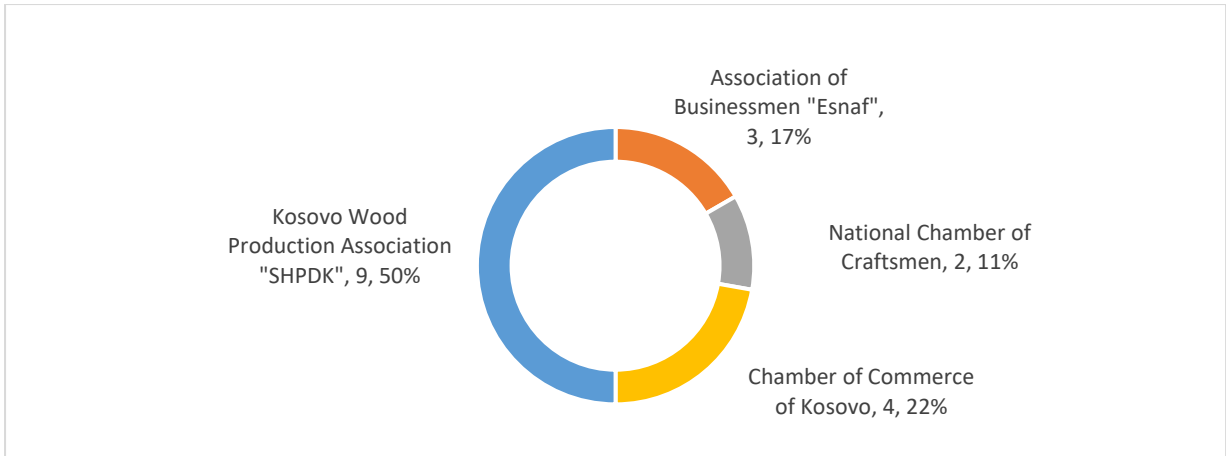
Graph 6. Membership in associations

Findings

The data gathered is analysed and presented in five main areas:

1. Training and Education
2. Production
3. Skills
4. Working conditions
5. Factors that impact tasks

Training and Education

This section includes an overview of the training and education required by companies working in the furniture industry. It analyses how the companies review their training needs for their staff, whether they conduct internal or external training, types of training offered, and knowledge about Universities' programs or external training companies offers.

The respondents were asked whether their companies regularly revised their employees' skills and training needs. While almost 27% of them did not, the rest would give a regular analysis of their skills and training needs for some of the employees (35%) or all of them (38%) (see Graph 7).
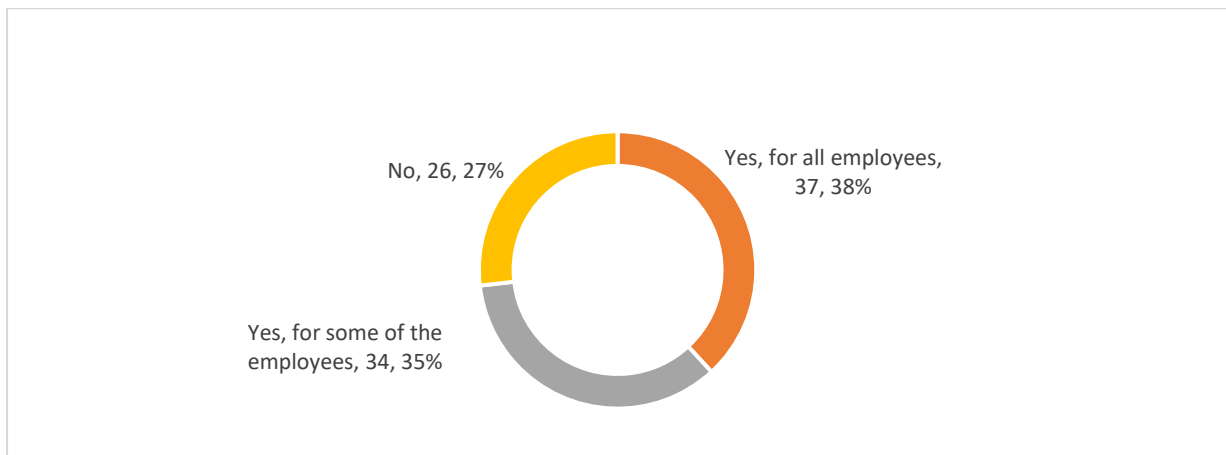
Graph 7. Regular review of skills and training needs for employees

In addition, they were asked whether they were conducting internal or external training for their employees. Only 31% of the companies have held at least one training in the last two years (see Graph 8).
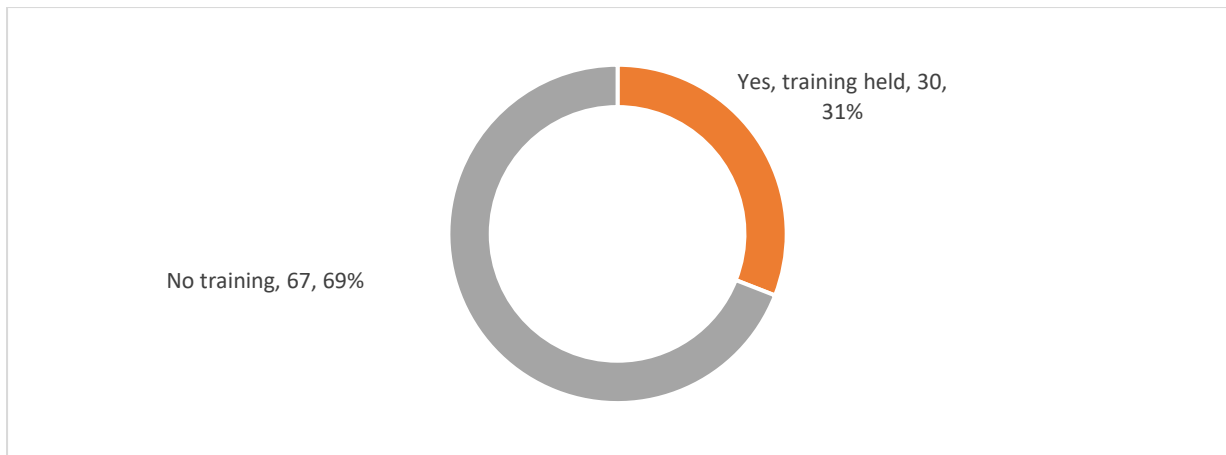
Graph 8. Training held in the last two years

The types of training held by the companies with at least a training in the last two years are presented in Graph 9. Off-job-training accounts for 10% of the cases; only five companies declare to have held training by external companies. The most essential type of training is done in the company. Almost 50% of the training are internships organised by the companies. The rest are on-the-job training offered to employees (33%), while only 5% of the training is organised by third party providers and 4.8 % were declared as other training modalities.
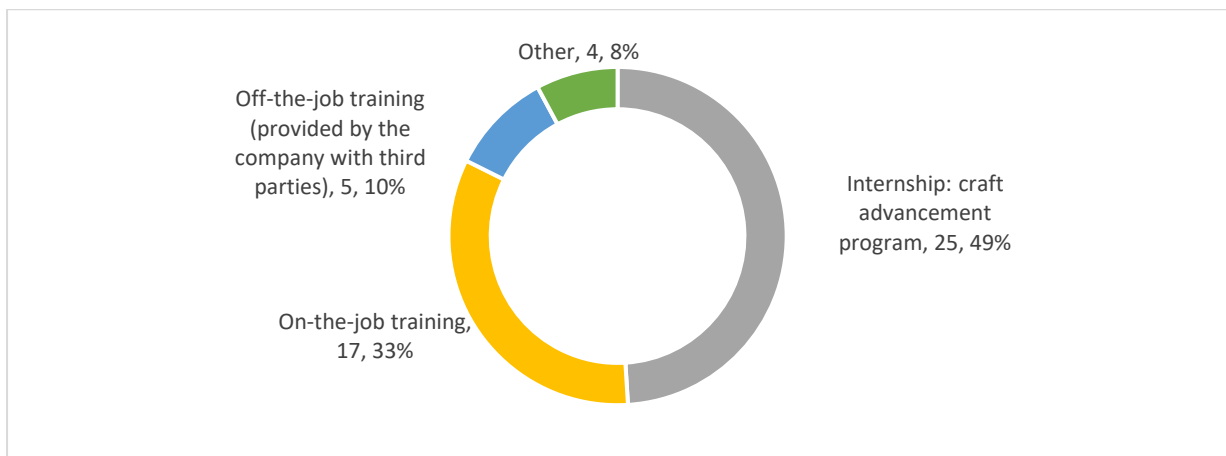
Graph 9. Number of companies by types of training held by companies

*Note: The number of companies is cumulative for types of training held by the same company.

Regarding universities, only 20 companies have some knowledge about the curricula they offer (Graph 10). The most well-known are the University of Applied Sciences of Ferizaj and, to some extent, the University of Pristina.

This is similar to the number of companies knowing the training offered by external companies. Only in 19 cases do companies declare to have such knowledge. The most cited companies are Shehu Academy (5 companies) and Dekoriti (4 companies), followed by ABC Design (1

company) and some cases of international companies which train companies' on their technologies (1 company) and SHPDK (1 company).
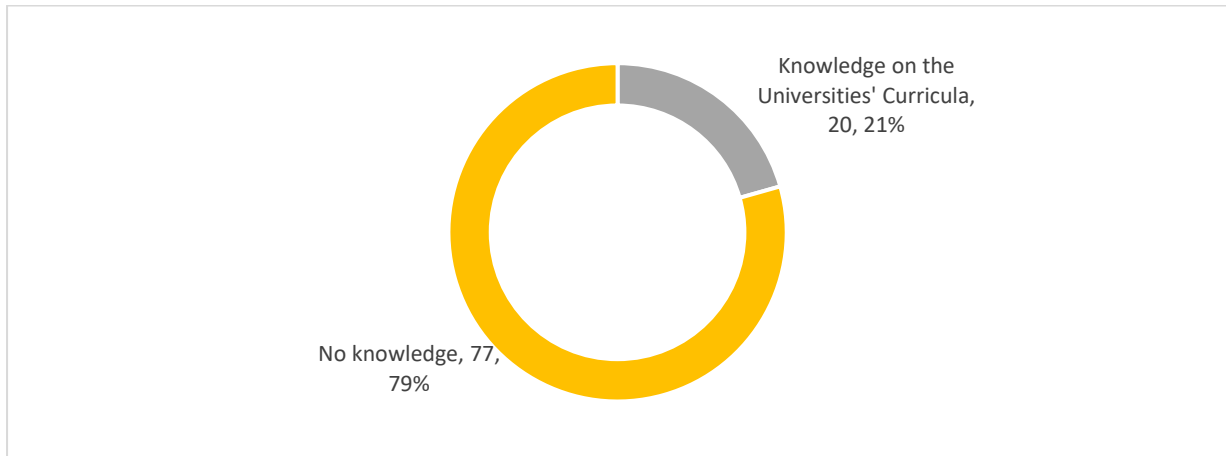
Graph 10. Knowledge of Universities' Curricula
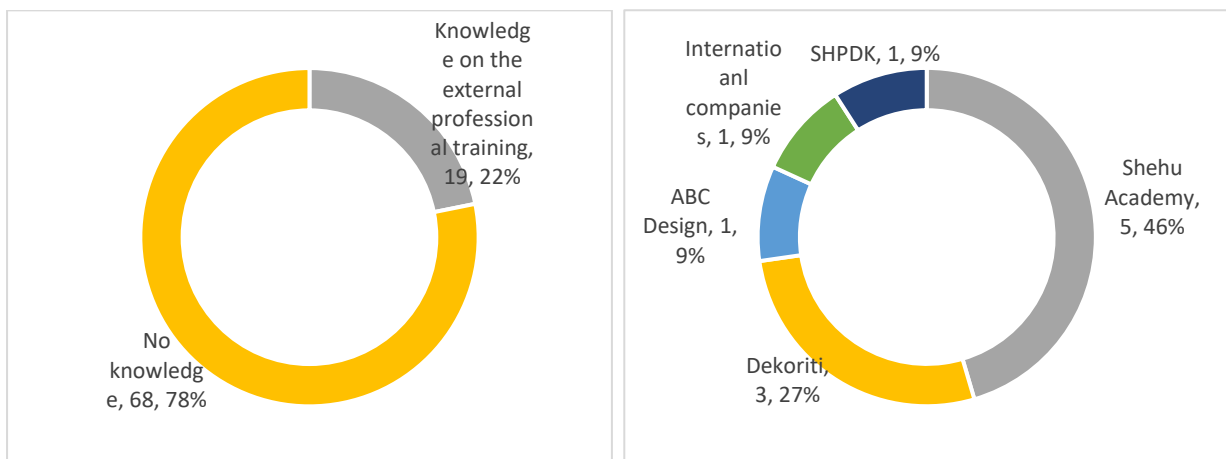
Graph 11. Knowledge of external training options and companies' distribution

Production

This section includes different perspectives on how companies deal with the employees in the production processes. It analyses if there are issues in filling vacancies in production, what are the educational level requirements for such positions, and how long does the on-the-job training last.

Respondents were asked about vacancies in the production area that are difficult to fill due to the lack of adequate applicant skills (Graph 12). Most companies claim to have issues (63%) regarding the applicant's skills.
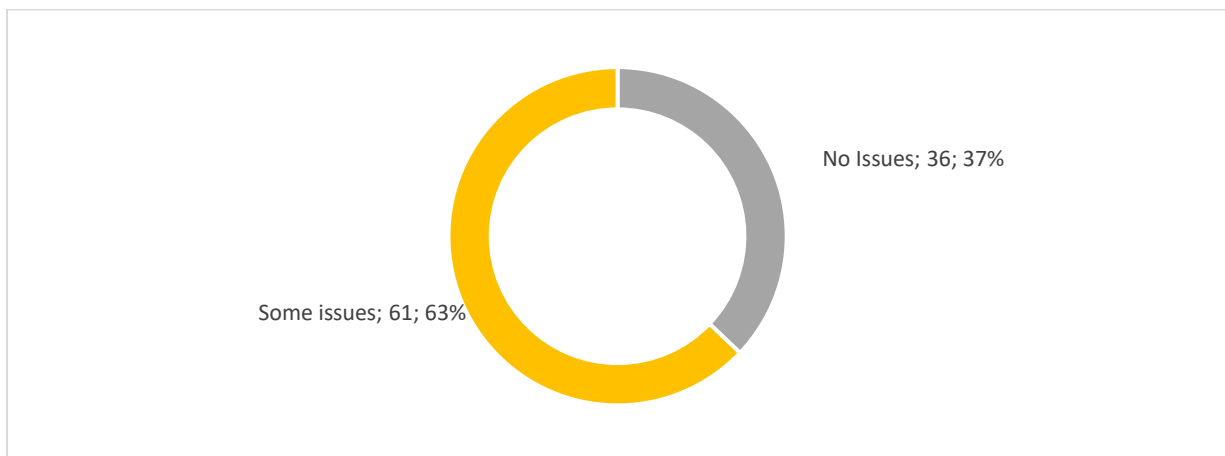
Graph 12. Companies' issues in filling production positions vacancies due to the lack of adequate applicant skills

The required level of education of the employees in production is typically low (Graph 13). Indeed, most companies opt for employees with low education, such as primary school (35%), high school (32%), or professional school (22%). Only 8% of the companies claim to adopt in-job training to reach the level of education needed in production. University is the least required educational level for production (3% of companies).
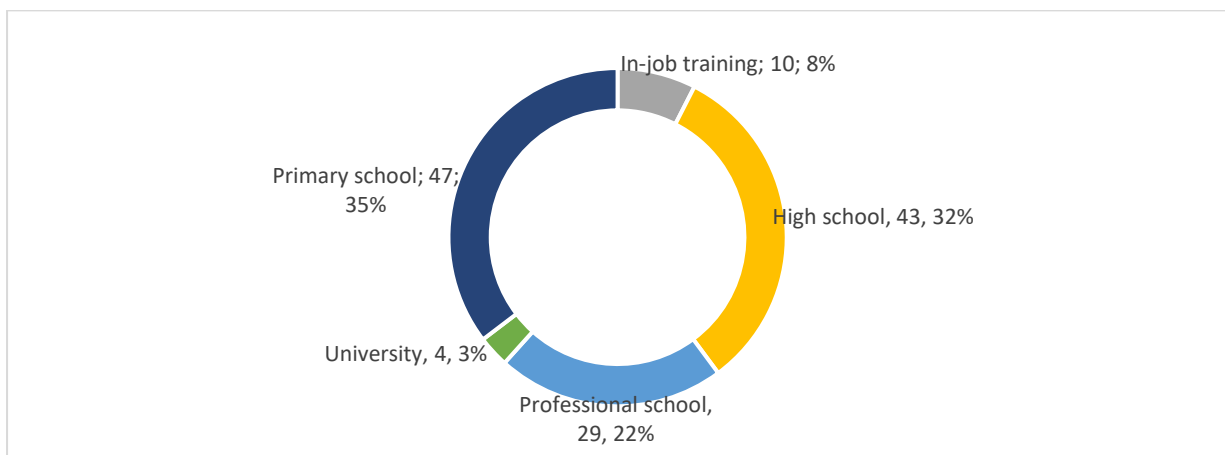
Graph 13. The required education in the production positions

In addition, the companies were asked how many months lasts the typical on-the-job training for new employees in production. Most of them are being trained within three months (53%), while 44% of the cases last from three to twelve months. Very few cases of in-job-training last more than one year (3%).

More than 1 year, 3, 3%

3-12 Months, 43, 44%

Within 3 months, 51, 53%
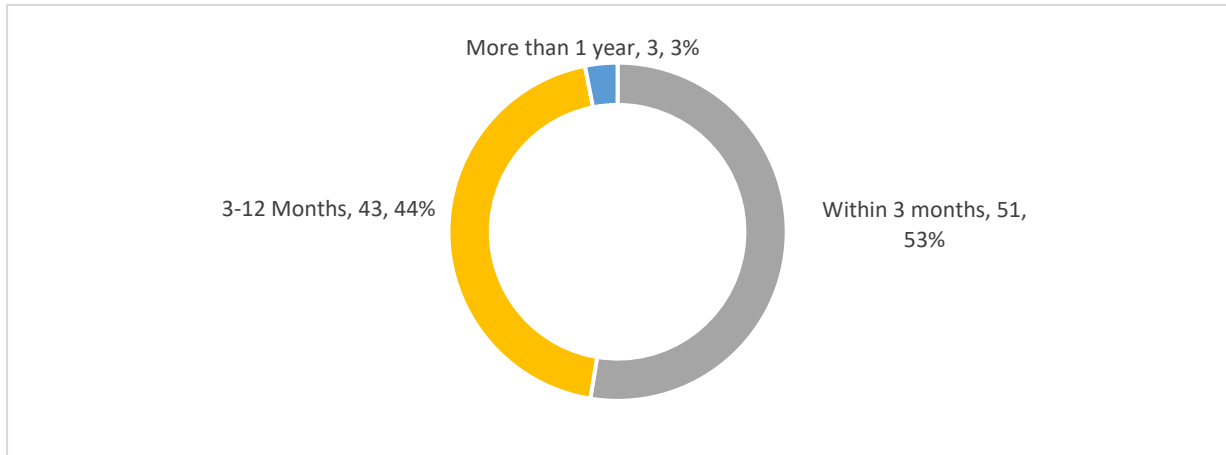
Graph 14. Number of companies* by types of training held by companies

Professional Skills

This section includes a thorough analysis of the skills assessment for the production employees. Initially, it reviews where the skills should be acquired: at school or work. This provides an essential perspective on what companies expect employees working in production to have learned as skills at school and what they can provide later as in-job or off-job training. Then it explores the skills needed at different organizational levels and focuses on the actual level of skills' proficiency and the future level needed for each of them and strategies for dealing with skills development. Finally, it analyses how companies deal with skills needs from a training perspective.

A set of questions were made to the respondents on the skills needed to be acquired at work or school (see Table 2). The two essential skills companies require to be learned at school are sawing and planning. Shaping, installing, drilling, pressing, turning, sanding, carving, repairing, polishing, and attaching are essential skills that can be learned at work. On the other hand, reading and interpreting specifications or following instructions; installing and adjusting blades, cutting heads, sanding belts and using tools and following rules; selecting knives, saws, blades, cutting heads, or belts according to work process, machine functions, and product specifications; setting up and adjusting various types of woodworking machines for operation by others remain skills that can be learned mainly at work, but the school factor is essential as well.

Table 2. Skills required to be learned at work or school

Note: the red colour indicates a lower frequency; the orange, an average-low frequency; the yellow, an average-high frequency and the green colour, a high frequency of data.

	At work	At School
Sawing	27	149
Shaping	142	33
Installing	160	17
Drilling	154	21
Planning	68	111
Pressing	145	22
Turning	145	19
Sanding	135	16
Carving	156	14
Repairing	150	20
Polishing	142	20
Attaching	155	10

Reading and interpreting specifications or following instructions	112	53
Installing and adjusting blades, cutting heads, sanding belts, using tools, and following rules	114	58
Selection of knives, saws, blades, cutting heads, or belts according to work process, machine functions, and product specifications	124	63
Setting up and adjusting various types of woodworking machines for operation by others	114	52

Additionally, respondents were asked to state the working positions where these skills were required (see Table 3). Specifically, most of the skills are requested for the *specialist* position (sawing, shaping, installing, pressing, turning, sanding, carving, repairing, polishing), while the *manager* is the least requested to have those skills, except for the planning skill, which is the most requested for this position, among others. The *operator*'s most important skills include the previous three: installing and adjusting blades, cutting heads, sanding belts, and using tools and following rules; selection of knives, saws, blades, cutting heads, or belts according to work process, machine functions, and product specifications; setting up and adjusting various types of woodworking machines for operation by others. The supervisor should have all the skills, but it is a position that requires an average level of all of them.

Table 3. Skills requirements by positions

Note: the red colour indicates a lower frequency; the orange, an average-low frequency; the yellow, an average-high frequency and the green colour, a high frequency of data.

	All of the positions	Manager	Operator	Specialist	Supervisor
Sawing	45	9	42	70	15
Shaping	46	9	43	62	20
Installing	51	12	34	60	24
Drilling	50	7	46	40	38
Planning	59	57	28	23	14
Pressing	46	9	48	52	22
Turning	47	5	42	58	22
Sanding	48	2	35	69	21
Carving	47	7	35	58	29
Repairing	57	3	28	58	33
Polishing	48	6	48	48	26
Attaching	60	7	37	40	34
Reading and interpreting specifications or following instructions	84	10	41	30	16

Installing and adjusting blades, cutting heads, sanding belts, and using tools and following rules	51	3	69	33	24
Selection of knives, saws, blades, cutting heads, or belts according to work process, machine functions, and product specifications	49	5	80	25	20
Setting up and adjusting various types of woodworking machines for operation by others	54	3	70	27	26

According to the actual level of skills, the respondents point out that the most actual critical skills are making good installations, drilling, reading instructions, and selecting the proper machine functions to follow the specifications of the products. The questions were posed on a scale ranging from 1 (not used) to 5 (used very often).

On the other hand, some other skills might be more critical in the future, such as sanding, pressing, turning, and polishing, together with the ability to install and adjust blades, use tools, and follow the rules as well as the selection of knives saws, blades, cutting heads or belts according to work process, machine functions and product specifications. The scale was transformed, ranging from 0 (no future use of the skill) to 5 (total use in the future).

Table 4 shows the average responses for both actual and future skills. Further elaboration is presented in

Graph 15 . It shows the placement of all skills according to companies' actual and future ranking levels.

Table 4. Level of importance for actual and future skills

Note: the red colour indicates a lower frequency; the orange, an average-low frequency; the yellow, an average-high frequency and the green colour, a high frequency of data.
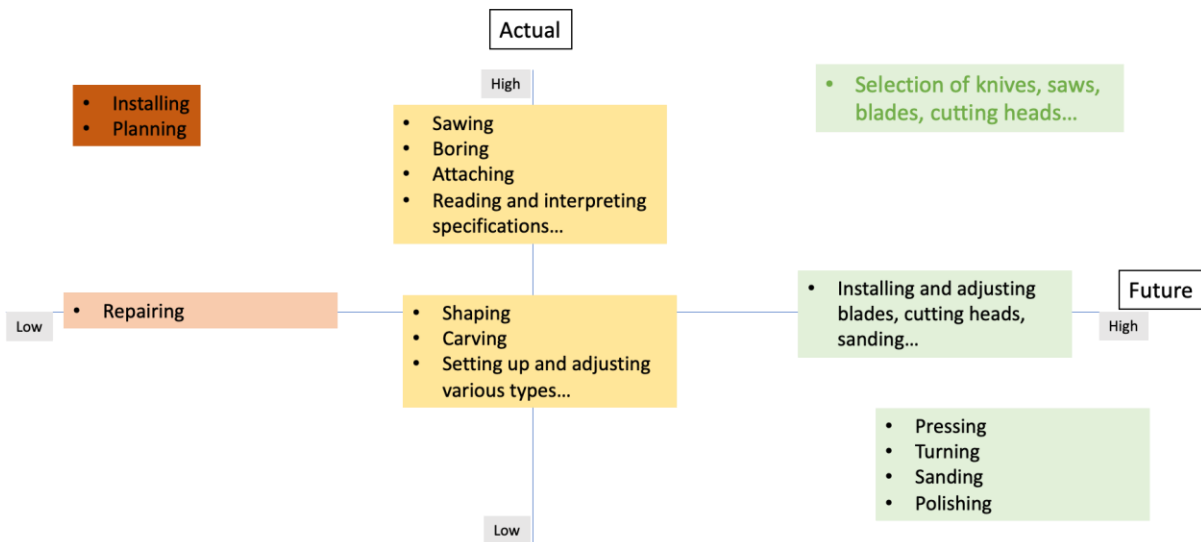
	Actual	Future
Sawing	4,1	4,17
Shaping	3,9	4,25
Installing	4,4	4,09
Drilling	4,2	4,23
Planning	4	4,11
Pressing	3,5	4,37
Turning	3,3	4,34

Sanding	3,4	4,39
Carving	3,7	4,25
Repairing	3,9	4,11
Polishing	3,5	4,38
Attaching	4	4,26
Reading and interpreting specifications or following instructions	4,1	4,22
Installing and adjusting blades, cutting heads, sanding belts, using tools, and following rules	3,8	4,32
Selection of knives, saws, blades, cutting heads, or belts according to work process, machine functions, and product specifications	4,1	4,32
Setting up and adjusting various types of woodworking machines for operation by others	3,7	4,28

Selection of knives, saws, blades, cutting heads, or belts according to work process, machine functions, and product specifications is the most critical skill at the moment and in the future. It is then followed by installing and adjusting blades, cutting heads, sanding belts, and using tools and following rules, which will take more relevance in the future, together with other skills such as pressing, turning, sanding, and polishing. These skills correspond to the increased use of CNC machines or improved production methods where depending on the size of the company the role of the CNC operator and CNC machinist may be separate or combined, thus identifying the need to develop further skills associated with the role of CNC machinist with the responsibility to select and setting up tools, testing the program, ensuring everything works correctly and fixing problems when they occur. Some other skills highlighted during the study are the use of cad software, analytical skills, design skills, and CNC Programming, which are consistent with skills of the CNC programmer mainly responsible for determining how to make a part out of blueprint including the choice of tools, speed and other details to write in the program. This function requires experience in other roles in the production process and working with the machines.

Other skills, such as sawing, drilling, attaching, reading specifications, or following instructions, are highly valued skills at the moment but will not be requested at higher numbers in the future.

On the other hand, installing, planning, and repairing, which are deemed to have an actual good level, will be less likely to be required in the future.

Actual

High

- Installing
- Planning

- Sawing
- Boring
- Attaching
- Reading and interpreting specifications...

- Selection of knives, saws, blades, cutting heads...

Low

- Repairing

- Shaping
- Carving
- Setting up and adjusting various types...

- Installing and adjusting blades, cutting heads, sanding...

Future

High

- Pressing
- Turning
- Sanding
- Polishing

Low

Graph 15 Distribution of skills according to the actual and future level

In addition, respondents were asked to list some other skills that might be required in the future, as necessary. Indeed, almost 50 responses were collected on other skills needed in the future. The most frequently related to technology, CNC skills, marketing, design, innovation and creativity, foreign languages, communication, and technical skills (Graph 16).
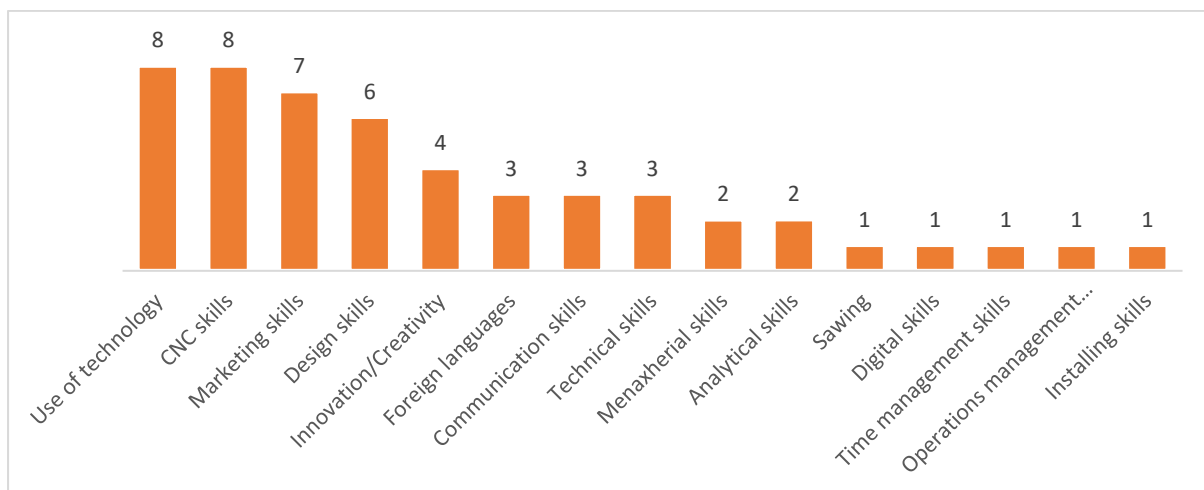
Graph 16. Frequency of other skills needed in the future

Different strategies can be followed in how companies respond to the new skills requirements. In 55 cases, respondents note that they train the actual staff, while another common way to deal with this issue is to reorganize the processes internally (44 cases). Recruiting new staff is not the preferred strategy (only in 17% of cases) (see Graph 17).
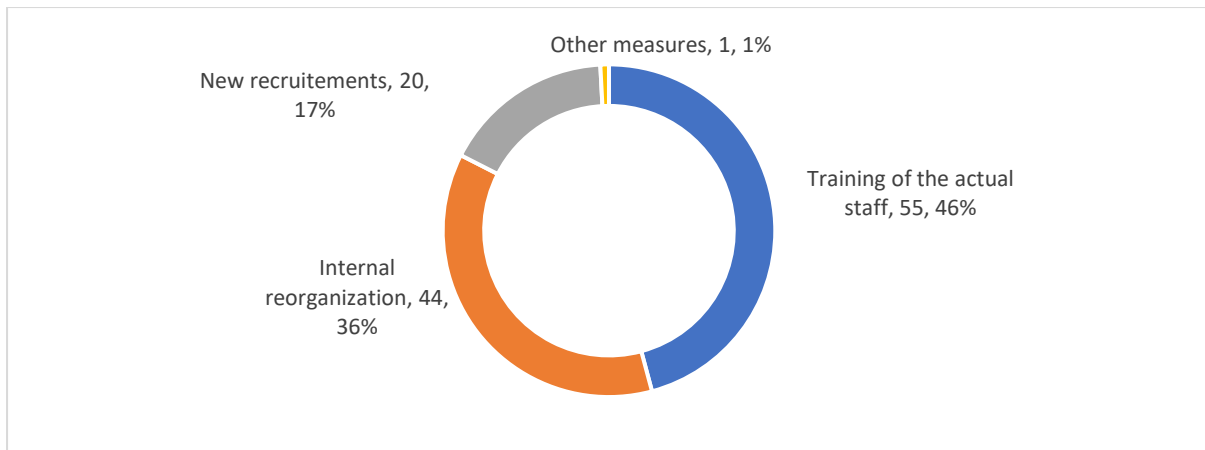
Graph 17. Strategies for dealing with skills development

How companies deal with skills needs

Companies claim to be able to find trainers to develop professional skills quickly. In 82% of the cases, respondents claim to be able to find the sought classes or trainers requested for their employees (Graph 18). Those who admit to having difficulties point out that there needs to be more information on this training or that the quality differs from what they look for. Most of the reasons are related to the fact (as stated by six companies) "there are no professional trainers." In contrast, others have difficulties finding specific training for their needs (i.e., tapestry training).
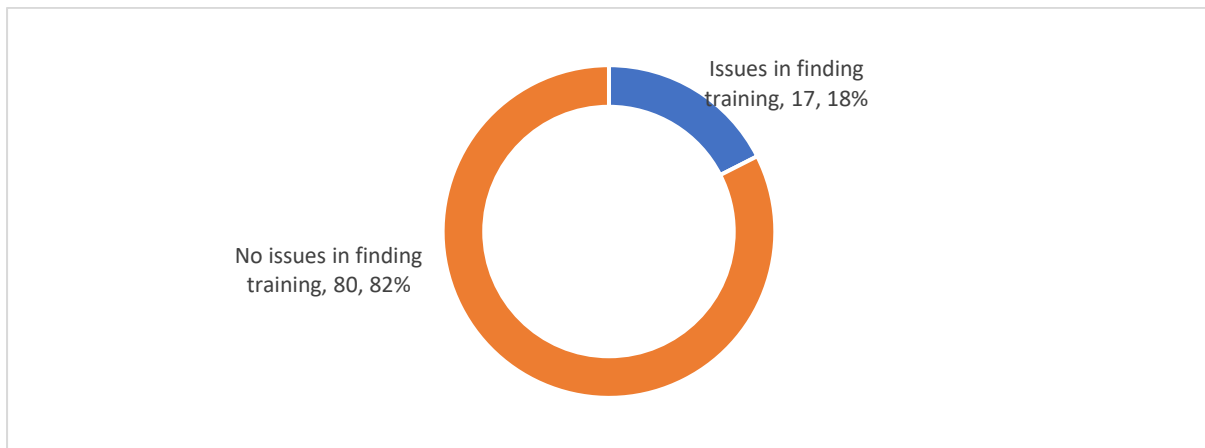
Graph 18. Difficulties in finding classes or trainers to develop personnel skills

Another finding concerns the ability of the company to hire new personnel. Most respondents (62% of cases) assert they do not face difficulties finding new personnel (Graph 19). On the other hand, those who may have issues with such matters claim they need help finding the right skills in the new recruitments, as they need to be qualified for the job or interested.
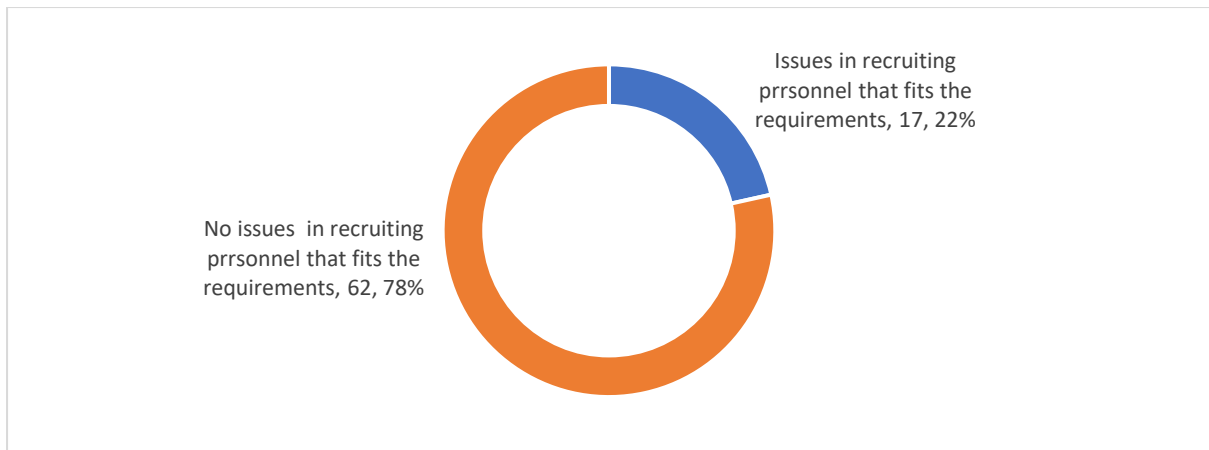
Graph 19. Difficulties in recruiting new staff that fits the requirements

This leads to a markup question regarding companies' interest in paying for a program on skills development (Graph 20). Most companies show to be more interested in investing in such programs. Indeed, almost 71% of the respondents fall into this line, while 39% are extremely interested and 32% claim to have little interest.
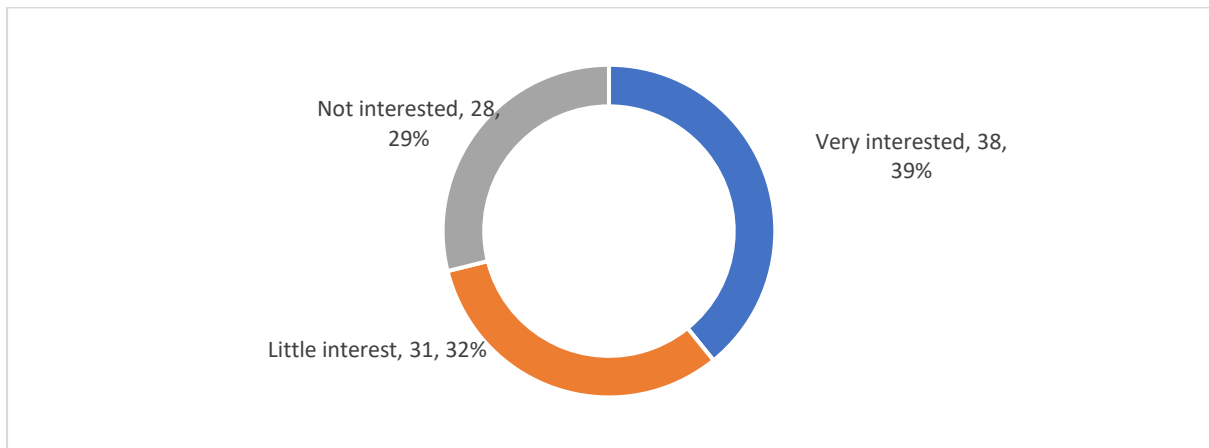
Graph 20. Interest in investing in skills development programs

In addition, respondents were asked about their proficiency and importance level they attributed to different skills on a scale from 1 (lowest level) to 5 (highest level). The skills were: communication skills; computer knowledge; decision-making; environment protection; innovation/creativity; knowledge of foreign languages; knowledge sharing; manual skills; numeracy skills; problem-solving; resources planning; sales skills; team working; technical skills; writing skills. Graph 21 shows both these levels for each of the skills.

It can be noted that numeracy, writing, and teamwork are the most well-owned skills.

On the other hand, companies deem that the most critical skills are knowledge of foreign languages, computer knowledge, and communication skills. It can be noted that where the level of importance is higher than the level of proficiency, there is room for improvement and,

therefore, more training. The skills that fall in this category are computer knowledge, foreign languages, and innovation/creativity. However, communication skills, knowledge sharing, manual skills, problem-solving, resources planning, sales skills, and technical skills show quite an exciting ratio, which points out that while there is some proficiency, there is still a need for improvement. The skills that show less need to be improved are numeracy, environment protection, teamwork, and writing.
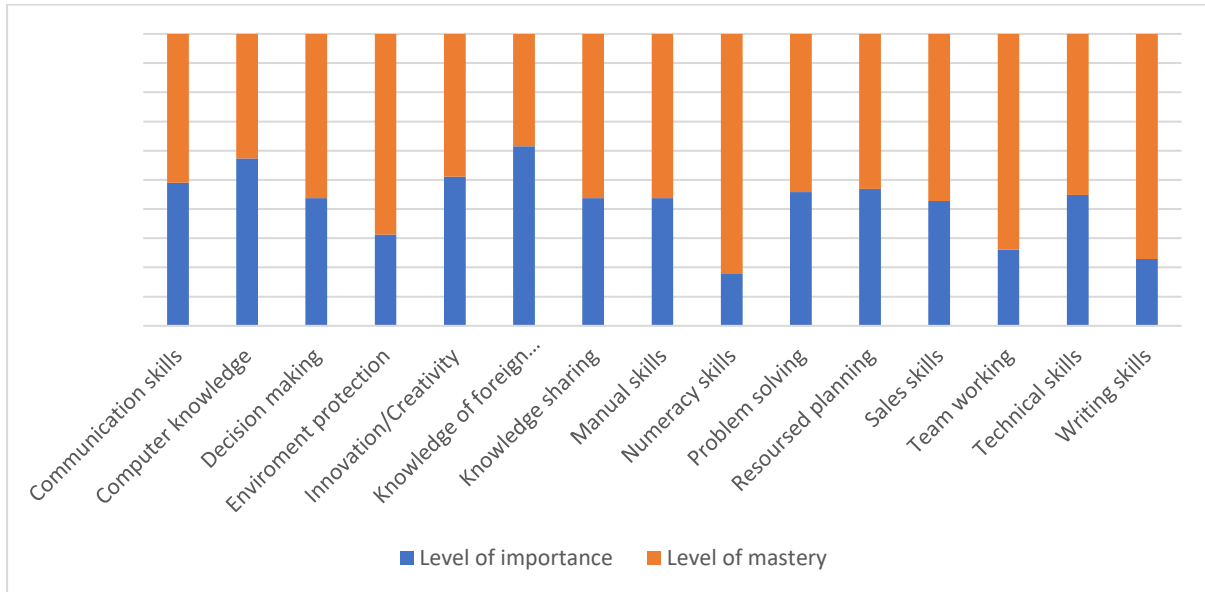
Graph 21. Level of importance and proficiency from the companies' standpoint

Companies were asked to consider the number of employees interested in training for each skill in the next three years (Graph 22). The top five skills that have the highest number of employees to be trained in the next three years are knowledge of foreign languages (289), computers (271), environment protection (248), manual skills (242), and technical skills (242). While this ranking does not necessarily mention the importance of each skill, it can be noted that decision-making and numeracy skills are ranked last.
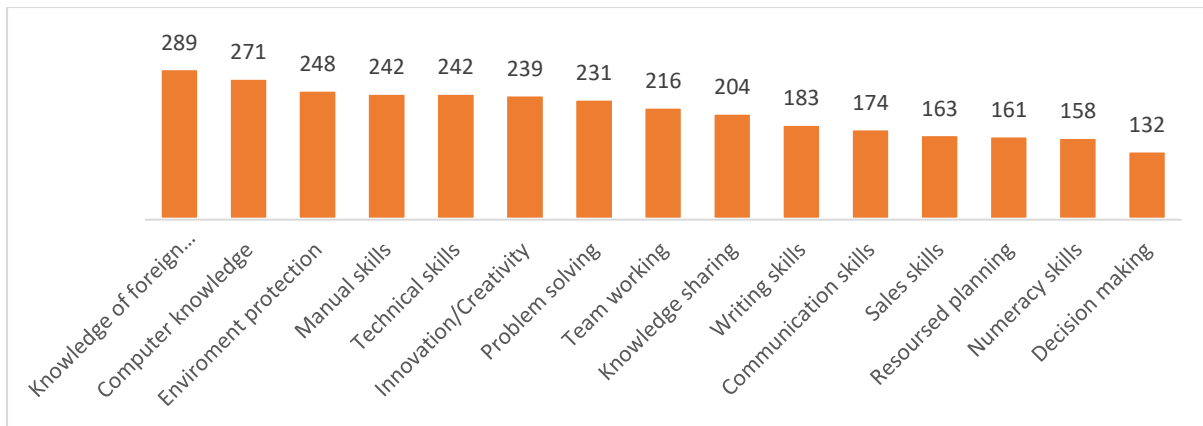
Graph 22. Number of employees to be trained in the next three years for each of the skills

Table 5 indicates the number of employees for each region who need to be trained in the future. It can be noted that Prizren is the one with the highest number of employees to be trained in the future (117 total employees; 9 on average), followed by Mitrovica (71 total employees; 7 on average). The last ones on the list are Viti (2 total employees; 1 on average), Ferizaj (18 total employees; 2 on average), and Peja (33 total employees; 2 on average). On the other hand, Decan has only 15 total employees in need to be trained at least on one skill, but on they have an average number of employees per company (5 on average), relatively high as Podujeva (16 total employees; 6 on average).

On the other hand, looking at the estimation of the number of employees which will need training in the future, the ranking shows some slight differences. This number is estimated by considering the average number of employees which need training in our sample per the number total companies in the region according to ARBK. The region with the highest demand will be Prishtina, with 219 potential employees for skills' training, followed by Prizren with 198 employees and Ferizaj with 192 employees. An average demand is estimated to come from Gjilan (99 employees), Mitrovica (98 employees), Podujeva (78 employees), Fushë-Kosova (76 employees) and Peja (66 employees). While in the lowest level of future demand are Gjakova (28 employees), Decan (25 employees), Suhareka (22 employees) and Viti (13 employees).

Table 5. Number of employees to be trained in the next three years regionally for each of the skill

	Decan	Ferizaj	Fushë Kosovë	Gjakovë	Gjilan	Mitrovicë	Pejë	Podujevë	Prishtinë	Prizren	Suharekë	Viti	Grand Total
Knowledge of foreign language	15	9	29	22	31	63	14	15	19	66	4	2	289
Computer knowledge	11	14	19	4	29	71	33	14	20	52	4	0	271
Environment protection	0	14	12	0	25	52	15	1	16	110	3	0	248
Manual skills	0	14	17	4	23	29	11	13	17	110	4	0	242
Technical skills	8	10	13	5	23	20	24	5	13	117	4	0	242
Innovation/Creativity	9	12	16	16	27	24	15	12	17	88	3	0	239
Problem solving	2	13	7	14	22	23	14	16	15	102	3	0	231
Team work	0	18	4	2	23	32	4	3	18	109	3	0	216
Knowledge sharing	0	8	17	2	26	27	26	12	18	64	4	0	204
Writing Skill	0	9	5	13	19	7	5	5	11	107	2	0	183
Communication skills	3	11	17	9	27	20	17	5	17	44	3	1	174
Sales skills	9	10	13	21	27	16	2	10	16	36	3	0	163
Resources planning	6	12	12	7	20	13	4	12	18	53	4	0	161
Numeracy skills	0	15	0	0	18	8	9	0	11	95	2	0	158
Decision making	11	10	5	13	21	11	6	6	17	27	4	1	132
Number of Employees which need training according to the sample	15	18	29	22	31	71	33	16	20	117	4	2	378
Number of companies in the sample	3	15	9	6	11	11	19	3	7	13	2	2	101
Average per company	5	2	4	4	3	7	2	6	3	9	2	1	4
Total companies in the region	5	96	19	7	33	14	33	13	73	22	11	13	339
Estimated Number of Employees In the region	25	192	76	28	99	98	66	78	219	198	22	13	1.114

* Green colour indicates higher values; yellow colour indicates average-high level; orange colour indicates average-low values; red colour indicates lower values

Another important aspect is related to the positions for which there are difficulties finding employees (see Graph 23). The most difficult employees to find are machinery technicians (49%), followed by installers (39%) and sawing technicians (12%).

Sawing technicians, 9, 12%

Installers, 30, 39%

Machinery technicians, 38, 49%
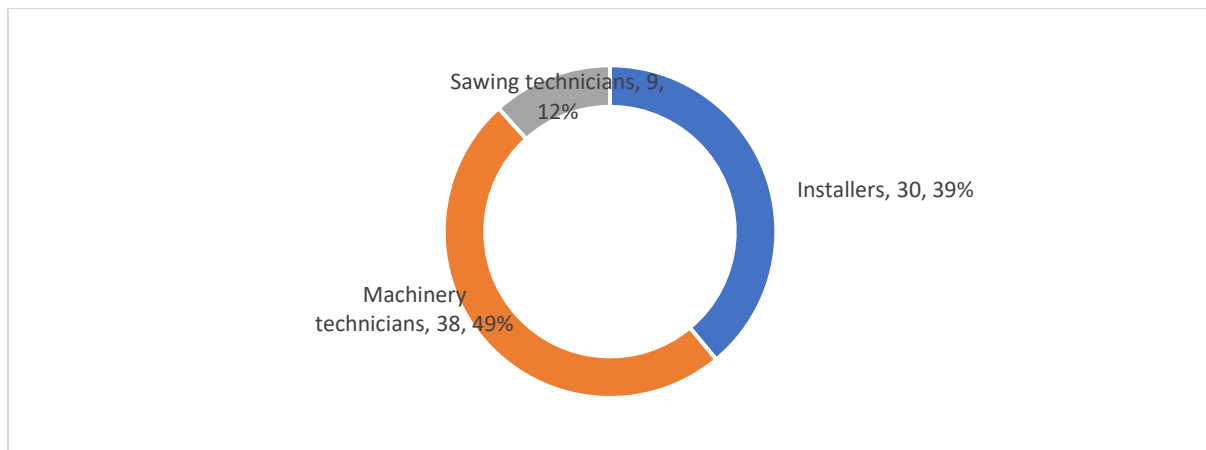
Graph 23. Positions that are difficult to fill

Working conditions

This section investigates the working conditions that are commonly found in workplaces.

A set of options was presented to the respondents on the working conditions, such as it is too hot, there is humidity, it is excellent, there are smells, there is artificial lighting, there are rumours, there is a toxic environment, there is a change of temperature, vibration and other. The most common factor for almost all companies is the level of rumours (accounting for 26% of the conditions), followed by the level of temperature change (14%), vibrations (14%), cold places (10%), smells (10%, artificial lightning (9%), and as reported in more than 23 cases, other conditions, such as the presence of dust, limited space to work, energy cuts (Graph 24).
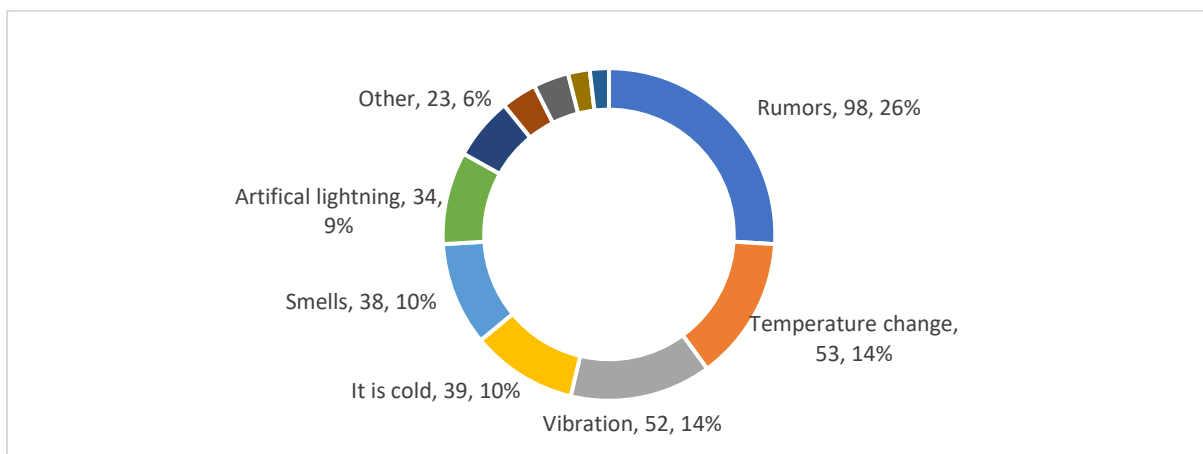
Graph 24. Working conditions

Factors that impact tasks

This section investigates what innovations have been introduced lately in companies and how they have impacted the employees' tasks.

In the last two years, there have been different changes in products or services, processes, sales methods/marketing, and work organization. However, changes in products or services are the most important (32%), followed by changes in the organization of work (26%), sales methods or marketing (21%), and processes (21%) (Graph 25). When looking at which of these changes has impacted the production employees' tasks (Graph 26), it can be noted that there is a correlation between the innovations and changes in the employees' tasks.
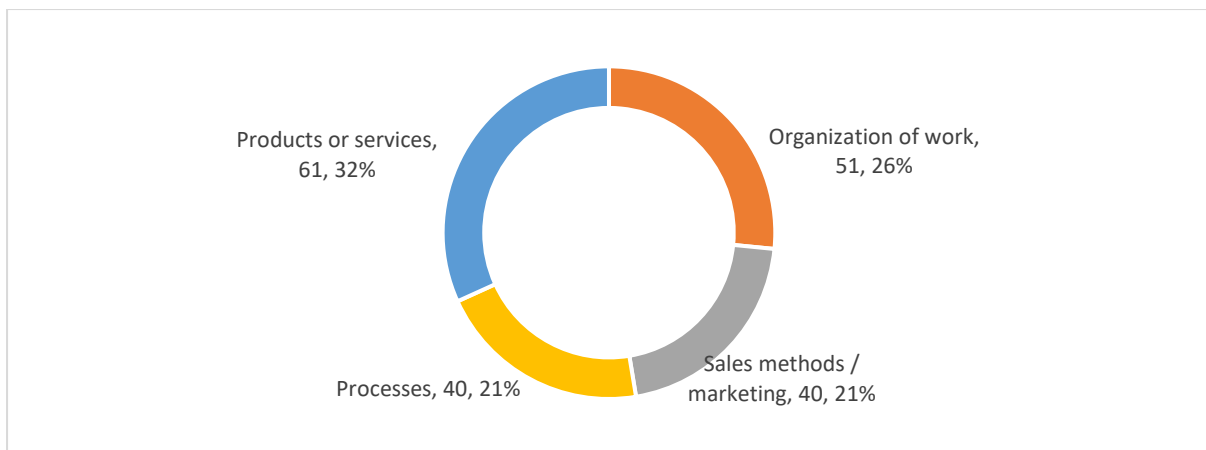
Graph 25. Practices changes due to innovations
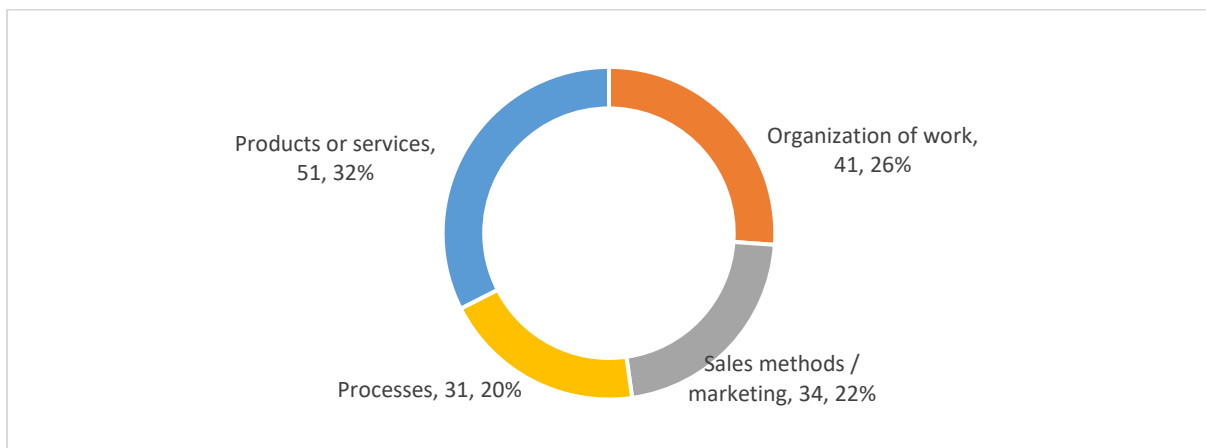
Graph 26. Practices changes with an impact on employees' work

The factors that have led to such changes are related to rank from consumers' preferences (27%) to technology changes (19%), need for digitalization (13%), economy (10%), production

and environmental protection standards (9%), raw materials (9%), human resources (7%), and policies/directives (6%) (see Graph 27).

Graph 27. Factors that lead to changes

Consequently, the respondents were asked to rank the functions affected by the new changes at work and skills' requirements on a scale from 1 (the most affected) to 8 (the leas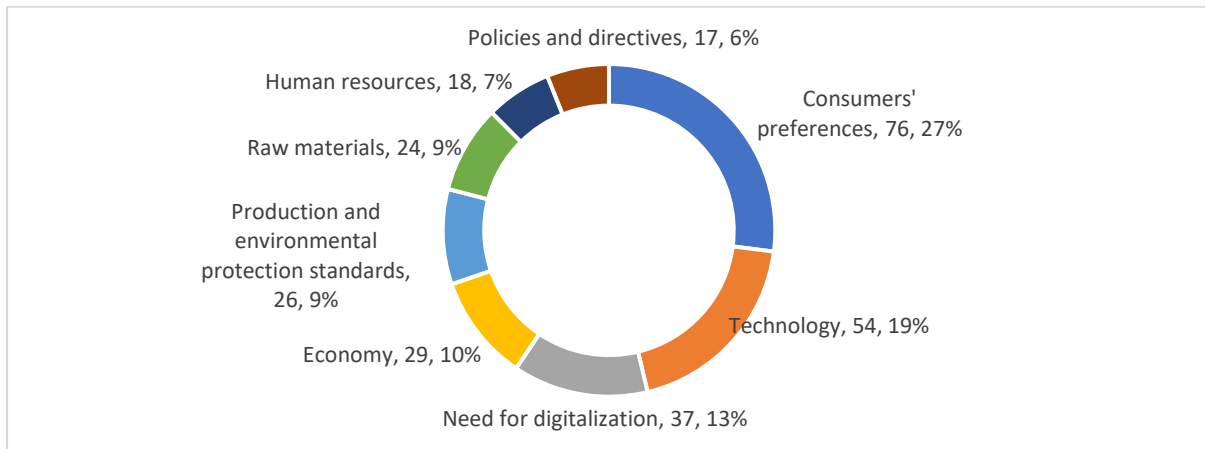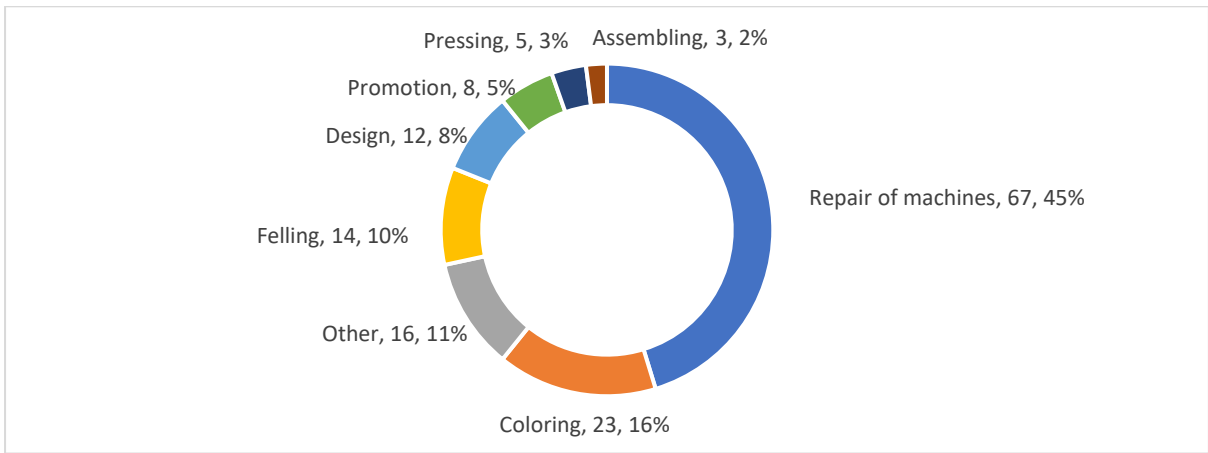t affected). The functions listed are production, sales, finance, design, client relations, logistics, installation, and purchasing. The production function is the most affected, ranked first by 71 companies (Table 6). Then it is followed by sales, ranked second by 36 companies; finance, ranked third by 23 companies; design, ranked fourth by 27 companies.

Table 6. Functions that are affected by changes at work and skill requirements

	8	7	6	5	4	3	2	1
Production	1	0	0	0	4	9	9	71
Sales	2	4	9	9	11	15	36	8
Finance	2	14	15	13	13	23	13	1
Design	2	9	7	12	27	17	13	7
Clients' relations	11	9	14	34	14	6	6	0
Logistics	23	14	29	7	7	9	3	2
Installation	16	33	3	13	10	11	7	1
Purchasing	37	11	17	6	8	4	7	4

Note: the red colour indicates a lower frequency; the orange, an average-low frequency; the yellow, an average-high frequency and the green colour, a high frequency of data.

Regarding the outsourced primary services, companies state that machinery repair is the most frequent (45%). It is then followed by colouring (16%), felling (10%), design (8%), promotion (5%), pressing (3%), and assembling (2%). The other services (11%) are mostly related to glass, mirror instalments, and ironwork.

Pressing, 5, 3%   Assembling, 3, 2%
Promotion, 8, 5%
Design, 12, 8%
Felling, 14, 10%
Other, 16, 11%
Coloring, 23, 16%
Repair of machines, 67, 45%

Graph 28. Services outsourced

Last, a question was posed on whether companies from Ferizaj would deem it necessary to have a support centre for wood processing companies in their area. All of the respondents positively replied to the question, affirming the need of such a centre Graph 29.

No, 0, 0%

Yes, 14, 100%
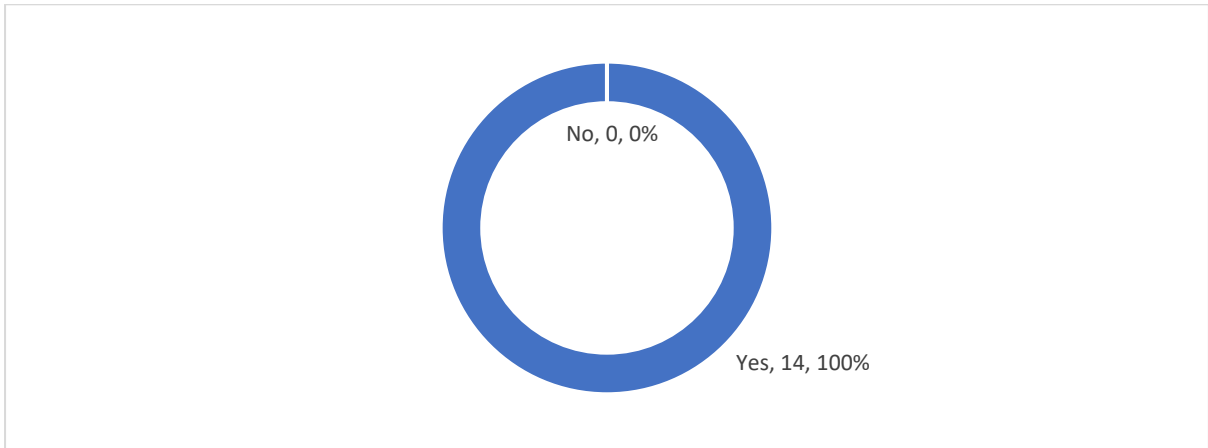
Graph 29. Establishment of a support centre for wood processing companies in Ferizaj?

Interviews

The qualitative analysis focused on three stakeholders: production companies, training companies, and wood furniture associations. The interviews aimed to explore the survey's main topics and better understand some of the findings.

The production companies' protocol included 15 semi-structured questions on innovation and investments, training, human resources, and skills education. The training companies' protocol includes ten semi-structured questions on the knowledge of this specific industry and its relationship with the production companies. The last interview protocol for the associations included nine skills questions.

Error! Reference source not found. shows the list of people interviewed for each organization.

Both companies are considered to have high experience and a significant number of employees:

- *Elnor* was created in 2007 as a family business in Peja. With its expansion, it moved its headquarters to Pristina. Initially, only chairs and tables were included, then the interior, kitchen, bedrooms, sofas, and all products to complete an apartment. They have also recently started working with restaurants and hotels for interior solutions. It has approximately 60 workers. Fifteen of them are women, including the administration. Seeing its challenges in recruiting staff with high skills to operate with new technologies and the need for advancement, the company has openly thought of a training centre that would serve the entire wood processing industry. In 2017, in a joint project with EYE, they prepared the standard for the carpentry profession. After two years, the national qualification agency approved the standard and accredited the training centre.

– Ciao Berto is a family business in its third generation. They have 250 workers, with about 30 women working in administration. The company is divided into four different sectors: 1) Kitchens, bedrooms, and furniture, 2) sofa and furniture, 3)sliding door and 4) PVC plastic.

– Dekoriti was founded in 1989. Seeing its challenges in recruiting staff with high skills to operate with new technologies and the need for advancement, the company has openly thought of a training centre that would serve the entire wood processing industry. In 2017, in a joint project with EYE, they prepared the standard for the

carpentry profession. After two years, the national qualification agency approved the standard and accredited the training centre.

- – Shehu Academy company deals with workforce training in the wood sector. The idea arose from the demand for better-quality products. They have been accredited for two years now. Whereas earlier, they only had training at the workplace. They are also a supplier of wood processing machines such as CNC machines and the latest technology, so they also do the training for operating those machines.

Regarding ***innovation***, both companies are very engaged. One of the companies is collaborating with Italian designers, who often come to train their architects. In addition, they always get training from the companies which have installed their technology (i.e., 5 Aksi). The other is investing in CNC systems to innovate their production processes. *Skills* are an issue for both. Despite continuous training, both companies are not happy with the outcomes. *Education* depends on the position, but usually, manual skills are more critical. There needs to be more knowledge and trust in collaboration with the university. As a company owner, 'I *would first have my providers train the professors and then try them.'* Furthermore, there is 'little *knowledge on the USHAF curricula."* A company claims to have an MoU with USHAF, but not sure whether that is active. There is scepticism for the **Ferizaj's Centre** as well. An owner of a company stated that a professor could not teach *you if he has only read a manual without going once to a CNC production company.'*

Nevertheless, there is recognition that there is potential. As stated from one interviewee "USHAF has excellent students, and it has already given an extraordinary contribution to the industry; now they have included practice as well, which is a great thing since you need to practice in this kind of job."

Regarding *skills*, the most significant demand for training was for CNC operators and those working in the CNC machine corpus server. Training has produced high effectiveness for the trained workers. As one of the owners, "companies who have trained their workers with them have increased their capacities by an average of 37%, up to 60%". It is also pointed out that "*less than 500 people are trained in professional schools, while around 5.000 people work in the industry*". Education covers up to 10% of the sector's needs.

Another critical factor is the timing of the training. One of the owners of a training company states that "the needs are great; the mindset needs to change. As companies demand, these skills and abilities are not achieved within four days. It is impossible. They do not see it as an

investment but as an expense. However, slowly this mindset is changing. Many companies are entering the digitalization process."

As pointed out by one of the interviewees, the ***typical characteristic of a curriculum*** is the modular structure consisting of up to 12 modules which are constantly revised. The shortest module is two weeks and the longest is five weeks. They usually recruit 15 to 20 trainees and plan to advance their training centres.

One of the interviewees states that "USHAF has done progress in terms of changes in their programs, pushed by the industry. In addition, students internships is now obligatory"

According to them, one of the essential features that a training centre should have is 'to *be a manufacturing plant and then a training centre.'* This creates the right environment for learning and working with actual machinery.

Two **associations** were involved as well.

- The Association of Wood Processing Companies of Ferizaj was founded in 2017 at the request of wood processing businesses in Ferizaj, as the National Association of Wood Processing Companies had overlooked the area. In this direction, they needed more success due to the influence of SHPDK. They deem to be very united, with about 55 members.
- The Association of Wood Processing Companies of Kosovo (SHPDK) existed since 2004 with an initial number of 68 founding companies. The goal is to promote interests, support and expand international networks, and improve the quality of products, design, and creativity for export.

The associations aim to continue to "frame innovation because if you do not make changes to the product, you will stay behind." They are aware of the high innovation rate of the industry. As one of the interviewees points out, "*companies release a new product at least every three months. This is considered innovation: new forms, adaptation, designs, prototypes, etc.* He adds that "innovation has no end; even though new products are continuously released, there will always be a need for other innovations."

They recognize the work done by USHAF in improving students' skills. One interviewee states that "USHAF's students have an immediate job placement; nevertheless there is room for improvement."

They point out that the education system needs to provide proper knowledge. One of the interviewees states on vocational training that "*they do not offer enough knowledge that these*

candidates need to work with these devices. They need to follow the trend of machine development. However, they only offer basic knowledge."

Recognizing this, they support training by companies such as Shehu Academy and Dekoriti. Some of the training that associations give focuses on soft skills and preparation for export, in addition to the training offered by these centres, which trains in working with carpentry.

One of the associations has a professional training centre built in Greme with funds from CDF. An investment of around 700K has been made to activate the training centre, where CNC machines are used. Training is organized free of charge. However, there is a high depreciation rate, with other concerns regarding its sustainability.

Conclusions

This study aims to identify the skills challenges facing the wood furniture industry in Kosovo. A mixed methodology was used to better assess existing dynamics and future changes by gathering insights from 100 companies and six other stakeholders.

Some of the main findings are pertinent to the skills required in the industry.

- There is broad recognition of the importance of skills at work. Although most companies evaluate the skills of their employees, the number of them that have conducted internal or external training recently is low (around 31%). On-the-job training and internships remain the most frequent training method, while off-the-job training with third parties or other training modalities were used by only 10% of the companies.

- There is common knowledge of the Universities' curricula. Only 21% have information on what the university is doing, while the rest do not. The same trend can be noted for training companies, where only a few have relied on their services. The training companies and experts interviewed acknowledged changes in the USHAF curricula regarding industry needs and quality improvement with further recommendations to strengthen the practice component.

- Most companies have issues with the fit of the candidates' profiles and the job profile. They claim to need workers with a low level of education, while the rest of the skills can be developed through in-job training. This is backed by the training time, which ranges from one to three months or up to one year as soon as employees get hired.

- Concerning professional skills assessment for the production employees, findings suggest that Sawing and planning are more likely to be acquired at work rather than at school. In addition, some positions were found to have needs for specific skills. The most essential skills for the specialist position are sawing, shaping, installing, pressing, turning, sanding, carving, repairing, and polishing; the *manager* is the least requested to have those skills, except for the planning skill. The *operator*'s most important skills include the previous three: installing and adjusting blades, cutting heads, sanding belts, and using tools and following rules; selection of knives, saws, blades, cutting heads, or belts according to work process, machine functions, and product specifications; setting up and adjusting various types of woodworking machines for operation by others. The supervisor should have all the skills, but it is a position that requires an average level of all of them.

- In addition, the skills were categorized according to actual and future needs. Selection of knives, saws, blades, cutting heads, or belts according to work process, machine functions, and product specifications, together with stalling and adjusting blades, cutting heads, sanding belts, using tools, and following rules, pressing, turning, sanding, and polishing are of relevance for the future. Other skills, such as sawing, drilling, attaching, reading specifications, or following instructions, are highly valued skills at the moment but will not be requested at a higher level in the future. On the other hand, installing, planning, and repairing, which is deemed at an actual good level, will be less likely to be required in the future.

- Other general skills are related to writing, numeracy, problem-solving, foreign languages, manual skills, communication, team working, sales, innovation/creativity, technical skills, environment protection, decision-making, resources planning, computer knowledge, etc. On that matter, the employees' most mastered general skills are numeracy, teamwork, and writing skills. At the same time, foreign languages, computer knowledge, resource planning, innovation/creativity, and other general skills need to be improved. Some other skills highlighted during the study are the use of cad software, analytical skills, design skills, and CNC Programs.

- To improve the skill set, most companies are inclined to train the actual staff, and they report no difficulty finding external companies or consultants to do it. In addition, they find it easy to recruit new personnel. This explains why there is no significant interest in having external training for the staff. However, the industry is evolving with a new awareness of the skill set needed to succeed.

- Other findings are related to the working conditions commonly found in the workplace. The level of rumours, temperature change, vibrations, cold, and smells are among the essential factors.

- Different factors that impact tasks were investigated. In the last two years, there have been different changes in companies' products or services, work organization, sales methods/marketing, and processes. The factors that have led to such changes are related to rank from consumers' preferences to technology changes, need for digitalization, economy, production and environmental protection standards, raw materials, human resources, and policies/directives.

- Regarding the training perspective, there is scepticism regarding the role of the University's curricula. Professors are deemed to have little practical experience, which

is not helpful for companies. In addition, a training centre should first be a manufacturing company with the proper knowledge and infrastructure to work with trainees.

References

Akyazi, T., del Val, P., Goti, A., & Oyarbide, A. (2022). Identifying Future Skill Requirements of Job Profiles for a Sustainable European Manufacturing Industry 4.0. *Recycling, 7*(3), 32.

Barliana, M. S., Ilhamdaniah, I., & Kurnia, D. (2015). Occupational Competence Needs Analysis in Furniture Making Industry. In *3rd UPI International Conference on Technical and Vocational Education and Training* (pp. 132-137). Atlantis Press.

European Commission (2022). *EU Bioeconomy Strategy Progress Report - European Bioeconomy policy: stocktaking and future developments* (COM(2022) 283 Final; SWD(2022) 162 final); Report from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Brussels, Belgium, 2022. https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=COM:2022:283:FIN

EUROSTAT (2021). *Wood products - production and trade.* Data were extracted in December 2021. ISSN 2443-8219. Page consulted on December 10, 2022. Retrieved from: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Wood_products_-_production_and_trade#Wood-based_industries

Łukiewska, K., & Brelik, A. (2021). A Model for Measuring the International Competitiveness of Furniture Industry in the European Union Countries. *European Research Studies*, 24, 334-350.

Manninen, H. (2014). Long-term outlook for engineered wood products in Europe. *European Forest Institute.* Page consulted on December 10, 2022. Retrieved from: http://www.unecefaoiufro.lsu.edu/greenbuilding/documents/2015Mar/gb15-09.pdf

Ministry of Trade and Industry of Kosovo (2020). *Report 2019: Sector C - Manufacturing Industry.* Page consulted on December 10, 2022. Retrieved from: https://mint.rks-gov.net/desk/inc/media/025274DA-3A68-486F-A0D2-33491AAD2E03.pdf

Robert, N., Jonsson, R., Chudy, R., & Camia, A. (2020). The EU bioeconomy: Supporting an employment shift downstream in the wood-based value chains? *Sustainability, 12*(3), 758.

Romero Gázquez, J. L., Bueno Delgado, M. V., Ortega Gras, J. J., Garrido Lova, J., Gómez Gómez, M. V., & Zbiec, M. (2021). Lack of skills, knowledge, and competencies in Higher Education about Industry 4.0 in the manufacturing sector. *RIED. Revista Iberoamericana de Educación a Distancia*, 24(1), pp. 285-313. DOI: http://dx.doi.org/10.5944/ried.24.1.27548

Rizvanolli, A. (2017). *Study of Skills Needs in the Wood Processing Sector in Kosovo: Special Focus on Woodworking-Machine Tool Setters and Operators*. Page consulted on December 10, 2022. Retrieved from: http://www.kec-ks.org/wp-content/uploads/2020/08/Wood-Processing-Report-ENG.pdf

Strategy & Development Consulting (2016). *Skills Assessment for Wood Processing Sector in Kosovo.* Page consulted on December 10, 2022. Retrieved from: http://helvetas-ks.org/eye/file/repository/SD_Wood_Processing_Work_Anglisht.pdf

UNIDO (2022). *World Manufacturing Production Quarter I 2022 Report.* Page consulted on December 10, 2022. Retrieved from: https://stat.unido.org/admin/publicationPdf?documents/QIIP/World_Manufacturing_Production_2022_Q1.pdf&_ga=2.137683958.756361932.1670777351-1762362583.1670777351

Wiegel, W. & Nixha, A. (2018). *Value Chain Analysis of the Sub-Sector of Wooden Furniture.* Ministry of Trade and Industry of Kosovo.

World Bank (2021). Page consulted on December 10, 2022. Retrieved from: https://data.worldbank.org/indicator/NV.IND.MANF.ZS