



MEASUREMENT OF COMPANIES' SATISFACTION WITH COOPERATIVE MODEL OF VOCATIONAL EDUCATION

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1. INTRODUCTION

In the context of economic and social development, vocational education should provide quality human capital which is capable, thanks to its competency, of responding to needs and everyday challenges at a workplace both in the domain of one's own scope of work and in the field of professional relations with other employees in a company.

Modernisation of vocational education is one of the key labour market's requirements. Recognising the businesses' need for young professionals, ready to step into the real-life world of labour from day one, the Ministry of Education, Science and Technological Development, in collaboration with the German Organisation for International Cooperation (GIZ), through the "Vocational Secondary Education Reform in Serbia" project, as of 2014/2015 school year, started the implementation of a vocational secondary education cooperative model in three three-year-long educational profiles: locksmith-welder, electrician and industrial mechanic.

The vocational education cooperative model had been developed pursuant to the possibilities of the Serbian economy, the existing practices and institutional capacities. This model is based on the division of responsibilities for acquisition of competencies between vocational secondary schools and employers. In the first generation, the model's implementation encompassed 8 vocational secondary schools and 35 companies.

Even prior to the cooperative model's introduction, companies had been participating in the implementation of the vocational secondary education, particularly with regard to three-year educational profiles. Practical instruction in its entirety or in part, through block scheduling, had been taking place in real working conditions under the supervision of practical instruction teachers. However, the cooperative model entails systemic involvement of companies in the educational process, not only by providing a place for practical instruction (space, equipment, tools and materials) but also by introducing an instructor – the employees tasked with teaching and monitoring of learning progress within the company.

Up to this year, two generations of industrial mechanics¹ and one generation of locksmiths-welders welders and electricians had completed their respective education.

This survey's objective is to look into the companies' satisfaction with the vocational education cooperative model's implementation thus far. The survey entailed interviewing 28 companies which had provided practical instruction to one (or two in the case of "Robert Bosch") generation(s) of students. It was designed to analyse the implementation of the practical instruction at companies – their experiences therewith, identification of challenges which the companies were facing in respect of the students and learning process, but also with regard to the cooperation with vocational secondary schools.

In the meantime, Dual Education Act has been adopted in Serbia which is to come into effect as of 1 September 2019. Specific experiences from the cooperative model's experiences were incorporated into

¹ Vocational school 'Milenko Verkić Neša', in collaboration with 'Robert Bosch' company, implemented educational process in the first year for the first- and second-grade students of industrial mechanic educational profile.

this legal solution. However, there are challenges which the companies are facing in the cooperative model's implementation, which must be resolved in the forthcoming period so as to render the cooperative and dual education model more efficient and effective.

2. METHODOLOGY

This survey entailed measurement of companies' satisfaction with the cooperative model practical instruction's implementation. It encompassed polling and in-person interviews with 28 companies selected by GIZ, which were involved in cooperation with the school as of 2014/2015 school year onwards. The number of companies which have adopted the cooperative model to date is larger than the number of interviewed companies.

The survey was conducted in two phases as follows: (I) first phase – online polling of companies; (II) second phase – in person interviews with a semi-structured questionnaire.

The survey's first phase was a preparatory part of the analysis, which provided basic information about the companies and the practical instruction being carried out. The questions were divided into three segments: (1) basic information about practical instruction at a given company - the period in which the company started cooperating with the school in the practical instruction's implementation; for which educational profiles the school is providing support; the number of students whom the given company accepted; the number of girls, etc.; (2) basic information about companies' satisfaction with the cooperative model – above all, about their satisfaction with the updated educational profiles, as well as students' satisfaction with acquired knowledge and skills after attending practical instruction; (3) basic information about perspective – i.e. if the given company would like to continue its cooperation with the school in the practical instruction's implementation.

The survey's second phase consisted of in-person interviews on the basis of a semi-structured questionnaire. The objective of the second phase was to come by detailed information through in-depth interviews as to what costs and benefits arising from the implementation of practical instruction within the company are incurred; if the companies are satisfied and, if so, with which aspects; which segments where there is a need for improvement are.

Companies' management was covered by interviews, as well as instructors tasked with coordinating practical instruction within the companies. Depending on the size of the company in question, the management and instructors' structure varied. Although this may not necessarily always be the rule, big companies often have instructors who are specially tasked with coordinating practical instruction, whereas master craftsmen in charge of various segments in the manufacturing process are working directly with the students.² In such situations, the interviewing team endeavoured to interview then both the

² In the cooperative model terminology, there is a term 'mentor' for a company employee who is entrusted with coordinating practical instruction. However, another term - 'instructor' - was introduced with the adoption of the Dual Education Act, hence, to avoid confusion, the report will use the term 'instructor'.

instructors (coordinators) and master craftsmen who were working directly with the students. On the other hand, as a rule, micro and small companies do not have a person specially tasked with coordinating practical instruction. These are their employees who are both coordinating practical instruction and working directly with students on assignments. Similarly, medium-sized and big companies' management are participating in the activities of coordination with the school, whereas micro and small companies' respective owners partake in coordination with the school.

Questionnaires in both survey phases also featured questions requesting the interviewees to give their assessment of various practical instruction's aspects (how would they mark the cooperation with the school, students' performance, etc.). Rating was closed in its character on a 1-to-6 sliding scale (online questionnaire), and a 1-to-4 scale (the questionnaire for in-person interviews). In both phases, the scale was "reversed" relative to the marking system at schools. Namely, mark "1" represents the highest mark in terms of satisfaction (meaning *"very satisfied"*). On the other hand, mark "6" (online questionnaire) and mark "4" (questionnaire for in-person interviews) represent the lowest mark (most often meaning *"dissatisfied"*). The marks in-between denote various degrees of satisfaction between these extremities.

Description of the set of interviewed businesses

Interviewed companies, apart from individual analyses, were grouped by several criteria and analysed so that possible irregularities would be detected. The criteria were as follows:

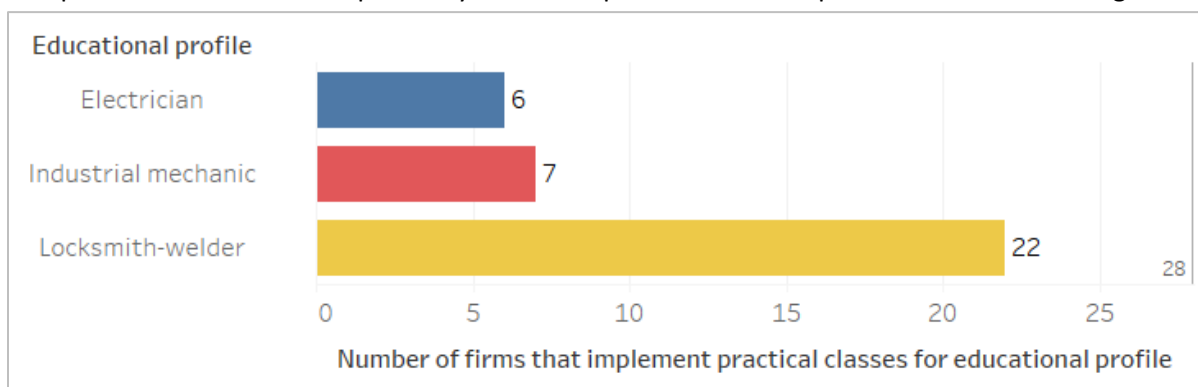
- **Educational profile of students receiving practical instruction** – three educational profiles: locksmith-welder, industrial mechanic and electrician
- **Region in which the given company operates** – eight regions: Kragujevac, Kraljevo, Lazarevac, Mladenovac, Novi Sad, Obrenovac, Subotica and Šimanovci
- **Company size**³ – big companies, medium-sized and small companies
- **Company ownership**⁴ – foreign-owned, domestic private ownership and state ownership

Educational profile: Most companies organise practical instruction for locksmith-welder profile (22 companies – graph 1). On the other hand, 7 companies are organising practical instruction for the industrial mechanic profile, out of which the most are based in Kragujevac and Subotica, and where 4 are foreign-owned. Another 6 companies are organising practical instruction for the electrician profile, including all 4 state-run firms in this set of companies. Some firms are implementing practical instruction for two educational profiles (table 1).

³ Number of formally employed persons defines the company size: small company (up to 49 employees); medium-sized company (from 50 to 249 employees), big company (250 or more employees).

⁴ Share in the ownership structure exceeding 50%. E.g. a state-run company is any company in whose ownership structure the state holds a share in excess of 50%

Graph 1: Distribution of companies by education profiles for which practical instruction is organised

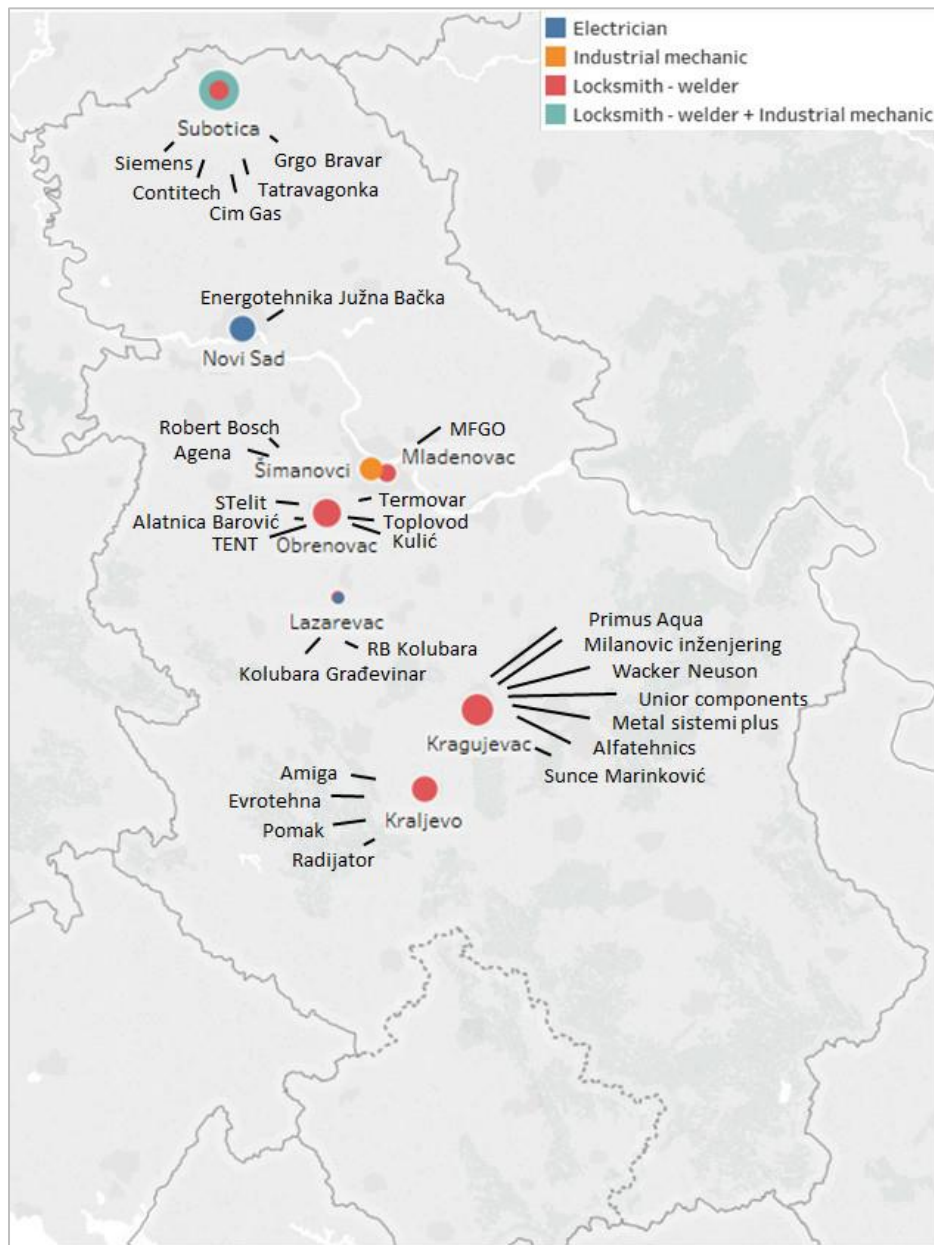


Source: GIZ, Company surveys

Region: Interviewed companies are geographically distributed in eight cities and their respective surrounding areas. For the purpose of simplifying terminology, the analysis shall hereinafter refer to the territory comprising the city, its surrounding area, as well as the industrial zone therein, as the *region*. The companies are regionally connected via, above all, secondary schools from which the students are coming, hence we have 8 secondary schools in the following regions:

1. **Subotica** - Technical School "Ivan Sarić" Subotica.
2. **Obrenovac** - Technical school Obrenovac
3. **Kragujevac** - Polytechnic school, Kragujevac
4. **Kraljevo** - Mechanical Technical School, "14. October", Kraljevo
5. **Šimanovci** - Technical school "Milenko Verkic Nesa", Pecinci
6. **Lazarevac** - Technical school "Kolubara", Lazarevac
7. **Novi Sad** - Electrotechnical school "Mihailo Pupin" Novi Sad
8. **Mladenovac** - Technical school Mladenovac

Graph 2. Interviewed companies by regions



More detailed information on interviewed companies for previously mentioned criteria can be found in the table 1. Columns which are related to the educational profiles are presented in a form of *dummy* variables – and they take values 0 or 1, depending on whether the company conduct practical classes for observed profile or not (1 – yes; 0 – no).

Table 1. The structure of interviewed companies

| Region / Firms | Activity | Firm size | Ownership | # employees | # Students | Locksmith welders | Industrial mechanic | Electrician |
|---------------------------------|---|-----------|------------------|-------------|------------|-------------------|---------------------|-------------|
| Kragujevac | | | | | 30 | | | |
| Milanovic inženjering | Machining of metals | Large | Private domestic | 297 | 9 | 1 | 0 | 0 |
| WACKER NEUSON | Lifting and transmission equipment | Large | Foreign | 275 | 6 | 1 | 0 | 0 |
| Unior Components | Manufacture of tools | Medium | Foreign | 159 | 2 | 1 | 0 | 0 |
| Alfatehnics | Machining of metals | Medium | Private domestic | 101 | 5 | 1 | 0 | 0 |
| Sunce Marinkovic | Metal doors and windows | Medium | Private domestic | 76 | 4 | 1 | 0 | 0 |
| Metal sistemi plus | Machining of metals | Small | Private domestic | 49 | 2 | 1 | 0 | 0 |
| Primus aqua | Boilers and radiators for central heating | Small | Private domestic | 20 | 2 | 1 | 0 | 0 |
| Kraljevo | | | | | 20 | | | |
| Radijator inženjering | Boilers and radiators for central heating | Large | Private domestic | 345 | 9 | 1 | 0 | 0 |
| Amiga doo | Metal constructions and parts | Medium | Private domestic | 208 | 4 | 1 | 0 | 0 |
| Evrotehna doo | Other metal products | Medium | Private domestic | 64 | 5 | 1 | 0 | 0 |
| Pomak doo Kraljevo | Machines for agriculture and forestry | Medium | Private domestic | 53 | 2 | 1 | 0 | 0 |
| Lazarevac | | | | | 13 | | | |
| RB "Kolubara" | Exploitation of coal | Large | State | 12.708 | 8 | 0 | 0 | 1 |
| Kolubara građevinar | Specific construction works | Large | State | 693 | 5 | 0 | 0 | 1 |
| Mladenovac | | | | 105 | 10 | | | |
| MFGO (Progres) | Machines for mines and quarries | Medium | Foreign | 105 | 10 | 1 | 0 | 0 |
| Novi Sad | | | | 297 | 20 | | | |
| Energotehnika-Južna Bačka | Electrical and telecommunication lines | Large | Private domestic | 297 | 20 | 0 | 0 | 1 |
| Obrenovac | | | | | 36 | | | |
| JP Elektroprivreda Srbije, TENT | Electricity production | Large | State | 2.442 | 12 | 1 | 0 | 0 |
| JKP"Toplovod" Obrenovac | Steam supply and air conditioning | Medium | State | 115 | 8 | 1 | 0 | 0 |
| Alatnica Barović | Metalworking machines | Small | Private domestic | 45 | 8 | 1 | 0 | 0 |
| "Stelit 90" doo | Machines for special purposes | Small | Private domestic | 18 | 2 | 1 | 0 | 0 |
| PD"TERMOVAR" pro doo | Metal tanks and reservoirs | Small | Private domestic | 10 | 5 | 1 | 0 | 0 |
| SZR "Kulić" | Production of exhausts | Micro | Private domestic | 8 | 1 | 1 | 0 | 0 |
| Subotica | | | | | 60 | | | |
| Siemens d.o.o. Beograd | Production of wind turbine generators | Large | Foreign | 1.832 | 22 | 1 | 1 | 0 |
| CONTITECH FLUID SERBIA D.O.O. | Other rubber products | Large | Foreign | 745 | 14 | 1 | 1 | 0 |
| Tatravagonka Bratstvo D.O.O. | Locomotives and rail vehicles | Large | Foreign | 263 | 9 | 1 | 0 | 0 |
| D.O.O. "GRGO BRAVAR" | Metal constructions and parts | Medium | Private domestic | 102 | 13 | 1 | 1 | 0 |
| CIM GAS D.O.O. | Installation of plumbing systems | Medium | Private domestic | 53 | 2 | 1 | 0 | 0 |
| Šimanovci | | | | | 26 | | | |
| Robert Bosch | Electrical and electronic equipment | Large | Foreign | 961 | 20 | 0 | 1 | 1 |
| Agna Technology | Metalworking machines | Medium | Foreign | 90 | 6 | 0 | 1 | 0 |

Source: BRA, GIZ, Company surveys

The largest share of companies are in domestic private ownership which admitted 44% of students. Among these firms, most are SMEs. On the other hand, 41% of students had their practical training in foreign companies, and 15% in state-owned companies.

Table 2: Number of students and firms, by firm size

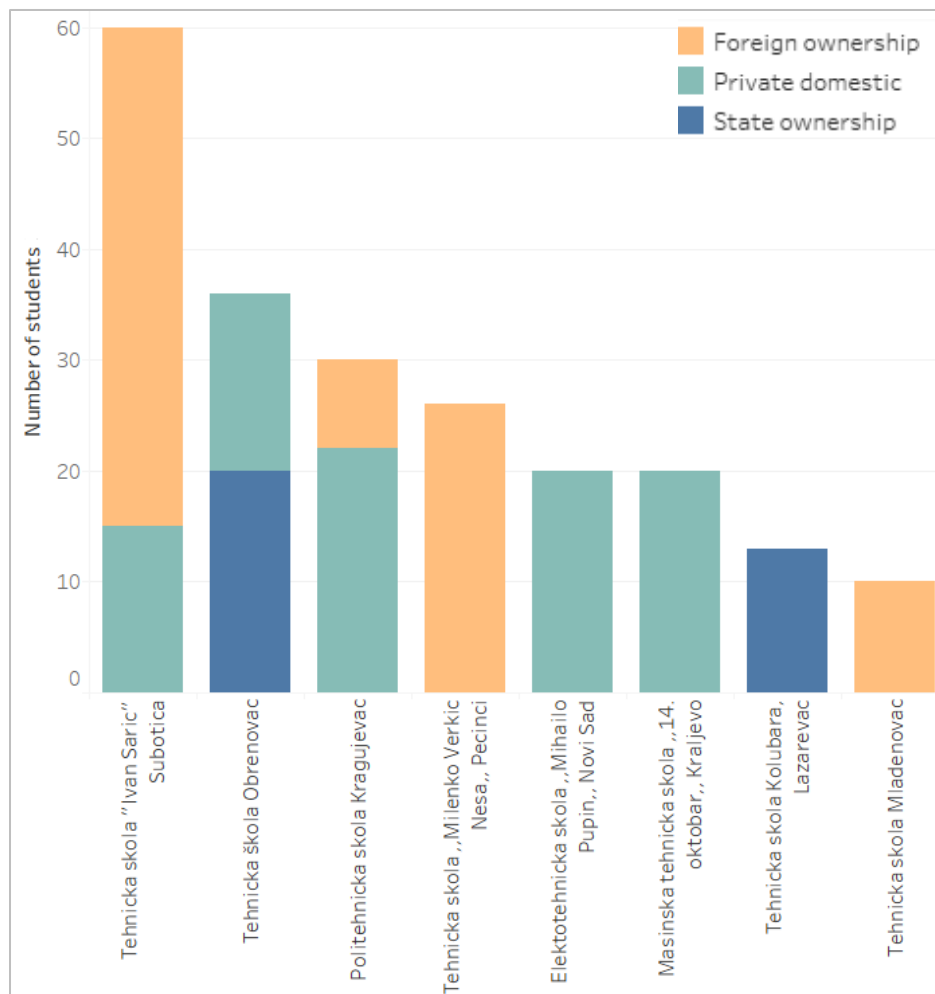
| Firm size | # students | # firms |
|-----------|------------|---------|
| Velike | 134 | 11 |
| Srednje | 61 | 11 |
| Male | 19 | 5 |
| Mikro | 1 | 1 |

Source: BRA, GIZ, Company surveys

The number of students is related to the company's capacity (size). Two thirds of students were selected in large firms, nearly a third of students were in middle-sized enterprises, while the residual was in small and micro companies.

The number of firms and students is not evenly distributed to regions. The graph 3 shows the number of students according to the regions and ownership of the companies.

Graph 3. The distribution of students by regions and company ownership



3. THE CONCEPT OF COOPERATIVE MODEL IN VOCATIONAL EDUCATION

3.1. Learning through work – The European context

Mid-level vocational education represents a particular form of mid-level education aiming to enable students to acquire competencies (knowledge, skills, capacity, attitudes) needed for employment and life-long learning as well as to advance their personal and career development. The students acquire general and expert knowledge through specialized schools and through practice in companies.

Changes in economic development paradigm, as well as a continuous change in labour markets' demand, required a need for mid-level vocational education to be reformed. The reforms in mid-level vocational education aim to establish a flexible system of both initial and continuous vocational education and training (VET), based on The Copenhagen Declaration⁵ (2002), The Bruges Communiqué⁶ (2010) and The Riga Conclusions⁷ (2015). The Riga Conclusions pertain to the role of vocational education and training in the context of European economic and social development, and promotion of all forms of work-based-learning (WBL) is among the five mid-term objectives set out in the Conclusions. Emphasis is put on apprenticeship, with the inclusion of social partners, companies, chambers of commerce, and institutions of vocational education and training.

WBL combines learning at school and learning at employer's premises, while the student's status may be twofold:

- s/he can have a status of an employee and be remunerated for the work, or
- s/he can be not-employed and not be remunerated for the work:

WBL can be organized within various models⁸:

- Model 1: the student is formally employed – through apprenticeship (in-company training). The best-known apprenticeship model is the *dual model*;
- Model 2: the student is formally a student while learning, and his/her work is paid for in part or fully. This model refers to **cooperative model**, internship, training etc.
- Model 3: WBL is carried out at school in a simulated work situation and environment – in virtual companies or real companies as their part;
- Model 4: the students visit companies and shadow the employees, with the principal purpose to learn about work, not to learn how to work.

⁵ <https://europass.cedefop.europa.eu/sites/default/files/copenhagen-en.pdf>

⁶ http://ec.europa.eu/dgs/education_culture/repository/education/policy/vocational-policy/doc/brugescom_en.pdf

⁷ http://ec.europa.eu/dgs/education_culture/repository/education/policy/vocational-policy/doc/2015-riga-conclusions_en.pdf

⁸ ETF (2014) Work-Based Learning, [http://www.etf.europa.eu/webatt.nsf/0/8EFD210012D6B04EC1257CE60042AB7E/\\$file/Work-based%20learning_Handbook.pdf](http://www.etf.europa.eu/webatt.nsf/0/8EFD210012D6B04EC1257CE60042AB7E/$file/Work-based%20learning_Handbook.pdf)

3.2. Cooperative model of vocational education in Serbia

Mid-level vocational education in Serbia

The system of vocational education in Serbia is predominantly a school type education i.e. theoretical education prevailing with a varying degree of practical training. When applied, the practical training takes place mainly in school workshops and laboratories. VET is carried out through 317 specialized schools covering 193 education profiles classified into 15 work sectors, and it lasts three or four years.

The school workshops in the specialized schools are equipped to a varying degree. Over the last 15 years about 150 vocational schools have been granted elements of modern equipment through different European and bilateral donation programmes and support projects (CARDS, IPA, GIZ and other). That enables the schools' staff to apply teaching through practice, but the level of equipment provided is far from enough for the schools to be fully equipped and thus able to apply modern curricula.

On the other hand, supply of various education profiles is often not adjusted regionally, i.e. there are regions with specialized training schools amid many high-quality companies where a relevant practical education could take place. This is one of the main reasons for the failure of Serbia's mid-level vocational education system to provide students with enough relevant and recognizable knowledge and skills, and to enable them to find employment sooner rather than later, to develop their careers, and to facilitate their mobility in the labour market.

The reform of mid-level vocational education has been launched in 2002 along the main European reform tendencies. The reform of vocational education in Serbia aims to develop education programmes/curricula based on skills' standardization, i.e. on the acquired competencies and on the results of learning; it aims for a higher share of practical education in the curricula; it aims to develop artisan education and a role for the employer in all phases of mid-level vocational education (planning, development and application). In the old, unreformed curricula the practical education was most often applied once or twice a week in 3-year education profiles, and once a week in the 4-year profiles.

The reform of mid-level vocational education was launched through curriculum reform and was initiated by the employers who took an active part in the process. The development of several new curricula was in part supported by international projects. Sixty such curricula had been introduced into Serbia's regular system of mid-level vocational education, following an evaluation after the pilot phase (4 to 7 years). From 2017 the system includes overall 68 education profiles based on skills' standardization, competences, and learning outcome. These profiles imply a higher volume of practical education, that takes place for most of the profiles in a real work environment at the employer's premises. Five of the profiles are applied according to the cooperative model: locksmith-welder, industrial mechanic, electrician, mechanic for motor vehicles and fashion tailor.

Cooperative education in Serbia

MPNTR and a German Corporation for International Cooperation (GIZ) have begun developing in 2003 the national model of cooperative model through “The reform of mid-level vocational education in Serbia”; a project that leaned on the experience of the dual education in Germany, Austria, and Switzerland adjusting it to Serbia's environment.

The cooperative model was introduced with the objective to generate skilled labour capable to meet the needs of metal and electrical sectors, and able to adjust quickly to a given production environment because they had been trained in the same or similar environment.

From the school year 2014/15, the cooperative model is applied based on new curricula for three 3-year education profiles: locksmith-welder, industrial mechanic and electrician; in 8 mid-level schools for vocational training and in 35 companies.

Key aspects of the cooperative model

- Conducted at schools and at the employer's premises;
- Practical education is conducted on the basis of the **contract on conducting practical education** concluded separately between the school and each of the employers;
- The employer **provides space, equipment, and means of production** pursuant to relevant laws and regulations;
- The employer ensures safe work environment at work place;
- **The school together with the employer plans** conducting the practical education;
- The practical education is conducted **at school** in the first grade/year and **at the employer's premises** in the second and third grade/year;
- **The instructor** is in charge of the students' training at the employer's premises after undergoing a special **training programme** for working with them;
- The student **does not have the status of an employee**;
- The student or parent/carer **may** conclude the contract with the employer;
- The employer **may** provide the student with a financial and material remuneration;
- The instructor takes part in the preparation and realization of the final exam as an **external member of the exam panel**;
- The employer **may** enter into a **public-private partnership with the school and the local government** in order to provide certain equipment and materials needed for realization of the practical education in the first grade in school workshops;
- The school ensures **a flexible organization of education** pursuant to the plan for realization of the practical education at the employer's premises;
- **The school** cooperates **with the instructor and parents** in order to advance the students' learning.

This model is applied only in environments where the need is identified for certain 3-year profiles and where schools and employers meet the requirements in respect of the teaching and learning logistics, the space, the equipment, and the engaged staff. On the basis of MPNTR's tender, schools were selected for the realization of programmes based on the cooperative model, and the selection identified the first three

classes of students. The schools were selected based on their statements of intention, and the forms completed by nearby companies and local governments.

3.3. Education profiles in the cooperative model

Teaching and learning through the cooperative model is realized in 5 education profiles: industrial technician, locksmith-welder, electrician, mechanic for motor vehicles and fashion tailor. The profiles implemented in the system since school year 2014/15 are: industrial mechanic, locksmith-welder, and electrician, and since 2017/18 also: mechanic for motor vehicles and fashion tailor.

Table 3: Review of education profiles according to the cooperative model

| School year | Work sector | Profile name | Number of classes that passed final exam |
|-------------|---|-----------------------------|--|
| 2014/2015 | Mechanical engineering and metal processing | Industrial mechanic | 2 |
| 2014/2015 | Mechanical engineering and metal processing | Locksmith-welder | 1 |
| 2014/2015 | Electrical engineering | Electrician | 1 |
| 2017/2018 | Mechanical engineering and metal processing | Mechanic for motor vehicles | / |
| 2017/2018 | Textile and leather | Fashion tailor | / |

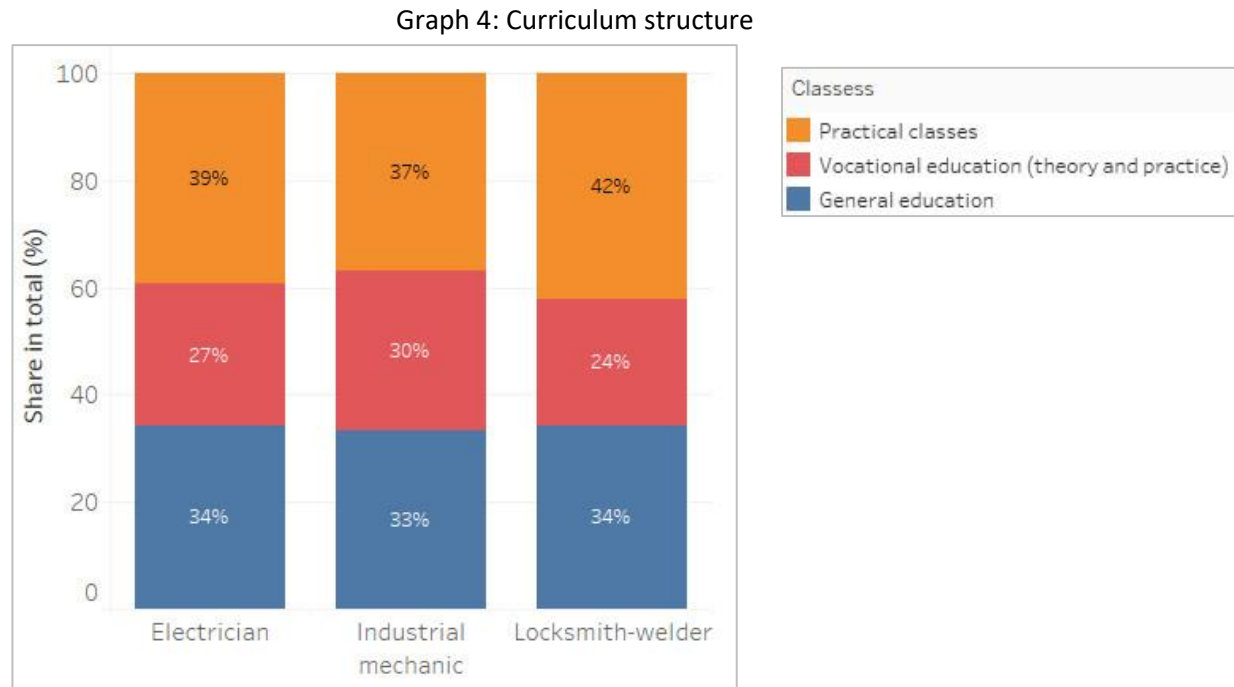
Fully new curricula and programmes have been developed for 4 profiles. For the fashion tailor only part of the curriculum was revised, that pertains to the practical education. This profile had gone through a pilot phase and following an evaluation it has been officially introduced in the system of mid-level vocational education in 2015/16 and is realized according to the cooperative model since 2017/18. This report focused on the following education profiles: industrial mechanic, locksmith-welder, and electrician and these profiles have been implemented in the system since 2014/15.

Education programmes/Curricula

The curricula are based on skills' standardization, competences, and learning outcome. The standard for any skill includes: description of work, learning objective and learning outcome, as well as ways to verify achievement levels for the learning outcome. The description of work is given in terms of expert competencies and units of competence. All the three profiles are on the level 3 in the national competence framework in Serbia.

The curricula are realized through general and special-knowledge subjects. General to expert education ratio is set by the Basis of Education System Law, for the three and four year education profiles. For the three-year profiles the ratio is 35% of general education subjects and 65% of special-knowledge subjects including the practical education.

Graph 4 shows curriculum structure for individual education profiles as per share of general and special-knowledge education (theory and exercise) and practical education.



3.4. Benefits expected from the cooperative model

Introduction of the cooperative model aims to achieve the following benefits:

- Shorter adjustment period for employees, because the students acquired skills in a real work environment;
- Availability of modern tools, machinery, and equipment in companies during the learning;
- Developing a responsible attitude to work and colleagues in a work environment;
- Introducing financial and material incentives for the students;
- Sharing responsibility between the school and the company for the realization of training;
- Establishing close cooperation between the school and the company in respect of the students' practice, but also in respect of developing the teachers for expert-knowledge subjects in the field of modern technologies;
- Public private partnership as a means to invest in education – providing equipment for mid-level vocational training schools, and school workshops in particular;
- Promotion of artisan-technician profiles that are in high demand on the labour market.

4. COOPERATIVE MODEL IN PRACTICE

Applying the cooperative model in practice corresponds mainly to what MPNTR intended to conduct as cooperation between the schools and the companies. The companies observed and applied the *operational* curriculum, provided mostly by the schools. However, such a curriculum covers a wider range of competences within an educational profile. Hence, the companies are sometimes not able to ensure the entire practical part of education at their premises. In such cases, the students perform part of the practical education within the school workshop. On the other hand, there are discrepancies between the levels of competence gained by students of the same profile in different companies. This is due to both the provided level of technological equipment and the company's attitude and its readiness to include the students in higher risk work (i.e. locksmith-welder).

Half of the companies already had an experience in applying practical education even before the cooperative model has been introduced. State-owned and formerly state-owned companies stand out in this regard, because of their long-standing tradition in cooperation with schools in applying the practical education/classes. Such companies tend to modify their method and scope of the practical education, in particular in case of the locksmith-welder profile, while the education of the electrician profile is still mainly applied as before. Another half of the companies (12 of them) have introduced the practical education in 2015 coinciding with the introduction of the cooperative model.

All the companies we interviewed have hosted an entire class of industrial mechanics, locksmiths-welders, and electricians and they cooperated with schools from the first grade of the class of 2015/16. “Robert Bosch” company from Šimanovci is an exception as it has hosted two classes of industrial mechanics. **All the companies have applied the planned curriculum in cooperation with the schools, and they have implemented the final exam.**

How did application of practical education in companies look like?

Within the cooperative model, during the 3-year vocational education, the school applies in full the curriculum during the first year, while a part of the practical education that is conducted at the company's premises is conducted as bloc of classes over a two-week period. During the second and third year, the entire practical education is conducted at the company's premises. During the second and third year, the practical education is conducted in companies respectively for two days a week and 3 days a week lasting six hours each day.

Exceptionally, some companies that admit students for the education profile of industrial mechanic, realize the practical education in blocs lasting 9-12 weeks, according to the «sandwich» model. Such companies are «Robert Bosch» and “Agena Technology” from Šimanovci, while “Siemens”, “Contitech Fluid Serbia” and “Grgo bravar” realize the classes observing a weekly time-table the same as for other profiles.

Most of the companies have met the time-frame implied in the cooperative model. This means the companies had the instructors at their disposal, tasked to deliver practical education over 2-3 days a week, six hours a day, to a planned number of students. However, this does not imply that the students attended

the practical education for the planned duration (we focus on the attendance issue in the chapter on students' performance). The only deviation from the planned duration was in Kraljevo, where students spent one day less than estimated at companies' premises (this means they spent one day and two days during the second and third year respectively on practical training at the company's premises and the rest of the time at school). Companies from Kraljevo emphasized the need for students' full attendance during the period planned by the curriculum, and that they were able to provide the environment required by the curricular demands (whole two and three days).

In addition, a part of the curriculum cannot be realized sometimes within a company because the company can't provide the required conditions. In such cases, the practical education is realized in school workshops when needed. We identified such cases most often in two education profiles:

- *Industrial mechanic* – This profile's curriculum includes both preventive and corrective maintenance of industrial machinery. This kind of training cannot be conducted in some of the big companies with CNC machinery due to the companies' potentially high costs. During the practical education at company's premises, the students cover a part of the curriculum pertaining to: technical-technological preparations for maintenance of industrial machinery; as well as to technical-technological preparation for machine treatment of simple parts (the machine treatment itself is not covered here, and neither is assembly of industrial machinery's substructures).
- *Electrician* – It is more difficult to conduct practical education for electricians due to safety concerns, and the fact that in most cases the host companies are huge production systems. Three companies are in question here: two of them are originally state-owned companies, “Kolubara” and “Energotehnika – Južna Bačka”, and one is foreign company “Robert Bosch”. In none of the three is it possible to apply parts of the curriculum pertaining to maintenance of industrial electrical equipment. Also, none of the three deals in repairing of small household appliances, and the companies point out that they must either buy such appliances (i.e. hair dryer, oven) or conduct that part of the practical education at schools.

Due to the above challenge, duration of the practical education was reduced by one day in six companies, and a part of practical education was conducted at three schools. Practical education for entire classes was organized in school workshops in Mladenovac and Kraljevo, while in Subotica that was only the case for students assigned to one company for their practical education (“Contitech Fluid Serbia”).

Realization of practical education in companies

The instructor, in cooperation with a teacher of practical education, is tasked with the realization of practical education. S/he organizes the practical education for each student, rotates the students to various positions pursuant to the plan for realization of practical education, and assigns the students to experienced technicians for work or in some cases s/he personally instructs the students. The instructor keeps track of the students' achievements and development throughout the practical education and partakes in their assessment together with a teacher of practical classes. The instructors were the company's employees, and in most cases they have undergone the instructor's training programme (16 of

them) organized by GIZ. They were in most cases in charge of communication with the school (that organizes the practical education, and with its teaching staff), in addition to coordinating and organizing the practical education classes at the company's premises.

In most cases, the instructors are not employed by the company specifically to coordinate the practical education at the firm, but also have their regular basic job. The time they spend on direct communication with the students ranges between 30-70% of their daily time. However, the instructors tasked with coordinating practical education in the company, are not the same people who directly train the students using machinery. Skilled technicians /craftsmen are in charge of this, as they already work with the machinery in production plants and they use a part of their working hours to work with the students.

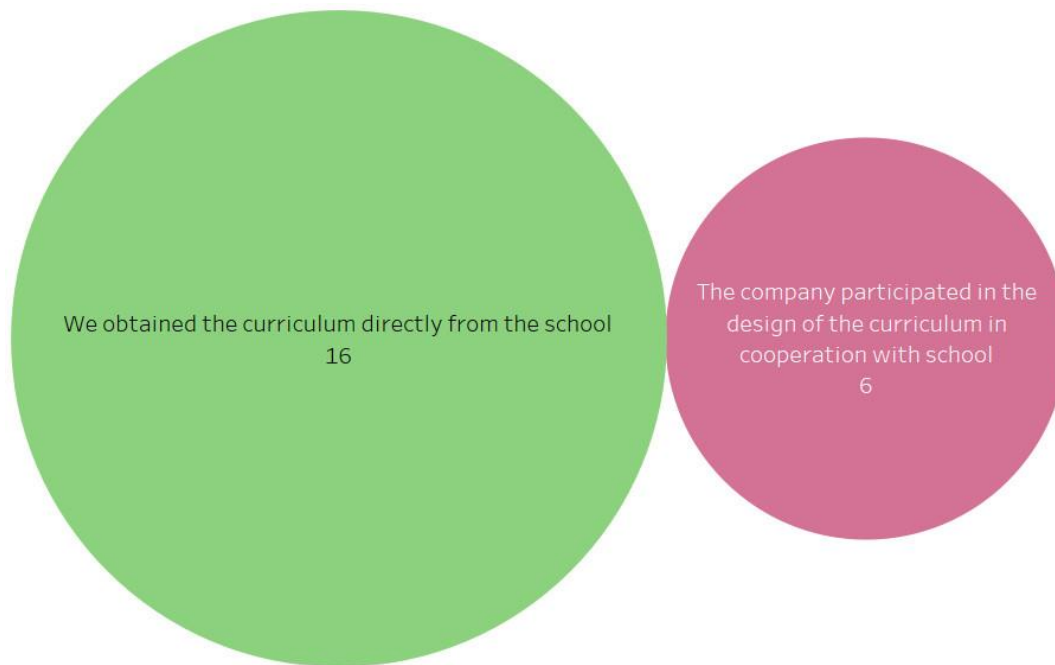
The companies most often emphasize (medium and large companies in particular) the need for a person whose full working hours are dedicated to working with the students. As thing are, the instructors tend to be forced to “steel part of their time” to be able to dedicate it to the students, due to huge scope of work in their “basic job”. The time they spend with the students is thus neither enough nor is it sufficiently directional.

Also, the companies emphasized the need for skilled technicians to undergo a instructor's training programme, in order to be engaged in working directly with the students. This is particularly important because the instructors need to understand a pedagogical approach to working with adolescents, different from working with interns who are usually older at the time they join a company. This leads to the problem of terminological discrepancy. A company's employee who spends less time with the students is often referred to as “the instructor”, so the companies suggested for such persons to become coordinators of practical education while the skilled technicians should become the instructors.

Curricula used in realization of practical education

Most of the companies are still in the process of establishing a kind of steady system of the implementation of practical education, while only very few companies have already established a defined and standardized system of the application. The teachers provide most companies with the general curriculum, and it is then adjusted to the company (operationalized). However, the degree of company's participation varies in drawing the operationalized plan and curriculum, between the companies and even more so between the schools. Also, the degree of their command of the curriculum varies, resulting in different assessments of: how adjusted the theoretical curriculum in schools is with real work tasks during the practical training at the company's premises. We may thus conclude that cooperation between schools and companies is not equally distributed. The curricula for practical classes were provided by the schools for most companies, while only a quarter of the companies participated in drawing the practical education curriculum in cooperation with the school, as shown in Graph 5.

Graph 5: Presentation of practical classes curriculum to companies (number of companies)

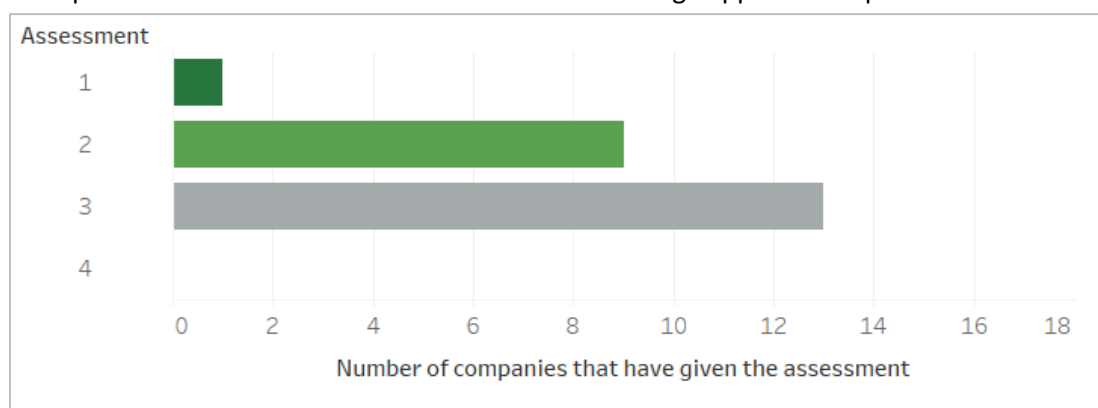


The situation is similar, in respect of the knowing/understanding by the companies of the entire curriculum for the education profile the cover. Seven companies were not given a presentation of the curriculum for the education profile conducted at their premises. They, instead, draw themselves a practical curriculum in line with their own technological process.

Harmonizing theoretical and practical education

The company makes an assessment whether a curriculum harmonized (and to what degree) the theory and a practice in particular company. Assessing levels of theoretical knowledge among the students attending the practical training, our interviewees ranked the levels as average but also told us that the students also advance their theoretical knowledge through practical work. In the cases of two educational profiles: locksmith-welder and industrial mechanic, the interviewees directed most of their criticism to the students' insufficient knowledge of technical drawing, mechanical components and materials. Large number of instructor in companies agrees that the theoretical knowledge acquired in school is not sufficient for the realization of practical classes (Graph 6).

Graph 6: Assessment of students' theoretical knowledge applicable in practical education



However, the companies pointed out that their answers represented only assessments, and that they often did not have an opportunity to acquire detailed knowledge of the curriculum. Hence, they are unable to assess if the students' low levels of theoretical knowledge resulted from the students' failure to learn it (although it was included in the curriculum) or from the fact that certain things were not included in the curriculum.

Forms of realization of practical education in companies

The practical education in companies begins with the students undergoing a safety training first, and they are given the safety gear. Then, the students are sent - either directly to production plants where they receive further training and where they observe the production process (like in the case of industrial mechanics who are placed from the outset in production halls) – or they spend some time first in workshops and specially equipped training centers (this is in particular the case with locksmiths-welders, and with companies that have special capacity for practical learning), and they are from there moved to production.

LBW consists of the following phases: familiarizing students with the production process, tools, machinery and apparatuses; observing the production process and skilled workers' demonstrations; performing simple tasks; and finally, independent work. Depending on the company, the students begin to work independently sooner or later. This is related first of all to the safety aspect of production, and large companies are particularly sensitive to safety. In smaller plants or workshops, the students are sooner presented with an opportunity to work independently. In many cases, the students never come to perform all the operations independently (this applies in particular to electricians and locksmiths-welders).

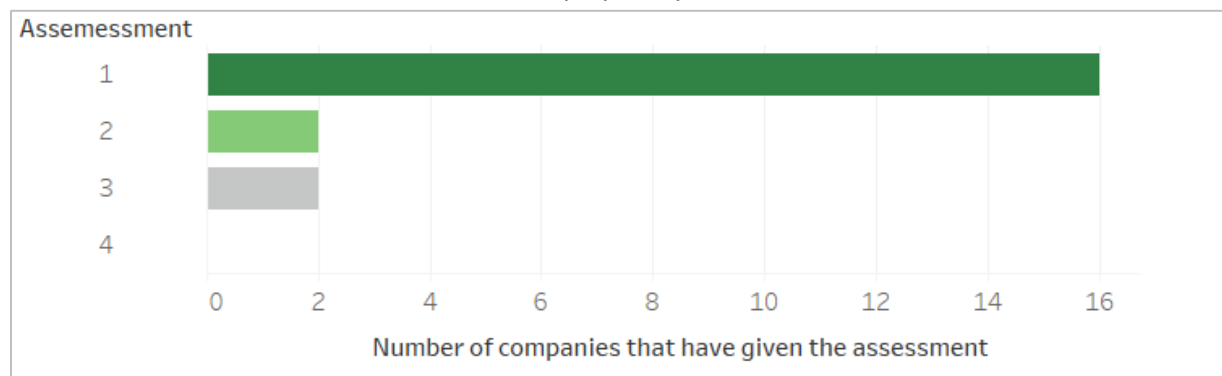
Students' inclusion in production process

While attending the practical education classes in companies, the students most often are neither included independently nor directly in the company's production process. As a rule, this may be seen better than elsewhere in cases of: locksmiths-welders and large-scale production; where all operations are performed «to the beat», i.e. where high efficiency is among the priorities.

The companies assessed as insufficient the students' competencies at the start of the practical education at their premises, and find reasons for that in the lack of equipment in school workshops. Hence, the students are only observers at first. In the case of profiles with higher probability of mistake and production of damaged products, like locksmiths-welders, longer period of time is needed before the students join the production process. Even then, they are given simpler tasks in order to avoid unjustified costs.

The companies point out most often that the practical education is not enough for the students to join the production process on equal footing with other company employees after they finish education. Some companies have their own training centers, and they think the students should train there after graduation, becoming thus better prepared to work in the company – although not fully prepared. **The instructors point out that the students need on the average half a year to one year of continuous training at company's premises, following their practical education, in order to be perceived as reliable beginners at work.** In «Siemens» we were told that 330 hours of welding is needed to train a student to MAG weld-type level, while skilled craftsmen at “Stelit 90” told us that their students need additional six months to a year after practice (depending on the individual in question) to acquire full command of the skill in the right way. To be recognized in a company as a good craftsman, beginners need 5 to 10 years of continuous work, according to the instructors' assessment. Nevertheless, the practical training increased significantly employability of students (graph 7).

Graph 7: Share of companies that assessed «The degree to which practical education upgraded students' employability»?



All the companies agree that students' practical education does not disturb the production process, and they see the main benefit of such education in the opportunity to train quality staff themselves and employ them later.

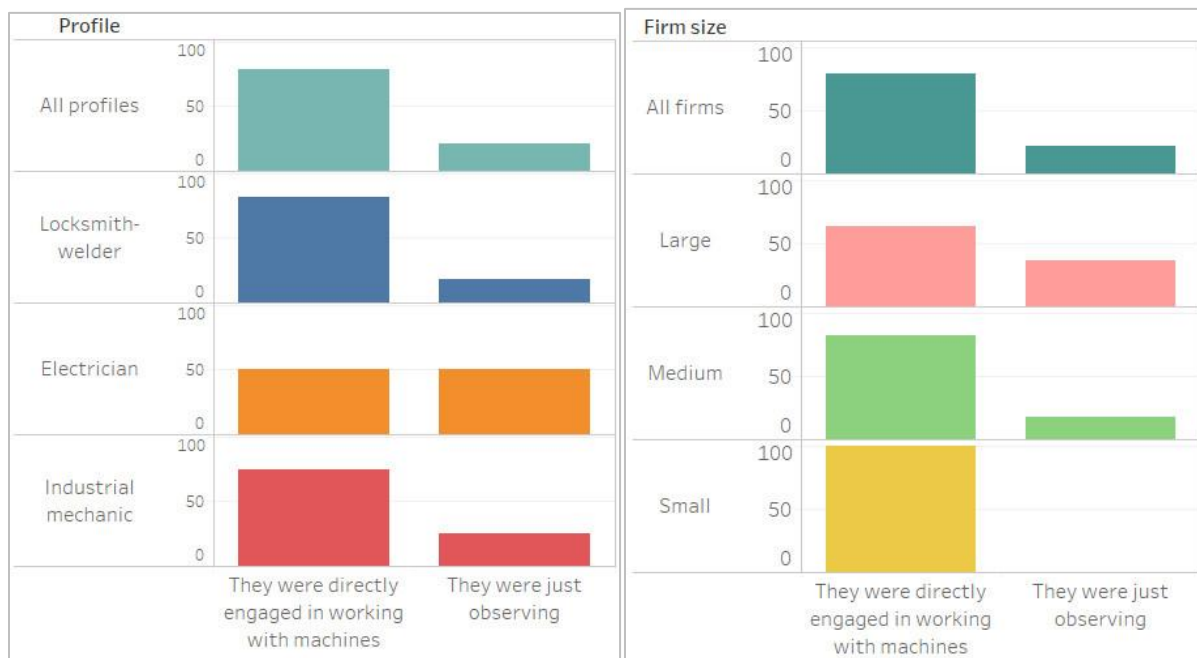
Practical learning on machines in production

Most of the firms (79%) point out that the students were included directly in work on the machinery. Only 21% of the companies told us that the students were not directly involved in operating the machinery but only shadowed the work process on certain machines. **However, when asked to describe the work process on certain machines they left us with the impression that the students most often assist in**

operating the machinery and stay short of operating them directly. In only few companies the students were fully involved in work on the machinery and were operating them independently.

The approach differs in particular for different education profiles. Complexity of the machinery as well as the adequate safety measures in the production environment, dictate the mode and time of the machine operation. The students usually perform preparatory work and assist the senior craftsman. In cases when they operate the machinery directly, they at first perform simpler tasks before moving on to more complex operations. The move to the final stage of training also depends on the interest each student has, and on the senior craftsman's willingness to give him/her a chance to work independently.

Graph 8. Students' inclusion in work with machinery, according to education profile and company size



Students' inclusion level in work with machinery varies with specific education profiles:

- Locksmith-welder:** The companies that admit students of this education profile demonstrated different approach, relative to the issue of safety at work. All the companies point it out as their primary concern. However, not all the companies opt to include students (nor to include them fully) in the act of welding itself. Those that decide to do so, take into the account the degree of training the students have completed already, in order to perform welding safely. On the other hand, certain number of companies provides the students with the opportunity to perform the act of welding, but only in an isolated and controlled environment, most often in workshops or specially equipped training centers. The problem here comes from the fact that this profile implies a higher risk, and the law on safety at work bars a person aged under 18 from engaging in the act of welding. Thus, larger companies more then the other, including even foreign companies, point out that they pay particular attention to the legal aspect in addition to observing the safety regulation.

The following is the prevailing pattern: during the second year of training the students become familiar with the basis of welding and they learn and perform all locksmith's tasks – such as preparatory work tasks, pulling down edges, interpreting drawings, cutting pipes to measure, brushing, assembly. During the third year the students experience the act of welding, sometimes at the beginning but more often during the final semester.

- **Industrial mechanic:** Unlike all other profiles, the practical education for industrial mechanics is realized throughout directly in the production process. Yet, the students' inclusion in the production process is limited by a high degree of automation, as the training of industrial mechanics is usually performed by technologically advanced companies. This implies the students of this profile most often assist the senior craftsmen who operate the advanced machinery. During the second year, supervised by the setter (a senior craftsman who sets the machine), the students learn the operational side of the work: how the machine operates, how does it function, how is it adjusted and the tools changed etc. During the third year, the students begin to adjust the machines and/or change tools when the machine is turned-off and there is no chance of injury. However, there was not a single firm where the students were involved (either individually or together with the senior craftsman) in programming or maintenance of CNC machines.
- **Electrician:** The most specific case in the practical education is the educational profile of electrician. The training is realized in big industrial systems where safety measures are highly developed. The students mostly perform practical work in special workshops, rather than directly in the production.

6. COMPANY SATISFACTION WITH COOPERATIVE MODEL

After the companies concluded the programme with the first generation of students in new educational profiles, they generally express satisfaction with the achieved results, and satisfaction with what the cooperative model provides to both companies and students. Irrespective of the costs of conducting practical training, companies see the benefits which exceed the expenditures. Their satisfaction mostly comes from the fact that practical training increased the employability of students after the completed education, and for the company it shortened the time necessary for inception training of new employees.

After the completed programme, the interviewed companies employed 35 students who fulfilled the standards of companies in which they attended in-company training. Companies assess that the students acquired two years of experience in a business industrial environment and became candidates to apply for jobs. Apart from relevant skills, they acquired the working culture, learned to respect the company work discipline and safety procedures. Companies emphasise that students achieved the basic level of competence. Experience gained through learning directly in the production process, knowledge of business relations within the company, respect of work discipline and occupational health and safety will result in decreasing the time needed for their full adaptation to the work process when they are employed. It is assessed that this time is reduced to one third which significantly reduces company expenditures when recruiting new employees.

At the beginning of the in-company training the companies faced the problem of insufficient motivation of students. However, over the two year period of working with the students, their motivation changed significantly. Practical worked led to higher motivation of students wishing to stay in the company as employee after the programme is over.

It is important to note that all companies agree that in-company training of students does not interfere with the production process. The presence of students has positive effects on the daily business process. Learning alongside masters, although they cannot replace them in their tasks, they help in preparation and auxiliary operations thus increasing productivity. Increased motivation of students and the achieved results are to a great degree the result of the manner of work and qualifications of instructors and masters with whom they are in contact during their in-company training.

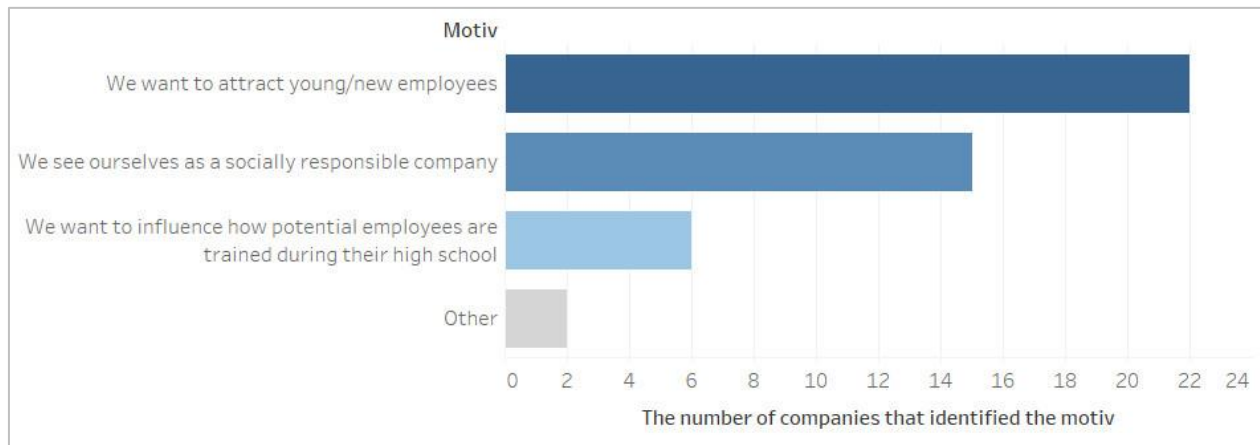
Companies are more satisfied with the new curricula. However, they think that the curricula are broader than the requirements of individual companies which can consequently conduct them to a greater or lesser degree. The degree of satisfaction with the curricula for educational profiles locksmiths-welders and industrial mechanic is greater than for electrician.

6.1. Motive to enter cooperative model of vocational education

The primary motive for companies to enter the cooperative model is to attract new labour pool, as they want to interest the youth in working in this sector. Today's system of education fails to answer to the needs for (high quality) labour at the mid-level of training. The above three education profiles stand out in this respect. Besides, with the generational “changing of the guards” some firms expect to lose part of their staff, including some of their most senior craftsmen. In the cooperative model, the companies see an

opportunity to find new staff, of good quality, enthusiastic, trained, and to enable the senior craftsmen to transfer their know-how to the new generation. And it is exactly that model that the firms use to open space for themselves to take part directly in the quality of the students' training during their education. Through the process of learning through practice, the companies hope to be able to have an impact on the quality of their future employees, i.e. to develop in their future staff the competencies needed for the companies' own production.

Graph 9. Company motive to enter cooperative model of vocational education*



*Company could choose all the answers about itself

Some of the companies point out as their prime motive the assertion that they are socially responsible and want to contribute to the quality of vocational education in Serbia by taking part in such education. They told us that the values of the cooperative model make an integral part of their business policy. They also often expressed their gratitude to the instructors for working with them at the beginning of their careers, and for providing them an opportunity to learn from the best. Now, they want to return to the society part of what they accomplished. Representatives of big foreign companies told us that their corporate global policy is to participate in this type of cooperation with schools and vocational practice, and that they follow the policy of their mother companies in this respect.

6.2. Benefit and cost of implementing cooperative model

For the companies, the major benefit from the cooperative model lies in the possibility of employing new young staff and preparing them well through vocational practice – i.e. provide them with the environment favorable for acquiring vocational competencies already during schooling period. One company's director told us that “if we manage to employ two out of ten students in the practical education scheme, we view as more than successful our participation in the cooperative model.” Besides, most companies included in the survey, view learning through practice as a chance to make an impact on tailoring their future employees according to their own requirements.

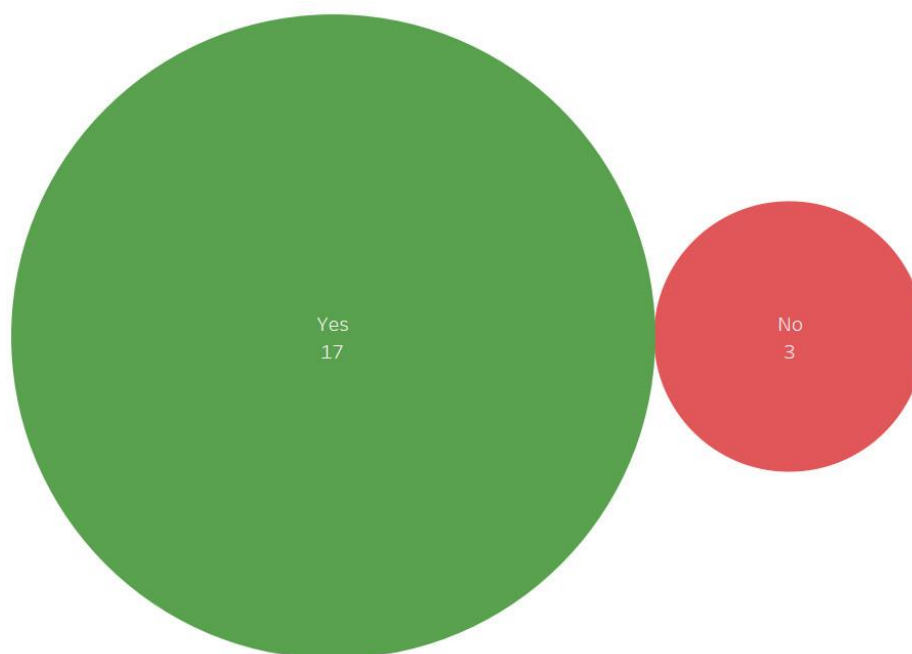
“Robert Bosch”, “Siemens”, and “Metal sistemi plus” have employed almost all the students who had undergone at their premises the learning-by-practice programme. The number of students who found

employment upon graduation is smaller in other companies. The firms told us that the students' readiness for work is higher than in case the staff came from the labour market, adding that the time to adjust to work is shorter due to the fact the students had become part of the company during the practical education already. Two years of practice in a renowned company makes a good CV reference. State-owned companies have longer standing tradition in the fields of practical education and cooperation with schools. They are, however, faced with a ban to employ the students and so they view their participation in the cooperative model as primarily a measure of their social responsibility. They told us that good students can eventually be hired through project contracts or short-term contracts following graduation.

It should be stressed that the most of the firms see no immediate benefit in the practical education classes at their premises. That is, the student who attends such education are teenagers with no work experience, and with no developed work habits and business responsibilities. In most of the cases, they can not be introduced directly in the production process because they may potentially damage a big part of the production. An exception are the firms with huge automation, where the students are included immediately in the production process. The students contribute to the company's productivity, more so during their third and final year of education. Product of their work is registered in some companies as part of production of the senior craftsmen who the students work with. The companies emphasized that the students' presence has a positive impact in respect of the company's work environment. However, even then the students are not substitutes for employed staff in all activities, but are only “assisting” the employees.

However, most of the companies emphasized that application of the vocational education and training at their premises brings more benefits than costs, in particular in the medium-term. (Graph 10). Many companies even speak of the marginal character of the cost of practical education at their premises.

Graph 10. Do benefits from adopting cooperative model top the (firms') costs?

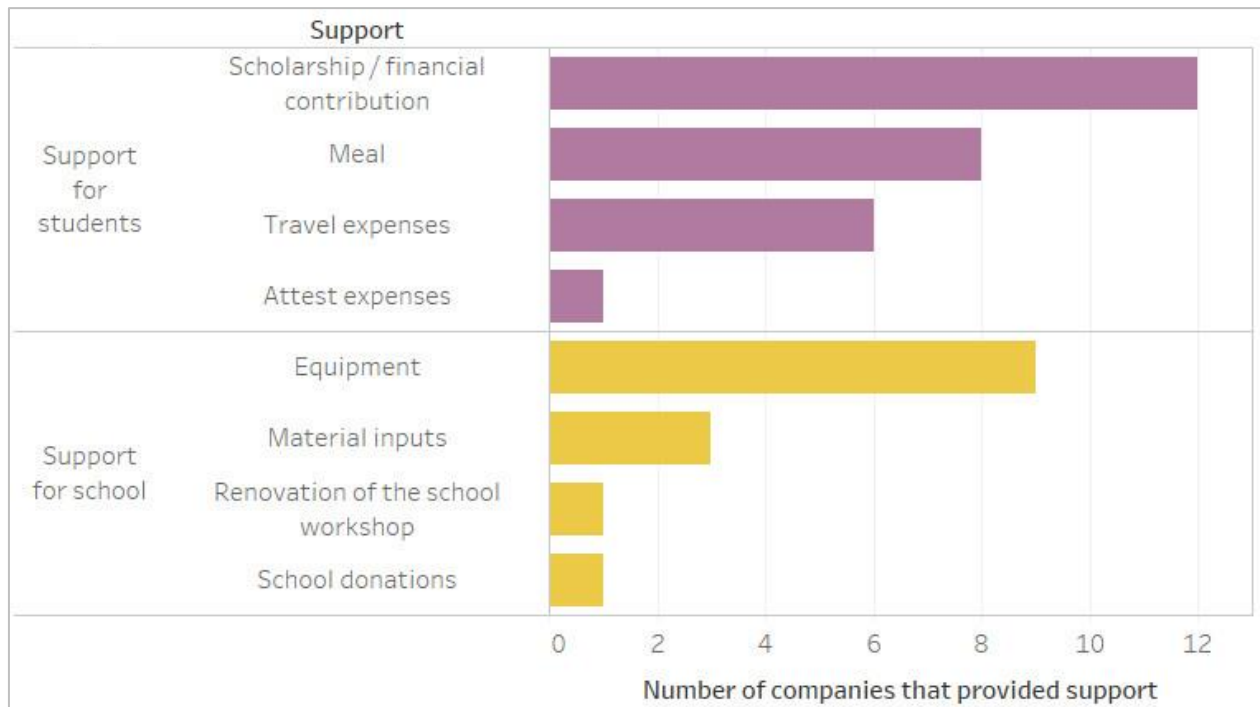


Very high costs of training new staff during their internship is mentioned in the public discourse as the reason for introduction of the cooperative i.e. dual education. The companies emphasize that the students acquire the required skills through learning in a real work environment, and also they develop a dedicated and responsible approach to work, prepare themselves for team work and to respect the company's hierarchy. Representative of one company stressed that, if a worker seeking to develop his/her skills needs 3 months to learn a new business segment, a student who completed training through practice would need less than a month to do so. This surely reduces his/her training time by more than three times. Other companies offered similar assessments.

Most of the companies do not keep (a detailed) record of all the costs related to the application of practical education. The companies that do so, mainly identify the cost of material (in cases of welding, finishing or making of products manually or on CNC machines), while fewer companies point out the time the instructor spends with the students. Even fewer companies added to the list the costs of machine/tools operation, if they are used outside the company's production process.

Save for the direct costs of applying the practical education at their premises, the companies were not expected to provide any kind of, either financial or non-financial, support for the students and/or the schools. However, a number of them offered to provide some support for the students and/or schools (Graph 11). Those companies (12 of them) provided in most cases a kind of stipend for students. Not all the companies offered such a support due to the lack of legal harmonization (c.f. chapter 6 below). In regions where many students lived in rural areas, with poor links to public transport, the companies provided or paid for the students' commute. On the other hand, the schools most often received support in the form of more modern equipment, to enable them to reflect better in their workshops the company's modern technological requirements; fewer companies provided donations, production material and the like. Also, a number of companies provided safety gear, clothes and shoes for the students.

Graph 11. Number of companies that provided support for schools/students*



*Each company could select all the answers related to it

Last but not least, some companies emphasized that they actually view as an investment all the expenses, mentioned usually as the costs. Thus, the companies secure supply of good quality and skilled staff, trained through the practical education and prepared for work conditions in the company. With this in mind, many companies invested separately to build training centers (workshops) within their premises (those related to the locksmith-welders), not to be used exclusively for the training of students but (possibly) also for the training of new employees.

6.3. Companies' satisfaction with different aspect

A. LEGISLATIVE FRAMEWORK

During the interviews the companies noted that irrespective of the fact that the introduction of the cooperative model is a good idea, the legislative framework is not sufficiently adjusted to fully enable it. The key weaknesses refer to the lack of harmonisation between the cooperative model and the Occupational Health and Safety Law and the Labour Law. Additionally, the companies noted inadequate regulations in the field of education, although they do not explicitly formulate this but it can be derived from certain comments.

Some examples of comments by company representatives:

- *“The Labour Law which will allow for unobstructed employment of minors.”*
- *“Another issue is the Occupational Health and Safety Law, which is being harmonised with EU directives, not allowing minors to engage in activities implying higher risks with potential negative health implications. Welding is one such example. Therefore there is lack of harmonisation between prescribed curricula and programmes for cooperative education and the legislative framework of Serbia. This law applies to children aged up to 18, and for certain higher risk job positions even up to 21 years of age.”*

The Occupational Health and Safety Law prescribes that persons aged up to 18 years (somewhere also up to 21) shall not perform activities implying higher risk lasting for full working hours. Namely, the Decree regulating dangerous work for children⁹ prescribes that they can spend from one fifth to one third of the monthly working hours stipulated for adults for the same type of work. The job position of locksmith-welder falls within this category of higher risk work, and some companies refuse to allow students directly to do the welding. Most companies point to great risks of being fined by labour inspection services if they fail to comply with these legal provisions. Representative of one company proposed that a support mechanism should be established for companies regarding the changes of regulations on working with hazardous substances:

- *“To assist companies to have a clear understanding of which regulations they need to comply with in terms of exposure to hazardous substances – the company uses a number of hazardous substances and must exercise caution, regulations in this field are important.”*

In the cooperative model the student is not an employee, and the financial remuneration that companies pay students is most often formally treated as scholarship fees because the **Labour Law** does not recognise the concept of compensation for work during students’ vocational education. Companies state the need to establish contractual relations with students or parents and guardians primarily in order to regulate the rights and obligations of pupils attending vocational education in order to promote accountable approach to work.

- *“Make amendments in the Labour Law – students’ job positions and the legal form of remuneration.”*
- *“Harmonise regulations – on meals during working hours, financial remuneration, and procurement of equipment. It is now up to the companies to decide what of these they want to provide. Also, it is necessary to adopt regulations regarding the number of students who will attend vocational education per unit of production.”*

Finally, since companies were interviewed before the **Law on Dual Education** was adopted, company representatives noted that it is necessary to harmonise the Law on The Education System and ensure a legal framework to specifically regulate technical in-company training. A consequence of absence of legal framework can result, as companies state, in the cooperative model being implemented arbitrarily in some aspects without sufficient harmonisation among companies in the same region, and among different companies. This refers to many aspects of the cooperative model: starting from how students are allocated

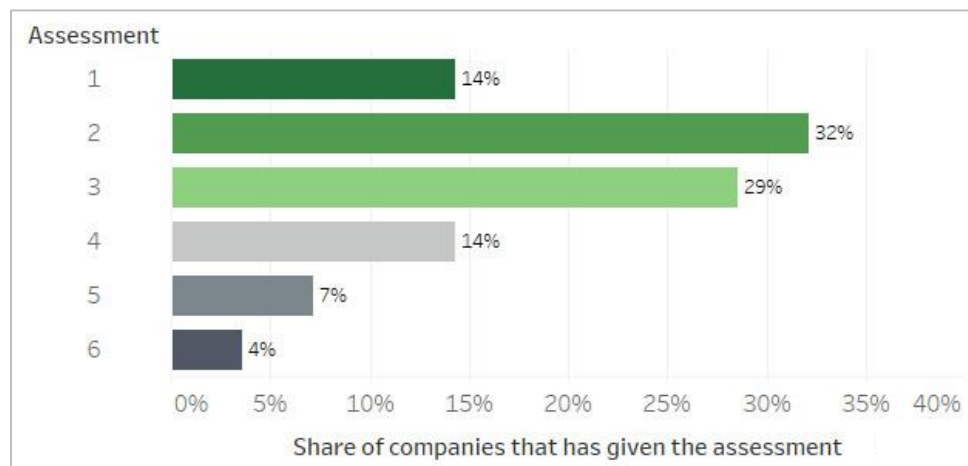
⁹ “Official Gazette RS”, No. 53/2017

to companies, how professors grade students, how the final exam is designed and conducted, which formal mechanisms exist in order to harmonise the curricula to the company needs, etc. These different aspects are discussed in more detail in the sections below.

B. MODERNISED EDUCATIONAL PROFILES

Most of the companies underline that the modernised profiles suits to their needs. Namely, 75% of the companies has given high assessment for the level to which modernised profiles suits to their needs (Graph 12). On the other hand, dissatisfaction with the educational profiles are related to the companies which undertake practical classes for the *electrician* profile. Namely, companies agree that this educational profile combines three different profiles, and thus is difficult to be implemented.

Graph 12. Assessment of the adequacy of modernized profiles to companies' needs



C. COOPERATION WITH SCHOOLS

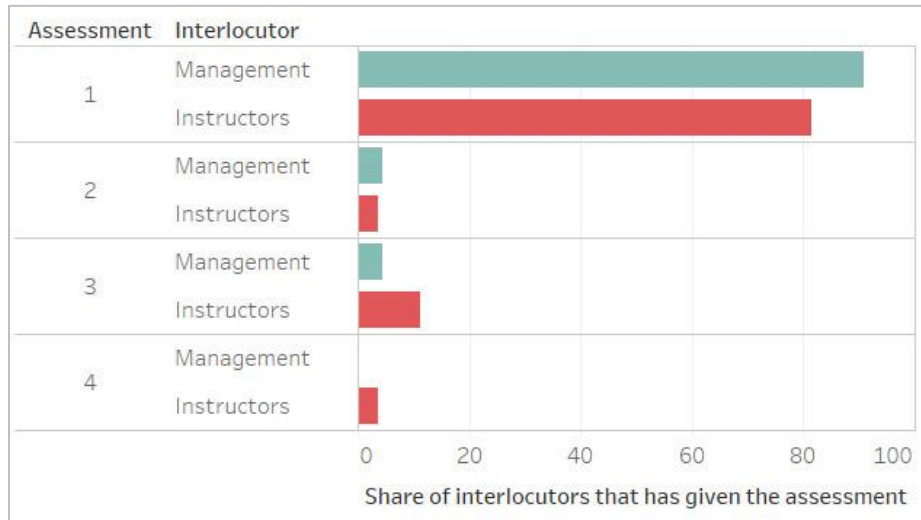
The cooperative model is based on cooperation between the secondary school and the company in the learning process. The companies are obliged to implement the vocational teaching according to programmes of education for the relevant educational profiles. Implementation of these programmes is adjusted to the requirements of each school and company. The schools sign contracts with companies on business-technical cooperation regulating issues relevant to implementing the in-company vocational teaching. These contracts are signed for a period of one academic year.

It should be noted that in the course of interviewing, a conclusion was made that successfully cooperation between schools and companies and successfully in-company training is more frequent in more developed regions than in others. These are the regions with high demand for labour, and where companies (in contrast to less developed regions) are willing and have the capacities to pay higher salaries to workers in the relevant profiles. Additionally, schools cooperate with companies to promote the educational profiles in demand, which further makes them more desired. The end result is that students in more developed regions show greater interest for three-year profiles, since they see the prospect of employment in relatively successful companies.

Communication with schools

The majority of companies evaluate cooperation with schools as satisfactory, and often excellent. When asked about the communication with schools, both the company management and instructors assess most schools with the highest mark (Graph 13).

Graph 13: Assessment of communication and cooperation with schools



The management of most companies evaluated communication and cooperation with schools as very successful, while some instructors rank this with lower marks (4 and 3). This difference is a result of the fact that the company management and instructors communicate with schools on different topics:

- **Management has a direct communication with school principals.**

There is communication between the company management and schools (most often the principals) but it is not as frequent. It is mostly related to some strategic issues: plans for the future, possible improvements in vocational in-company training and preparations of the students for such training, plans for selection of topics and organisation of final examinations. Since this form of communication is not very frequent, especially in some regions, the management of certain companies answered this question by stating the topics that the instructors discuss with school representatives.

- **Instructors communicate with the school vocational training coordinators.**

Instructors also assess this communication as excellent or good. Yet, like in the case of the preceding question, the instructors give a higher assessment mark than can be concluded from the detailed answer which follows. With the exceptions of companies in Subotica and Kragujevac, where instructors are exceptionally satisfied with the cooperation, in other regions companies expressed some degree or form of dissatisfaction or divided opinion.

Instructors base their assessment on communication and cooperation with staff in charge of organising vocational training and teachers. The communication between the instructor and the school is most often related to monitoring students' regular attendance and discipline, as well as their progress. At the same time, companies state that this is not sufficient and that there is need

to intensify cooperation on how to promote the interest of students and their commitment, because the companies believe that the schools should have a greater role in this. There are significant differences in how different schools are assessed by their partner companies.

Some quotes:

- *“We are especially satisfied with the cooperation between the school (head class teacher) and instructors. Instructors know that they can at any time contact the class teacher and/or anyone else in the school. In contact with them the instructors can deal with any current doubts or problems, relevant to regular attendance by students, safety, or any other issue regarding discipline.”*
- *“Communication is excellent and regular, professors come to visit at least once a week.”*

On the other hand, the cooperation with the school in Kraljevo is assessed by two companies (of the total four that the school cooperates with) as unsatisfactory.

- *“At the beginning of the school year the school sent the students. Intermittently the professors would call by the phone to hear about the regular attendance by students. At the end of the school year, there was no appraisal of results, nor did they participate in the final examination – the company just filled in the lists including a column with proposed mark for vocational training and sent the lists to the school. Insufficient pro-activeness and engagement on the side of the school – the company did not receive the operational plan of work with students. Additionally, the students last year proved to be very irregular in attendance and not motivated (with the exception of 2-3 individuals). Therefore, the role of the school should be to motivate the students and also to be engaged in joint progress evaluation with the company.”*
- *“The cooperation is formal, far from being a substantive plan for progress of the overall process.”*

The situation is similar in case of the school in Pećinci, where one company perceives the cooperation as excellent, while the other sees it as hardly satisfactory.

Commitment of school representatives to the quality of vocational training conducted

School representatives are mostly focused on monitoring the regular attendance by students, their progress in learning, and dealing with certain disciplinary problems with the engagement of the company, the students and their parents/guardians. Only few schools raise this cooperation to a higher level of organising and planning or evaluation of vocational training. The survey does not show if the schools used the opportunity for professional development of their teachers in the fields of technologies used in partner companies in order to improve the vocational training component which is conducted in school workshops.

Successfully examples of cooperation between schools and companies

Although most of the schools, as stated by companies, invest great efforts to establish successful cooperation with them, there are some that stand out as best examples. This is true mostly of two regions: Subotica and Kragujevac, where cooperation between schools and companies happens at the highest level with the use of all available mechanisms to improve the in-company vocational training.

- **Technical School "Ivan Sarić" Subotica**

All interviewed companies in Subotica assessed their cooperation with the Technical School "Ivan Sarić" as "excellent". The school has a solid system developed for coordination of in-company vocational training with companies, through which this cooperation is formalised, and the school is also developing mechanisms whereby both the cooperation and the in-company vocational training can be improved. Every year, the school renews the contract on organisation of vocational training through cooperation between the school and the companies. This contract includes provisions on: students' insurance (the school insures the students), the company ensures personal protection of students, and each company received inputs for organisation of vocational training according to a defined time-frame and work plan. Apart from model provisions, there is a provision stating that the company can sign contract for paying scholarship fees to students. This resolved the issue of lawful payments to pupils.

The school insists on monitoring the training curriculum and program, the acquiring of competences to be developed each month. The school has introduced the maintaining of *logs of vocational training* consisting of two parts – one part filled by the student, the other by the instructor. When assessing the performance of students the vocational training teacher takes into consideration the mark assigned by the instructor and decides the final mark for the student. Since students conduct the vocational training directly with company workers, not one but a number of them because they are rotated between different functions and departments in companies, instructors talk with these workers and learn about the actual results by students and their commitment to training.

In case when some companies are not able to conduct certain parts of the training in their company, the schools takes these parts upon itself. In such cases, the students attend one day a week of vocational education in the school workshop.

The school maintains continued communication with companies to identify areas where improvements can be made through the cooperative model. This year, the school established the *team for organisation of vocational training* which is in charge to work intensively with both students and companies. Nevertheless, the school principal states that curricula and programs cannot be changes in the short-term, especially not during a school year. Although companies often state that programs need adjustments, this is not fully possible because the students at final examinations must pass all components prescribed for the final examination. On the other hand, school representatives state that changes in curricula require time due to communication with the Ministry of Education, Science and Technological Development, and the time that it takes for the ministry to respond to school proposals and letters.

Selecting companies for in-company vocational training

There is no one uniform method of how students are distributed by companies at the end of the first grade. Each region, and each secondary school, has established its own system. Somewhere this system is made in cooperation with the schools, while somewhere it is arbitrary without a clear system. **In both cases, companies state that it is very important to have a clear, transparent, and fair system in place for distribution of students to companies.** All companies have the ambition to have the best students for their in-company training, since this raises the chances of these students would afterwards decide to work in these companies. Even if they do not get the most talented students, companies would like to know the decision-making criteria. If they knew the criteria, they could in the coming years improve the conditions based on these criteria to attract the better students. Below are two examples of distributing students to companies in which they will attend the in-company vocational training:

- **Technical School “Ivan Sarić” in Subotica has a fully defined and transparent system for distribution of students to companies.**

The system is based on coupling the ambitions of students with the company criteria. Firstly, students at the end of the first grade, before starting the second year, fill in the lists of ambitions. Namely, they rank the companies in which they would prefer to attend the in-company training. At the end of August, these lists are sent to companies, along with data on these students – marks and results during the first year. Some days after these lists are sent to companies, the school organises the “companies day”. Each company is allocated one classroom (last year this meant 10 companies). In the course of the day the students talk with company representatives in charge of human resources management. Thus, the student, depending on his/her preferences, goes from one company to another to talk with all companies.

After this, all companies and the coordinator for in-company training have a closed meeting for selection of students. The coordinator asks regarding each student the company that is ranked first by the student if it is willing to take this student for in-company training. If not, the coordinator asks the same question to other companies as they are ranked on the list. The companies select the student's in this manner every school year.

- **Technical School “Milenko Verkić Neša” in Pećinci does not have a fully transparent system for distribution of students for in-company training.** It seems that it is first the company “Robert Bosch” which selects the 20 students (10 students of industrial mechanic profile, and 10 students of electrician profile) to attend in-company training in this company. The students do two entry tests: one in theoretical knowledge and the other in form of interview. During the interview it seemed that students actually want to do the in-company training specifically with the company “Robert Bosch”, since they perceive it as a desired employer. However, representatives of the company “Agena Technoogy” state that in this manner the best students are recruited by “Robert Bosch”, while other less successful students are distributed among other companies. Representatives of this company state that for this reason there is a need to build a transparent and fair system.

The comparison of the model of cooperation between schools and companies in different regions indicated that in more successful regions, and in regions where there is close cooperation between schools and companies, a certain competition has developed among companies to attract students. Representatives of some companies even stated that „**the healthiest environment for the cooperative model would be the one in which both students and companies would “compete”: the student to compete among themselves to be allocated to their desired companies, and the companies to compete among themselves to attract the most talented/most successful students**“. Some companies even stated that they would like, after the final examination, for „their students to be lined up against other students“, to see how successful the companies are in transferring competences for the specific educational profile to the students. This was stated especially by companies which recruit students trained for locksmiths-welders, where there is a major difference in the level of acquired competences in different companies.

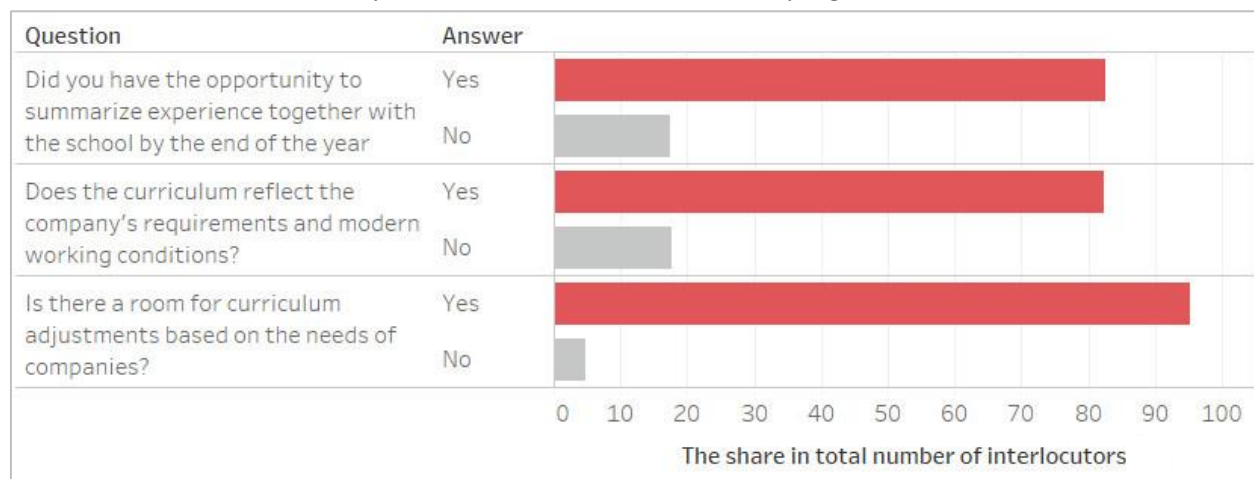
Companies are making reference to the dual education system in Germany where students first select the company, sign the relevant contract, and only then enroll in the relevant school. They believe that in that way they would ensure better motivated students.

Finally, selection of students is not always based on previous results but also the motivation of the instructor in the company to offer an additional opportunity to students not performing as well to demonstrated their potential. Some companies stated that success in theoretical subjects need not be directly correlated to success in the vocational part of the training. There were examples where less successful students proved to be significantly more talented and therefore interested in the job – this is true in case of welding where a specific set of skills is required (accuracy, peacefulness, creativity, etc.).

End of the year joint evaluation of practical training

With respect to summarizing experiences with practical training, 19 companies state that they had participated in this type of evaluation of practical training at the end of the year with the school. Yet, when asked to describe this exchange of experiences with the school and whether it was in some way formalized – companies state that this is mostly an oral exchange of impressions. Namely, schools in the majority of cases do not organize individual or group meeting with companies to systematically collect experiences from companies. Almost all companies stated that this form of cooperation with the schools and other participating companies would be useful in order to improve the in-company training. They are proposing that these meeting should be in some way formalized and should include all companies that the school cooperates with in order to exchange experiences and identify common solutions for problems which they face.

Graph 14. The opportunity for summarising of experiences from in-company training and the consequent improvements of the curriculum and programme



The school “Politehnička škola” in Kragujevac, apart from daily communication with instructors, also organizes quarterly meetings with companies, to exchange experiences and for the school to understand how it can contribute to improving the vocational training or preparations for it.

“Last year the school initiated a number of meeting aimed at harmonizing and improving certain skills. This will be implemented as of the next year. This was organized by the school and the Development Business Centre.”

Changes and improvements of the cooperative model from the perspective of companies

Certain companies put forward suggestions for improvement of the curriculum and the final examination. These companies most often contact the schools expecting them to pass on these suggestions to the relevant institutions. With respect to system changes one company contacted the regional chamber of commerce with suggestions to redefine the time the students spend in school and in the company.

- *“We made suggestions regarding all that we noticed. There is room to improve the curriculum and programme to better suit the company needs. We are offering support that the school needs – we have made donations of certain equipment (old welding devices), material, etc.”*
- *“The programme that the company proposed was not fully adopted – in terms of being ut in practice and theoretical education.”*

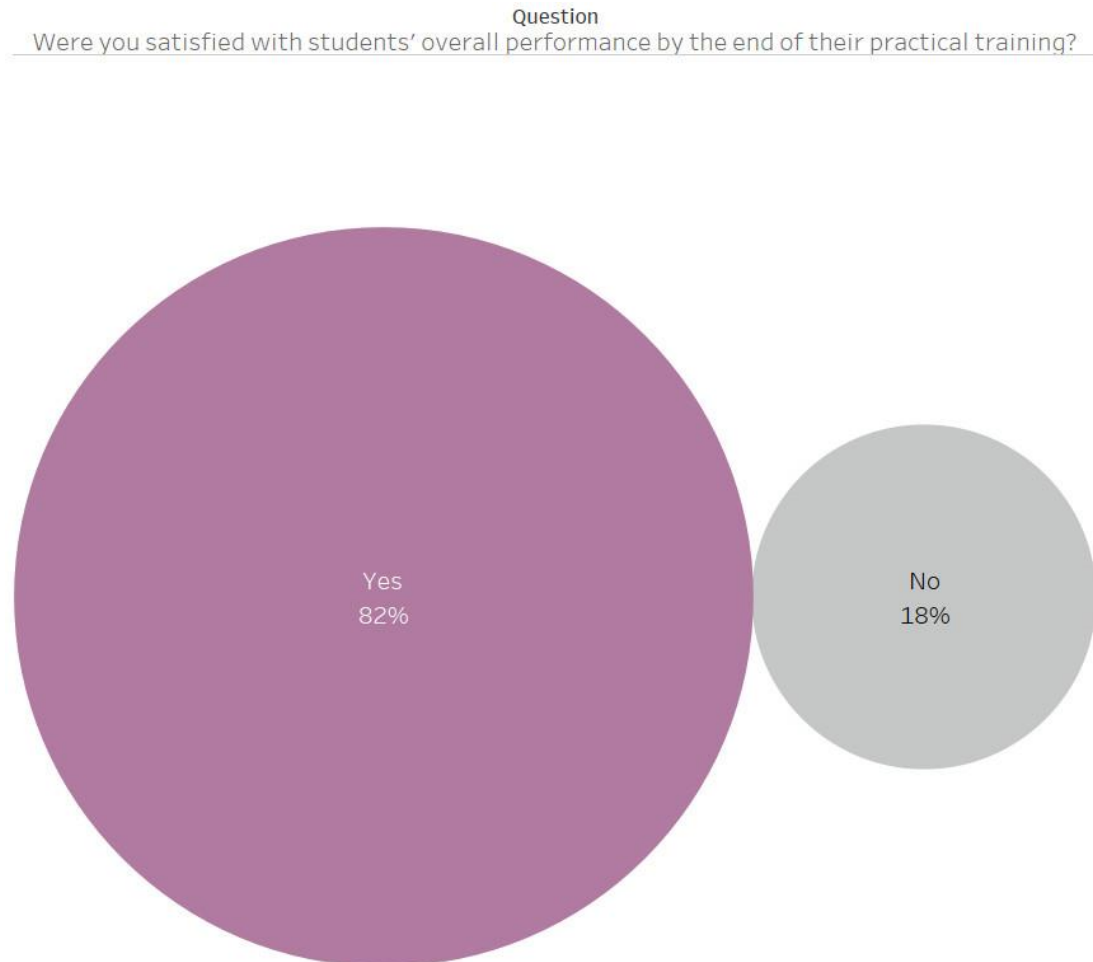
Companies sometimes take a pro-active role to improve the practical training. One of these companies is “Bosch”, which has undertaken a series of activities in order to improve not only the in-company technical training, but also the theoretical education. An example of this is the knowledge of basic and technical English language. Since the management of the company consists of foreign citizens, who have the interest to work with the students („they are earning our pensions“, says one of the managers), they often have a problem that they cannot talk to them due to students absent or poor proficiency in English. For this reason, the school now has an adjusted programme for the English language. Additionally, company

representatives periodically visit school classes and deliver thematic presentations aimed at raising the interest of students for certain topics and in order to increase their knowledge concerning innovative aspects of their educational profiles.

D. STUDENTS' PERFORMANCE

At the end of the education of the whole generation for all three educational profiles, companies assess satisfaction with the results achieved by students. The question *“were you satisfied with the overall performance by students at the end of their vocational training”* was asked of instructors, who were in more direct communication with the students than the management. Of the total number of companies, instructors in 86% of companies are satisfied with the overall performance of the in-company training relative to incoming performance and motivation.

Graph 15: Satisfaction of instructors with students' performance at the end of vocational education



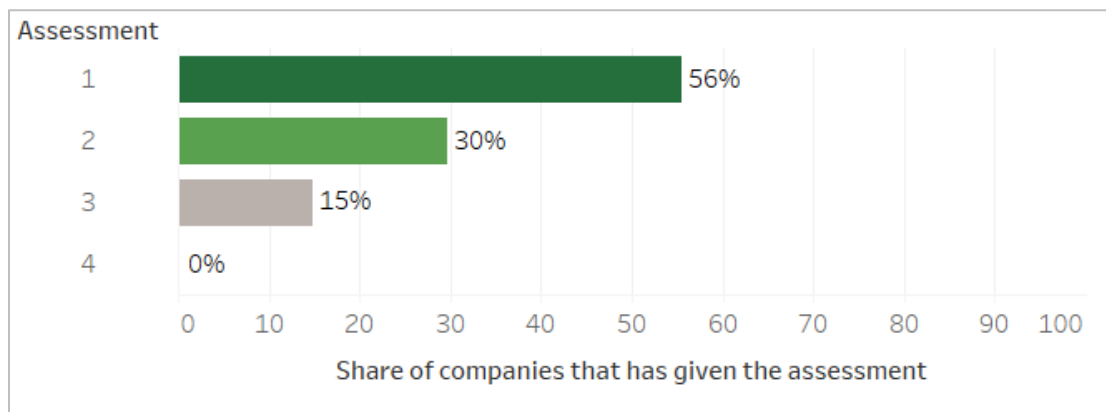
Satisfaction of instructors with students' performance is most directly related to the fact that the students have mastered the basic competences planned for their educational profile. Almost all instructors state

their satisfaction that the in-company training was conducted successfully and safely. Students acquired the basics for the relevant jobs, as preparation for their work in the company. This foundation is helpful in shortening and making more successfully the inception training that they would anyway need to attend in the company. Instructors state that they are especially satisfied with the results of those students who showed great interest. They had the opportunity to learn a lot, because they had the trust of the instructors and worked closely with them during the in-company training.

- *“We are very satisfied with the progress made by students and the interest and motivation that they demonstrated.”*
- *“Yes, certainly. Everything that the company wanted and aimed for at the beginning has been achieved. It is, of course, very important to understand that satisfaction with students is an individual thing (depends on the student).”*

Instructors think that the practical in-company training contributed significantly to students’ performance, although not all instructors were giving the highest marks. Namely, instructors who ranked this aspect with 2 (graph 16), state that apart from the quality of the in-company training, the final results by students are influenced by a number of equally important factors (and other companies mostly agree with this). The key influencing factors are: student’s motivation for the job, and thus for the in-company training; student’s commitment to in-company training; but also their talent for the relevant job.

Graph 16. Assessment of contribution of practical training to overall students’ performance



Instructors in five companies are dissatisfied with results achieved by students: “Radijator inženjering”, “Amiga”, “Agena Technology”, “Energotehnika – Južna Bačka” and “RB Kolubara”. The dissatisfaction for these companies results from the very low attendance (companies from Kraljevo), low motivation of students (all companies) and students’ very low level of theoretical knowledge (“Energotehnika – Južna Bačka” i “RB Kolubara”). Especially dissatisfied with the results are representatives of company “Energotehnika - Južna Bačka”, where of the three final examinations hailed only 5 students (of the total 20) passed the examination and received the diploma of electrician.

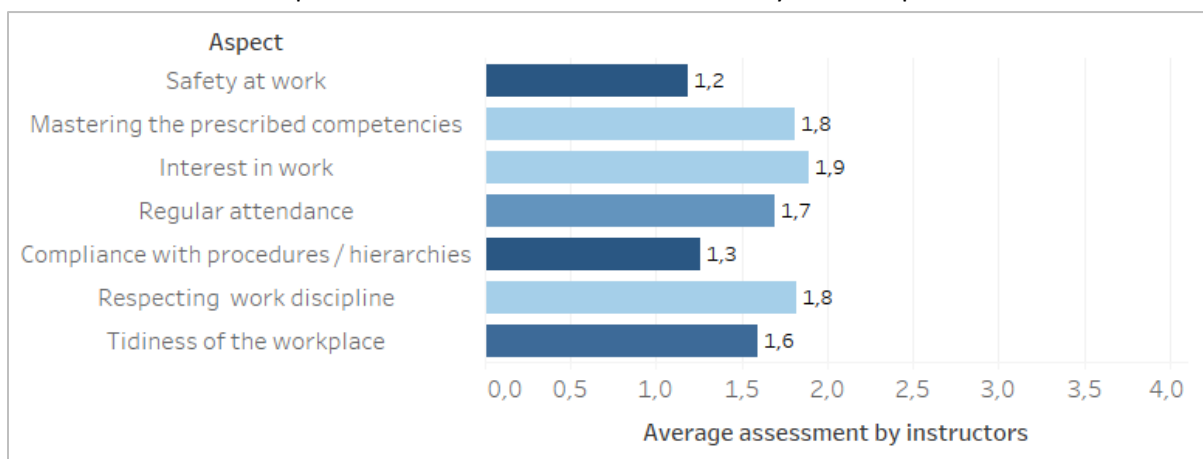
- *“We are satisfied with those students who successfully passed the examination and who were motivated. The company nevertheless managed to bring the programme with all students to the end. If speaking in averages – the statistics are devastating.”*

- *“Near the end of the year some of the students increased their interest. But the last year’s generation was below the expectations – it is difficult to work with unmotivated students.”*

Aspects of in-company training which had an impact on students’ performance

One of the key results of in-company training was the opportunity for students to work in real working environment. Apart from qualifying them to perform similar technical jobs, this was an opportunity for young people to learn about a responsible approach to work, respecting work discipline, apply safety and health measures, understand the business relationships within the company, participate in team work together with masters and instructors. Almost all companies state that an important aspect of learning was for students to understand what it is to be a part of a system. Through this practice they became part of the company and they understand relationships within it, thus contributing to respecting procedures and hierarchy, regular attendance and respect of the work discipline. Students respect the existing discipline equally as regular workers. They learned to be part of a team, they learn how to work without causing delays in the process, and how important their role and contribution to the process is. Through their approach the masters and instructors, not only as trainers but also as educators, contribute to the students acquiring the skills and also maturing as persons.

Graph 17: Assessment of students’ results by stated aspects



All the above aspects were assessed by instructors with the highest ranks, with all average rankings (corrected by number of students per school) are higher than 2 (graph 17). One of the requirements is the respect of safety and protection measures because it is clear that the companies are under great pressure due to the fact that the students are working in job positions with increased safety risks. Companies ranked this with highest ranks, and stated that “without respecting these measures the students would not be able to be part of the in-company training in their company”. The situation is similar also in other aspects, where instructors state that students are very well-mannered, they respect the company internal rules, and fit in well with the other employees. In contrast to this, the regularity of attendance was assessed differently depending on the region. Companies from Kraljevo and Lazarevac underlined irregular attendance as a key problem. Namely, students do not show responsibility with respect to the specified time for in-company training, and the schools do not sanction this. It happens that the students would come to the company for only an hour or two, just to be recorded as present, and soon leave. Companies

regularly report to schools on attendance (all interviewed companies), and state their dissatisfaction directly in speaking with the school practical training coordinators. Yet, the companies state that schools have not demonstrated much commitment to resolving this issue or did not have sufficient influence to do so. As for acquiring skills, instructors assess that by learning by doing has already led to reduced average duration of internships.

Students' motivation

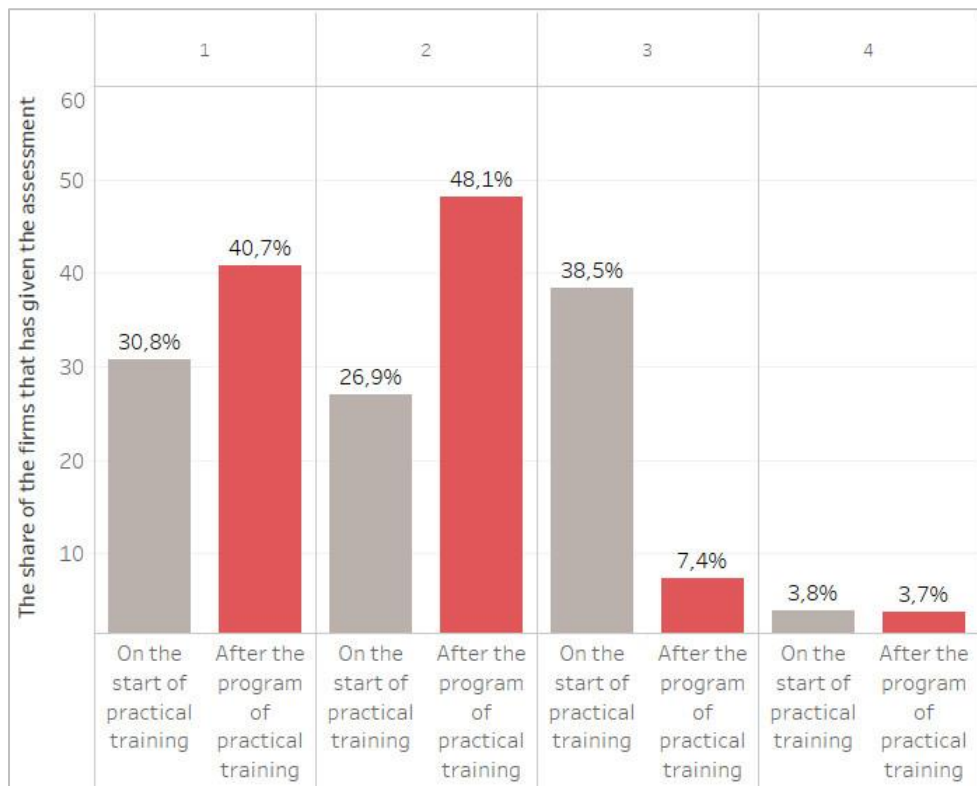
One of the key factors influencing the overall performance by students is their general motivation during in-company training. This includes motivation/interest for the job itself, and the wish to stay in that job position after the education is completed. Namely, the students enroll for this educational profile for different reasons and different motivation. The most frequent motivation is that education for certain educational profiles significantly impacts their chances for employment, while in some educational profiles (locksmith-welder) there is also opportunity for good earnings. Students enrolling for these educational profiles show considerably higher interest and commitment during practical training, and they state that they wish to find employment in that profile. There is a great demand in the market for locksmiths-welders, and the companies state that they are continually “moving from one company to another – companies literally steal them”, and there are no unemployed locksmiths. Still, some students in these three educational profiles, as the instructors state, enroll in these profiles “only in order to get a diploma”. They say that often these are the worst primary school pupils who could not enroll in the school which they wanted (nor anything else). An important motivation also comes from the parents, especially if the parents are of the same profession. The instructors state that some of the students, as they were growing up, saw their fathers and relatives work with welding equipment in family workshops, and thus became interested in the profession. These students enrolled for these educational profiles intending to pursue this specific profession (and they right away got jobs in one of the companies).

Assessments by instructors indicate that the majority of students are motivated to work and are committed to the practice. Yet, it should be noted that these are average assessments for the whole groups of students who attended in-company training. All instructors agree that in each generation of students there is always one very motivated student (or two, at best), while others are generally not motivated for practical training. Companies had a special approach to these exceptional students – gave them more assignments, trusted them with more difficult operations, because during the in-company training they gained trust in them. Since these are usually tasks involving a certain level of risk (especially for locksmith-welder) or potentially high costs in case of error (for example, industrial mechanics), instructors could not trust these tasks to all students, but only those who acquired the necessary experience. This is an example from one company: “While one student was following the master and closely watching and learning every move, other students were standing idly, looking at their phones”. Due to these exceptional students the companies raised higher the average assessment.

At the same time, the motivation increased for all students as the in-company training progressed. Measured as average rank on the scale from 1 to 4, it increased from initial 2.1 to 1.6 at the end. This can be seen in graph 18 – where 38.5% of instructors assessed the motivation of students at the beginning with 3, and this percentage of rank 3 decreased to 7.4% at the end of the in-company training. On the

basis of answers provided by individual companies there is consensus that the greatest challenge is how to motivate the unmotivated students (more than how to sustain the motivation of those who already are motivated). Namely, all companies which initially at the beginning of in-company training ranked students' motivation with 2 or 1, maintained these rankings also at the end. On the other hand, the companies who ranked initial motivation as 3, increased it to 2 by the end (8 companies). Instructors in these companies state that they made significant efforts to raise the motivation of the whole group, stating also that they were most strongly motivated by the production process itself and the creativity which they could see in it (this applies to all three educational profiles).

Graph 18. Students' motivation for practical training



- *“During the preceding year the students were very motivated. They acquired all the necessary skills. After the practical training they were interested in doing the atest. This implies the whole process – theoretical knowledge, practical work, diploma, and the atest. It is now a ready beginner who is now beginning to further develop himself.”*

The exception to this are four students in “RB Kolubara”, who from the very beginning conducted their in-company training in RB Kolubara and whose motivation was assessed throughout the period with the rank 4.

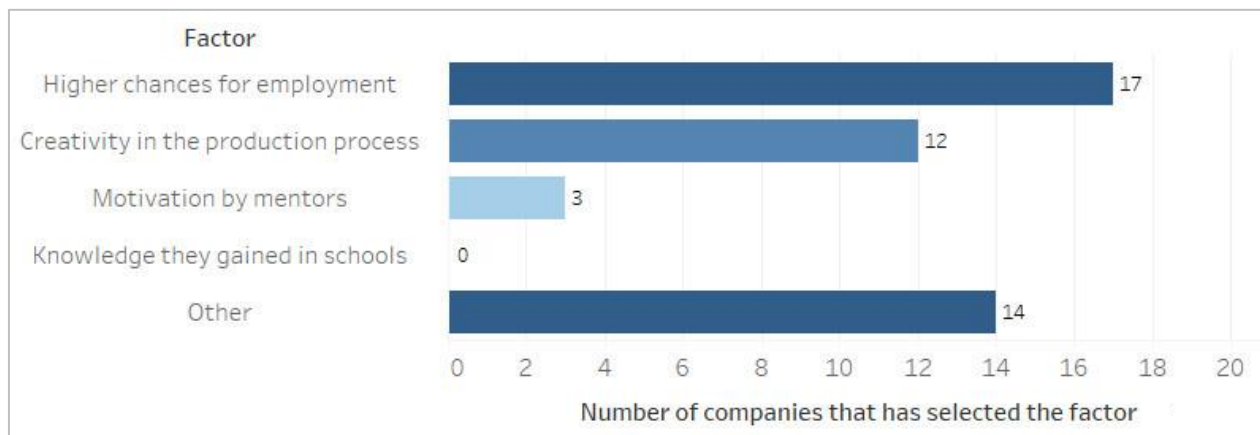
- *“The general impression is that students are not overly motivated. The assessed rank is 4. None of them is exhibiting an ambition to engage later in lie in the profession for which they are being*

educated. They say they enrolled in school for different reasons and they did not know where to enroll. They attend in-company training as a formality and part of their school programme.”

Higher likelihood of employment and creativity of the production process are stated as key factors influencing the motivation. As many as 43% of instructors state that students become more motivated when they understand the operations involved in production, and the increased motivation ensues for those who get involved (graph 19). The companies stated an additional factor: potentially higher earnings after employment in companies in Serbia, and especially abroad. The financial compensation that the students receive during the in-company training is also a motivation factor. Students from socially vulnerable regions see this as an opportunity to improve their social status.

- *“It all equally influences students’ motivation. There si need to work with young people, show commitment, approach them in a friendly way, and get closer to them through their work assignments.”*

Graph 19. Factors influencing students’ motivation*

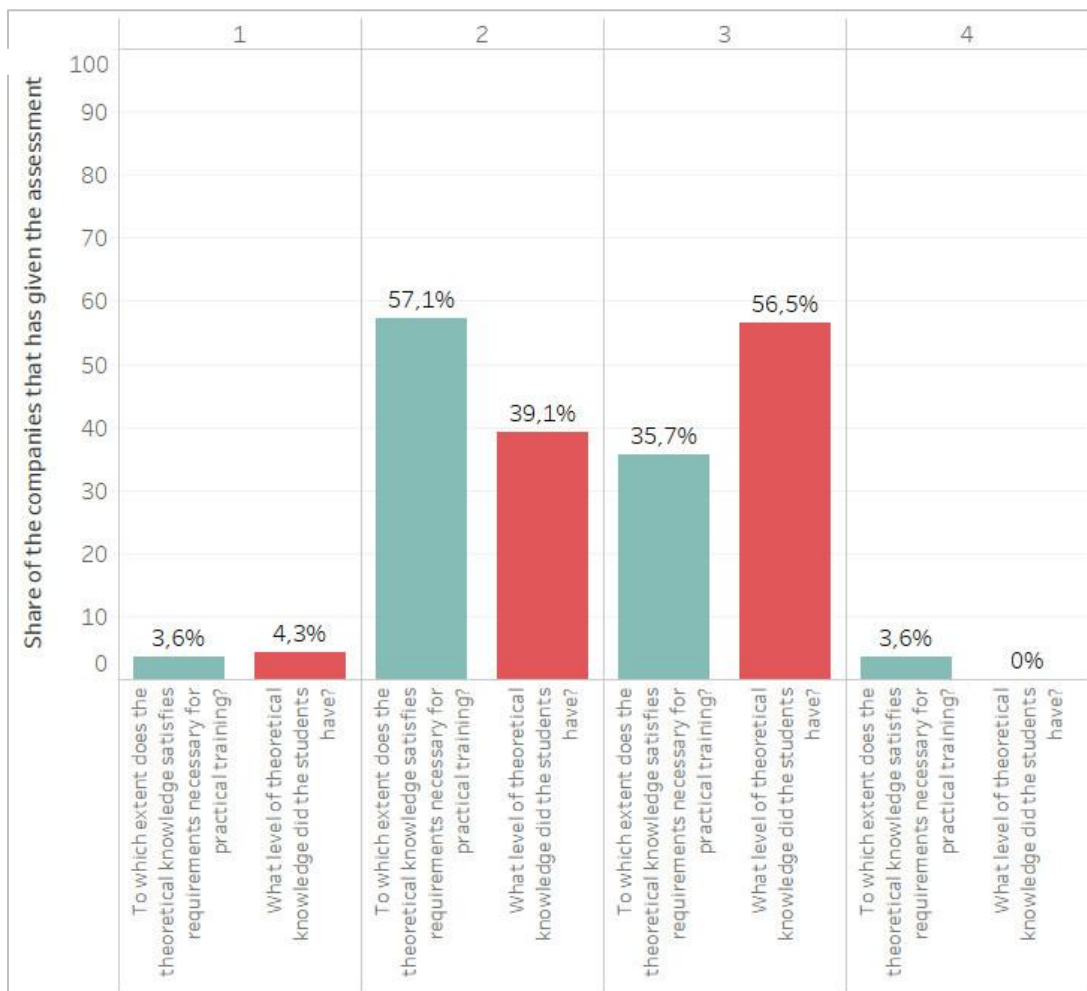


*Company could choose all the answers about itself

On the other hand, it should be noted that none of the company thinks that the knowledge acquired in schools has a positive impact on students’ motivation. This insight is an indication that the education system is not sufficiently successful in motivating students to work in production companies. Nevertheless, in order to understand the reasons for this position, additional research is needed. The questions are: (1) Is this the issue of the existing curricula? (2) Is the challenge related to insufficient motivation of teachers teaching theoretical part of education? (3) Is this challenge resulting from methods used and the need to make theory more tangible already in the classroom with practical examples? (*“Robert Bosch” stated item 3 as an important example of how theoretical teaching can be improved to suit the needs of the practical training: an example in physics – for each force which is being taught, there are possible practical examples that can be presented*).

Instructors assess the theoretical knowledge that the students possessed at the beginning as very low (graph 20). Instructors in as many as 57% of companies ranked with 3 the theoretical knowledge of students.

Graph 20. Assessment of theoretical knowledge of the students



Companies state that one of the key things for promotion of cooperative (and dual) model of education is by promoting and popularizing these educational profiles. “Politehnička škola” from Kragujevac is a good example of active promotion of educational profiles among the young people. During the two preceding years this school undertook an active campaign “Do you want to be part of the modernised educational profile locksmith-welder?”.

7. ROOM FOR IMPROVEMENTS

Companies are expressing greater satisfaction with the model of cooperative education, but also with its implementation. However, they think that further improvement is needed. This chapter presents segments of cooperative model of vocational education subject to potential improvements, seen from perspective of companies.

Legislative and institutional framework

The engagement of companies in conducting in-company practical training is regulated not only by laws in the field of education, but also by laws in the field of labour and occupational health and safety. A major challenge is the implementation of the Decree regulating dangerous work for children as of 1 January 2018.

Companies are pointing to the need to harmonise the relevant legal framework regulating obligations of all parties involved in this process – students, through contracts of students and/or their parents or guardians and the companies, as well as contract between the school and the company. They believe that the companies should receive additional support in implementing the existing legal framework.

Further development of the cooperative model is perceived by companies through establishment of an adequate institutional framework with clear responsibilities and competences for implementation and further development. Suggestions were made to intensify the engagement of the Serbian Chamber of Commerce and Industry, which is also recognised in the new Law on Dual Education.

Another measure of improvement which has been identified is reducing the administrative burden in concluding contracts with minors and payment for their financial compensations.

Instructors

Companies state the need to regulate the position of instructors within companies, improve the method of their selection, and enable training for a greater number of instructors in the companies. Companies need to have an employee engaged full time to instructor students and manage the overall process of in-company training.

Enrolment and selection of students

The problem of motivation of students enrolled in these educational profiles, in the opinion of the companies, is that enrolment in these profiles was not the students' first choice, rather they were allocated to these profiles based on computer distribution at the time of enrolment. They often state that teaching motivated students is much efficient.

Further improvements in this area would certainly imply adjusting the enrolment procedures after the models used in countries with dual education model.

With respect to selection of students enrolled in schools and their allocation to in-company training, after the first or second grade, the experience acquired so far should be analyzed to develop a mechanism to support schools and companies in this respect.

Cooperation with schools

Companies state that relevant procedures need to be established to ensure transparency of this cooperation and also raise the level of responsibility of both partners. Three working groups should be established as a form of exchange of experiences, strengthening cooperation between schools and partner companies, and also in order to support each other.

It is very important for teachers to regularly visit the students while doing in-company training and work closely with instructors. With respect to monitoring students – regular attendance, work discipline, motivation, and performance appraisal – it is necessary to establish standardized monitoring and appraisal systems. Performance appraisal for students must be a joint obligation of the teacher of practical education and the instructor and master in the company in charge of in-company learning.

With respect to planning there is need to introduce procedures of joint planning of practical teaching by the school and the company. These procedures should cover the methods of monitoring implementation and relevant records to be maintained.

Curriculum and final examination

The key statement by companies with respect to the curriculum for educational profiles locksmith-welder and industrial mechanic refers to the need to introduce contents relevant to modern technologies, harmonization of theoretical and practical teaching and enabling a part of the curriculum to be flexible to accommodate technologies used by the company where practical training is conducted. This is especially relevant to the educational profile industrial mechanic. Additionally, the curriculum for locksmith-welder should be optimized to better prepare students in the field of technical drawing (drawing and reading of drawings), materials, and different welding technologies.

With respect to the educational profile electrician, all companies implementing this in-company training have stated that this curriculum should be redefined as it includes three very diverse profiles making it complicated/impossible to implement.

In case when companies cannot conduct a part of the technical training, and when a part of the curriculum is conducted in school workshops, companies state that there is need to achieve an understanding between the school and the company to avoid these two parts being completely separate, but such as to achieve correlation between the two. This means that practical training should be planned at school (class) level and all companies where the students have practical training in order to ensure that they all acquire the prescribed skills and achieve the learning outcomes, irrespective of whether they attend practical training in the company (or in which company) or in the school workshop. Joint planning of practical training is an important segment of cooperative education and that is why the companies are suggesting that it should be further developed in the coming period.

An analysis should be conducted of the final examination for all three qualifications based on the report on examination results and a round table should be organised with the companies to hear their suggestions. Based on such an analysis, if necessary, work tasks for examinations should be reviewed, to make them more relevant to acquiring the qualification. Companies had a number of suggestions in this respect: for introduction certification tests within the final examination, through introducing more demanding theoretical questions, and harmonising testing among companies.

Financial subsidies for companies

Some companies suggested introducing financial support in equipping job positions for students and subsidies for their job positions. Improving conditions in school workshops – through their better equipment with materials for work, tools and equipment, in order to enable pupils to be better prepared for the in-company training whereby the effects of the overall education would be enhanced. This would require additional funding to be ensured.

As a form of support for students of the educational profile locksmith-welder companies are suggesting financial support for them to take the certification tests in the final year of learning.

Companies located within industrial zones outside of the public transport zones, are suggesting, as a form of financial support for students, a solution to be found for transport for students to companies.

Students' motivation

Special effort should be invested in motivation and pedagogical approach to the young people, who are not only adolescents, but can also exhibit some forms of problematic behavior.

Active promotion of educational profiles

Educational profiles should be actively promoted for young people to be motivated to work in production companies within these profiles.

ANNEX 1. Roles and duties of all actors involved in cooperative model of vocational education

The key actors involved in the cooperative model are: employers, schools and local governments.

The employer is a legal entity or a person whose activity enables application of the 3-year vocational education curriculum. The curriculum offers the students an opportunity to achieve the expected learning output in line with skills' standards and the curriculum. The learning is performed in part through practical education in employer's work environment, where the students perform real work. Each curriculum defines the conditions (material-technical and human resources) in which it can be applied. Relations between the school and the employer are defined in a contract on realization of practical education, drawn separately for each curriculum.

The employer is expected to:

- plan realization of the practical education in cooperation with a mid-level vocational education school;
- realize the practical education in his/her work environment, based on the skills' standards, the curriculum, and the plan for practical classes;
- provide a required number of trained instructors and thus enable application of the curriculum and the practical classes
- provide the space, equipment, and means needed for work and learning, in line with the law and related regulations;
- provide the safety conditions for work and also safety gear for the students at work;
- bear the cost of students' additional insurance related to the nature of work performed;
- respect the students' persons and protect their privacy
- keep record of the students' attendance at the practical education classes;
- cooperate with the teachers of practical education in order to enhance the students' learning output;
- take part in realization of the final exam;
- organize supervision and evaluation of the achieved learning output, in cooperation with the school

Within the cooperative model, the employer **may** provide several types of support for the students, the teachers, and the school during the learning period, such as:

- financial remuneration to students for their work;
- compensation for the costs of food and transport
- professional training for the teachers in mid-level schools for vocational training
- entering into a public-private partnership with schools and local governments, in order to provide school workshops with adequate equipment and materials needed for the realization of vocational education during the first year.

Mid-level school for vocational training applies the curriculum in line with standardized procedures and pursuant to the law.

The school is in particular expected to:

- promote the concept of cooperative education among the parents, students, potential students, and the employers;
- make an admission plan for the students based on the cooperative model and the needs of local economy, and enter cooperation with appropriate employers in the near environment;
- conclude separately contracts with one or more employers on the implementation of each curriculum;
- plan realization of the practical classes, in cooperation with all the employers (instructors) who concluded the contract on realization of the practical education;
- prepare the students for practical education at the employer's premises
- ensure that safety measures are applied fully and advanced to protect the students while performing practical classes at the employer's premises;
- monitor and evaluate the students' achievements, in cooperation with the instructors;
- provide a flexible organization of classes, in line with the plan for realization of the practical classes at the employer's premises;
- ensure that the teachers of practical education evaluate and assess the students' achievements at the employer's premises, in cooperation with the instructor;
- cooperate with the instructors and parents in order to advance the students' learning;
- organize professional training for the teachers in the field of production technology, in cooperation with the employer

Local government is in charge of financing the school's material costs, and mid-level schools are obliged to coordinate their admission plans with the local government.

Local governments can provide in different ways support for the students/schools in applying the cooperative education model:

- by providing the means for students' regular insurance;
- by providing the means for students' additional insurance;
- by providing stipends/scholarships for the students trained in jobs in short supply;
- by financing the students' commute;
- by providing students' accommodation during the school year;
- by financing procurement of text books and relevant literature for the school's students and teachers;
- by entering public-private partnerships with the school and the employer in order to procure adequate equipment and material for the school workshops.

ANNEX 2. The questionnaire used for face-to-face interviews

I. GENERAL INFO ABOUT COMPANY

1. Company ID
2. Name of the company
3. Registered economic activity of the company
4. Place of registration of the company
5. Number of employees (total number + number of employees in production)
6. High school the company cooperate with

II. PRACTICAL TRAINING IN YOUR COMPANY

7. When did you start practical training by the new program?
_____ (year)
8. Did you have practical training before this new program has been established?
[1] Yes [2] No
9. How often and for how long did the practical training last?
_____ (provide details)
10. When did you started with direct cooperation with school?
_____ (year)
11. Can explain in detail what did the program of practical training include?
_____ (provide details)
12. How did you obtain operative plan of practical training?
[1] Obtained pre-defined plan directly by the school;
[2] You were able to affect operative plan after the joint work with the school
_____ (provide details)
13. How were the students included in the production process? *(Optionally: What percentage of time student worked directly on machines?)*
[1] They were directly engaged in working with machines
[2] They were just observing
_____ (provide details)
14. If the answer for the previous question was [1], what is the difference between the type of machine used in your company from those in schools? Are they different from those they already have in school?
[1] Yes [2] No
_____ (provide details)
15. To which extent tasks provided by school reflect real working task in your company? Did the students have the chance to learn and work on the tasks that would have been a “real” task if they had worked for the company?
_____ (provide details)
16. How did you evaluate progress and overall performance of students? Do you have standardized evaluation process?

- [1] We have a standardized method for evaluation process
- [2] Depends from student to student
- [3] We do not evaluate them. Evaluation is done by the school
- _____ (provide details)

17. Alternation of theory and praxis
 _____ (provide details)

III. SATISFACTION WITH PRACTICAL TRAINING

Questions for COMPANY OWNERS/MANAGEMENT

18. How many students was on the practical training in your company?
 _____ (number of mentees)
19. How many instructors is engaged on the practical training in your company?
 _____ (number of instructors)
20. How would you describe practical training in your company?
- a. What works well?
 - b. What aspects of the practical training were particularly satisfying?
 - c. What are obstacles?
 - d. What aspects could be improved?
- _____ (provide details for all question)

Cost and benefits of practical training for the company

21. What was the motivation for your company to take part in practical training in cooperation with schools?
- [1] We want to attract young/new employees
 - [2] We want to influence how potential employees are trained during their high school
 - [3] We see ourselves as a socially responsible company
 - [4] Other
- (Check all that apply)
 _____ (provide details)
22. What are the costs and what are the benefits of providing practical training for your company?
- Costs _____ (provide details)
 (Provide examples: time employees have to invest and spend with students; risk that students will spoil something/machines; risk that students will get hurt)
- Benefits _____ (provide details)
23. Do the benefits exceed the costs of providing practical training?
- [1] Yes [2] No
- _____ (provide details)
24. How much did the practical training in your company improve employability of the students?

Interval: 1 - 2 - 3 - 4

25. In which aspects?

_____ (provide details)

26. How many of students were employed after the practical training? What were the reasons for not employing them/some of them?

_____ (provide details)

Cooperation with schools

27. How satisfying was the communication and cooperation with school?

Interval: 1 - 2 - 3 - 4

_____ (provide details)

28. On which issues have you communicated with the school?

_____ (provide details)

29. Does the curriculum reflect the company's requirements and modern working conditions?

[1] Yes [2] No

_____ (provide details)

30. Does your company have opportunity to communicate your experience in practical training with school -- and eventually is there a room for curriculum adjustments based on the needs of companies?

[1] Yes [2] No

_____ (provide details)

31. Have you noticed that something important is missing in the curriculum so far?

_____ (provide details)

32. If you have, did you inform the school on that?

_____ (provide details)

33. Did school do something?

_____ (provide details)

Other

34. How did you make selection process for instructors in your company?

[1]

[2]

[3]

35. Do you exchange experience with other companies on students' practical training?

[1] Yes [2] No

_____ (provide details)

36. Where do you see your contribution in improving the TVET system? (So far and in the future)

- a. Coordination between practical and theoretical learning processes
- b. Involvement in curricula development
- c. Involvement in the final exam

_____ (provide details for all question)

Questions for INSTRUCTORS

37. How would you describe practical training in your company?
- What works well?
 - What aspects of the practical training were particularly satisfying?
 - What are obstacles?
 - What aspects could be improved?

_____ (provide details for all question)

Students related questions

38. How many students were your mentees in the last year?
_____ (Number of mentees)
39. How many hours does it last?
_____ (Number of days in a week x number of hours a day)
40. Are they fully involved in practical training all that time?
[1] Yes, all six hours [2] Partly, several hours [3] Less than half of the time [4] They don't work at all
_____ (provide details)
41. What level of theoretical knowledge did the students have?
Interval: 1 - 2 - 3 - 4
42. To which extent does the theoretical knowledge satisfy requirements necessary for practical training?
Interval: 1 - 2 - 3 - 4
_____ (provide details)
43. Did you have the opportunity to see how does the curriculum look like?
[1] Yes [2] No
Who did inform you on the curriculum?
[1] Students
[2] Teachers
[3] Other
44. Were you satisfied with students' overall performance by the end of their practical training?
[1] Yes [2] No
_____ (provide details)
45. How much practical training contributed to students' overall performance?
Interval: 1 - 2 - 3 - 4
In which aspects?
_____ (Name and explain the aspects)
46. How would you rate the following performance? (1 - 4)

| Category | Student rate | |
|--|--------------|--|
| Respecting work discipline | | |
| Tidiness of the workplace | | |
| Safety at work | | |
| Regular attendance | | |
| Interest in work | | |
| Mastering the prescribed competencies | | |
| Compliance with procedures / hierarchies | | |

47. Were the students interested and dedicated to practical training?

[1] Yes [2] No

How would you rate their interest before they started the program of practical training?

Interval: 1 - 2 - 3 - 4

How would you rate their interest after they finished the program of practical training? (*Did something change?*)

Interval: 1 - 2 - 3 - 4

_____ (*provide details*)

48. What are the reasons behind the students' interest?

[1] Creativity in the production process

[2] Knowledge they gained in schools

[3] Motivation by instructors

[4] Higher chances for employment

[5] Other _____

(*Check everything that apply*)

_____ (*provide details*)

49. What was the reason for applying for this profile (electrician, locksmith-welder, industrial Mechanic)?

[1] Somebody told them to do so (parents)

[2] They were initially interested to do so

[3] They want to work in a company after the high school

[4] Because entire family is in the same profile

[5] Other _____

(*Check everything that apply*)

_____ (*provide details*)

50. How many years is needed (in general for any individual at the beginning) for students to learn necessary skills for independent work with basic requirements?

_____ (*number of years + provide details*)

51. If you have female students in your company for training, how would you describe their practical skills, theoretical skills and social competences in comparison to male student?

_____ (*provide details*)

52. If you have socially vulnerable students in your company for training, how would you describe their practical skills, theoretical skills and social competences in comparison to male student?

_____ (provide details)

Cooperation with schools

53. How satisfying was the communication and cooperation with school?

Interval: 1 - 2 - 3 - 4

54. How would you describe communication and cooperation with school?

_____ (provide details)

55. In which way were they included in the process of practical training?

_____ (provide details)

56. Did you have the opportunity to summarize experience together with the school by the end of the year?

[1] Yes [2] No

Cost and benefits of practical training for the company

57. How program of practical training influenced regular daily production process in your company?

[1] Production process continued without disruption

[2] Part of the production processes had to be on hold

[3] Other

58. What are the benefits of providing practical training for your company?

_____ (provide details)

59. How much of your/machine time do you have to invest per student?

_____ (provide details)

Training for instructors

60. Did you have formal training dedicated to giving practical training to the students? (Optionally:

What was the thing that impressed you most on the training?)

[1] Yes [2] No

61. How long did it last?

_____ (Number of days)

62. What aspects of training did it include?

_____ (provide details)

63. Who did conduct the training?

[1] German speaking instructor

[2] Serbian speaking instructor

64. What was the satisfaction with training for instructors provided by GIZ?

Interval: 1 - 2 - 3 - 4

65. Did you consider yourself ready to work with students?

[1] Yes [2] No

66. What aspects can be improved?

_____ (provide details)

67. How many instructors from your company did have the formal training?
 _____ (Number of instructor)
68. Who did have formal training in your company?
 [1] Instructors only (the ones who work directly with students)
 [2] Management only
 [3] Both instructors and management
69. Would you consider useful if there was a written handbook for working with student?
 [1] Yes [2] No

Questions for EMPLOYED STUDENTS

70. Were you satisfied with your education in the modernized profiles?
 71. Were you satisfied with your work and working conditions?
 72. How would you describe curriculum and did they contributed to your working process?
 73. Did the practical training improve employability?

IV. SATISFACTION WITH THE SUPPORT PROVIDED BY GIZ

74. Regarding the participation in the Project -- were the expectations met?
 [1] Yes [2] No
 _____ (provide details)
75. How satisfied were you with the support provided by GIZ?
 Interval: 1 - 2 - 3 - 4
76. What aspects of the support were particularly useful/satisfying?
 77. What could be improved?

V. ROOM FOR IMPROVEMENT

78. What aspects of practical training you think should be improved, and in which way?
 [1] Curriculum
 [2] Cooperation with the school
 [3] Training for instructors
 [4] Student behavior
 [5] Methods of assessment of students
 [6] Other _____
79. What the Government should do in order to improve practical training?