

## Collection and analysis of data on High Technical Schools

According to project activities in CREDO II, activity 2.1.1.2 *Improving the cooperation between: companies in metal-processing sector, Faculties of Technical Science, Secondary Technical Schools, Unemployment Offices, Government, etc.*, sub activity *Collection and analysis of data on High Technical Schools* has made the collection of relevant data (Figure 1) about educational institutions that educate the workforce in the field of professional occupations and technicians for the metal processing industry. Created and presented questionnaires included questions related to specified basic information on institutions, the number of employees, educational profiles, the number of pupils enrolled/matriculated for period 2003÷2008, the number of pupils enrolled/sections for period 2003÷2008, laboratories and cabinets for practice lectures and possibilities for organisation and delivering of specific education programs (appendix).

Figure 1 Appearance of the questionnaire survey (given in the attachment)

The above questionnaire is aimed to carry out primary analysis about providing of specific services in accordance with the legislation for secondary technical schools (long life learning, education, retraining) as well as for roughly establishment of specific trends that will serve to companies to synchronize their development plans with the available workforce at the market and its specific knowledge, as well as to faculties for planning of enrolment policy. Criteria for selecting of technical schools that are sent survey questionnaires was primarily location, i.e. belonging to the economic region of north-eastern Bosnia and Herzegovina, Figure 2.

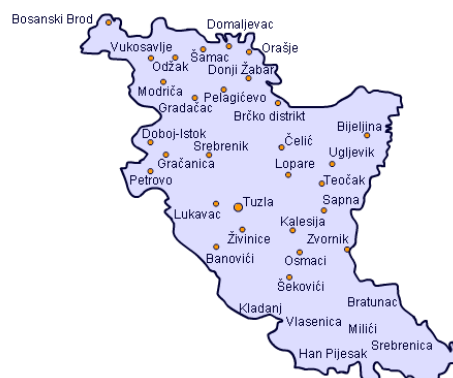


Figure 2 Economic region of north-eastern Bosnia and Herzegovina

According to above mentioned criterion questionnaires were sent to all secondary technical schools in economic region of north-eastern Bosnia and Herzegovina, which in its educational program includes occupations related to metal processing sector. The list of secondary technical schools is given in Appendix 2. Unfortunately only a small number of secondary technical schools submitted its questionnaires. However, by additional engagement of local consultants and NERDA staff sufficient data was collected which are used for proper analysis of the situation in secondary technical schools of economic north-eastern region of Bosnia and Herzegovina. Data were collected from all secondary technical schools in Tuzla Canton (data taken from the Educational Pedagogical Institute Tuzla Canton), secondary technical schools in Bijeljina and Bratunac form Republic of Srpska and secondary technical schools from Brčko District. Before presenting of obtained results, it is important to emphasize notorious trend of reducing of pupil's number who enrolled each year in the education system throughout Bosnia and Herzegovina. As an example, the above trend can be viewed through number of enrolled pupils in primary and secondary schools in Tuzla Canton (due to data availability) period 2000÷2008, Figure 3.

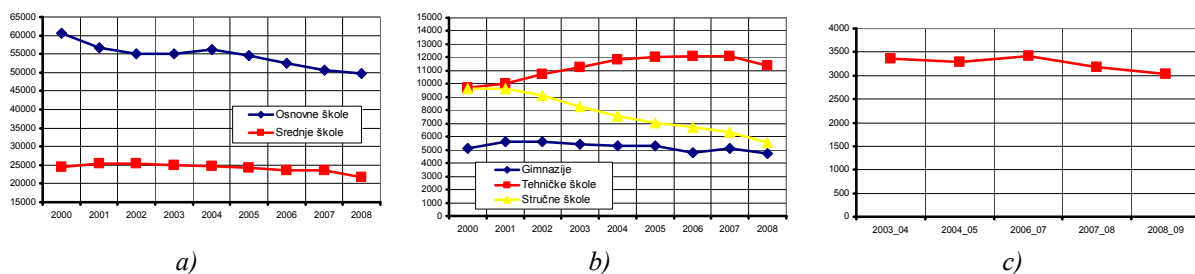


Figure 3 a) Review the number of enrolled pupils in primary and secondary schools in Tuzla canton, b) overview of the number of enrolled pupils in high schools, secondary technical and professional schools in Tuzla Canton, c) the total number of pupils in secondary schools with mechanical background in Tuzla canton

Although by the figure 3 are presented the state only in Tuzla Canton, it should be aware of the fact that more or less similar situation is in all parts of economic region of north-eastern Bosnia and Herzegovina. So, from this figures it can be clearly seen the trend of reducing the number of pupils in primary and secondary education level. Also, the trend of approximately constant number of pupils in high schools, the trend of reducing the number of pupils in professional schools can be noticed, while the number of pupils in secondary technical schools is growing continuously in the period 2000 ÷ 2008th. For the secondary technical school with mechanical background from diagrams presented at Figure 3 it can be noticed trend of reducing the number of pupils in secondary technical schools with mechanical background in Tuzla Canton, however, the given trend is not as evident as in other professions. On this basis, it might be conclude that there is continual interest of students for education in mechanical occupations. The above trend is largely caused by the proactive policy of secondary technical school with mechanical background in relation to scouting and registration of new pupils and opening of new attractive sections.

Number variation of matriculated pupils in the considered period in professional and technical secondary schools with mechanical background is presented by Figure 4. Comparing the figures 4a and 4b it is possible to notice a trend of gradual increasing in the number of pupils who matriculate in technical professions, while the number of pupils in professional positions is decreasing proportionally. This trend is particularly evident in the area of Tuzla Canton, while in the economic region of north-eastern Bosnia and Herzegovina which is in the Republic of Srpska including the of Brčko district status is approximately constant. Because of profile of collected data a total state in relations between number of matriculated pupils in secondary technical schools and professional schools with mechanical background in the region of north-eastern Bosnia and Herzegovina was presented in relative

amounts or percentages, figure 4c. By analysis of relations between number of matriculated pupils in secondary technical schools and professional schools with mechanical background in economic region as a whole, the increasing trend of number of pupils who matriculated in technical professions was observed, while the number of pupils who finished secondary schools in professional positions gradually decrease. The above trend indicates the growing interest of pupils for the continuation of education at faculties or interest acquisition of higher quantum of knowledge, etc. This situation can be treated as a consequence of the gradual improvement of the technological level of metal processing companies in economic region, which requires wider knowledge from all employees at the same time.

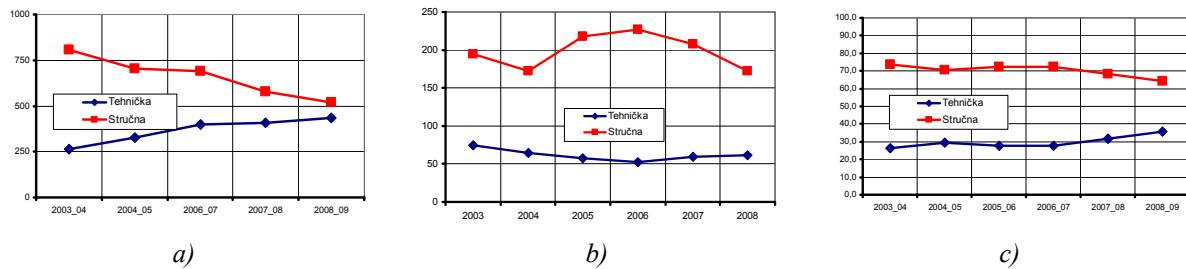


Figure 4 Overview of the number of pupils matriculated in secondary technical and professional schools in: a) part of Republic of Srpska in economic region covered north-eastern Bosnia and Herzegovina + Brčko district, b) Tuzla Canton, c) the total relative share for economic region of north-eastern Bosnia and Herzegovina

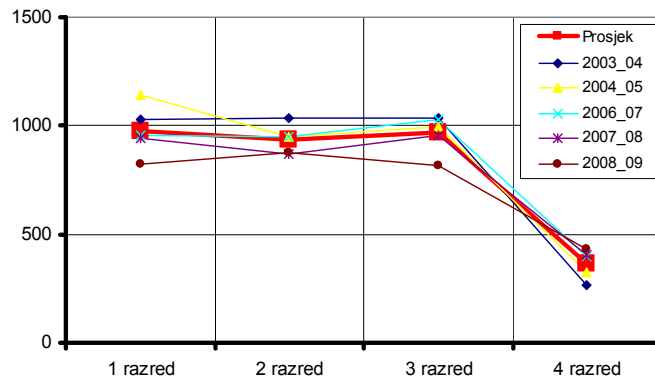
Pupils of technical secondary school with mechanical background have available a range of orientations that are presented by Table 1.

Table 1 Overview of orientation in secondary technical schools with mechanical background in the economic region of northeast Bosnia and Herzegovina

SECTION	Technicians	Professional occupations
	Mechanical technician	Auto mechanic
Mechanical technician operator for CNC machines	Auto tinsmith	
Mechanical technician for computer design	Locksmith - Gas installer and plumber	
Mechanical technician for aviation	Locksmith - Central heating installers	
Mechanical technician for energetic	Central heating installers	
Technician for mechatronic	Gas installer and plumber	
Technician for motor vehicles	Welder	
-	Auto tinsmith - locksmith	
-	Locksmith - welder	
-	Tinsmith-locksmith-welder	
-	Locksmith	
-	Metal scraper	
-	Metal scraper - locksmith – metal milling	
-	Locksmith - metal scraper	
-	Metal scraper – metal cutter	
-	Metal cutting	

Although there are many sections that pupils of secondary technical schools with mechanical background can choose it is important to note that many of them are results of tradition rather than actual labour market needs and, as such, provide plenty space for introduction of new sections in which train pupils will educate for work in specific areas which requires metal processing sector of economic region NE B&H. Wide range of educational fields and sections also provides significant potential for further training and retraining of currently unemployed workers at Employment Services.

Unlike to a higher education institutions who educate workforce for metal processing sector, where is possible to notice a significant outflow of students through the process of study - especially significant in the “preparation” phase of the study (1 and 2 years of study), secondary technical schools with mechanical background as well as all other secondary and primary schools have large percentage of “mobility” between classes through education process. Review of pupils “mobility” between classes in secondary technical schools with mechanical background in Tuzla Canton (available data) is presented by Figure 5.



*Figure 5 “Mobility” of pupils between classes in secondary technical schools with mechanical background in Tuzla Canton*

Based on all collected (available) data and the previous diagram can be concluded that in the coming period will continue the trend of slight decline (demographic reasons) of number of pupils who enter secondary technical school with mechanical background. Also, according to observed trends it can be expect to a growing number of pupils who will enter into technical sections of secondary technical schools, while the number of pupils interested in professional sections will gradually decline. It is expecting that this trend will not accelerate in the further, and in the near future relationship between numbers of pupils who entered in technical/professional sections in secondary technical schools with mechanical background will stabilize at 50/50 percent. Of course this trend from secondary technical schools require adjustment of curricula and close coordination with the metal-processing industry, higher education institutions, governmental and non-governmental sector with the aim to maximally utilise of expected developments for the benefit of entire community. It is important to note that strong step forwards made by metal processing sector of north-eastern region of Bosnia and Herzegovina, and better and better working conditions in the sector additionally favour to mentioned development of situation and it is expected to stimulate additional number of pupils to decide for education in secondary technical schools with mechanical background.

Questionnaire submitted to secondary technical schools with mechanical background contained questions related to the laboratory potentials, equipment in cabinet for practical training, qualifications of employees, and the ability to provide additional training/retraining services to interested parties. Generally speaking, all the secondary technical schools with mechanical background have available and appropriate professional teaching staff who through continuous educational process and specialisations improves their knowledge. By this way is enabling continuous tracking of contemporary professional trends in the approach to teaching and in transferring of new knowledge to pupils. Of course in this field, there are possibilities of additional engagement primarily through cooperation with institutes, higher education institutions, especially with metal processing companies that have an interest to employ a workforce with satisfactory skills and knowledge. On the other hand equipment of laboratory complexes and the cabinet for the practical teaching is unsatisfactory. In fact, in

most cases laboratory equipment is out of date or equipment-resources do not exist at all. Of course here are some exceptions which essentially confirm the above rule. In order to raise the quality of education on secondary level it is necessary to make significant efforts exactly in this segment of secondary education. For this step, there are various possibilities, such as, co-financing in equipping of laboratories and cabinets for practical work, opening of manufacturing plants, laboratories in metal processing companies, institutes, and higher education institutions to secondary school pupils, joint applications for domestic and international projects, etc. It is worth emphasize that all the surveyed schools are ready to put all their available resources for additional training and retraining at the disposal to metal processing companies in the economic region of north-eastern Bosnia and Herzegovina on certain economic principles. In this aim, for instance, can be used resources provided by CREDO project and other projects financed by governmental and non-governmental sector. Overview of potential areas for additional training /retraining of secondary technical schools with mechanical background in economic regions north-eastern Bosnia and Herzegovina is presented by Table 2.

*Table 2 Overview of potential areas for additional training / retraining at secondary technical schools with mechanical background in the economic region of northeast Bosnia and Herzegovina*

<b>Laboratories, cabinets for practice work</b>	<b>Areas for additional training/retraining</b>
Laboratory for CNC	NC/CNC operators
Laboratory for hydraulic and pneumatic	CAD/CAM software
Laboratory for CAD	Locksmith
Laboratory for motors and motor vehicles	Welding
Laboratory for electric measurements	Foreign language
Car workshop	MS Office
Locksmith workshop	-

In order to achieve optimal utilization of resources for additional training / retraining, it is important to note that it is necessary to include in eventual projects all interested parties (metal-processing companies, technical secondary schools, institutes, higher education institutions, government and NGOs) to ensure synergic co-ordination and achievement of maximum impact of indicated process.

## **Appendix 1 (Survey questionnaire)**

**Appendix 2 (list of secondary technical schools with mechanical background in economic regions of north-eastern Bosnia and Herzegovina)**

- Brčko, JU Tehnička škola Brčko
- Bosanski Brod, Srednja škola "Nikola Tesla"
- Bratunac, Srednjoškolski centar "Bratunac"
- Banovići, JU Mješovita srednja škola Banovići
- Bijeljina, Tehnička škola "Mihajlo Pupin"
- Bijeljina, Srednja stručna škola Bijeljina
- Čelić, JU Mješovita srednja škola "Abdulah Kovačević"
- Doboj Istok, JU Mješovita srednja škola Doboj Istok
- Gračanica, JU Mješovita srednja škola Gračanica
- Gradačac, JU MSŠ Hasan Kikić
- Kalesija, JU Mješovita srednja škola Kalesija
- Kladanj, JU MSŠ "Musa Ćazim Ćatić"
- Lukavac, JU Mješovita srednja elektro-mašinska škola Lukavac
- Lopare, Srednjoškolski centar "Vuk Karadžić"
- Milići, Srednjoškolski centar "Milići"
- Modriča, Srednjoškolski centar "Jovan Cvijić"
- Petrovo, Srednjoškolski centar "Petrovo"
- Sapna, MSŠ Sapna
- Srebrenik, JU Mješovita srednja škola Srebrenik
- Šamac, Srednja škola "Nikola Tesla"
- Teočak, JU Mješovita srednja škola Teočak
- Tuzla, JU Mješovita srednja mašinska škola Tuzla
- Ugljevik, Srednja škola "Mihajlo Petrović Alas"
- Vlasenica, Srednjoškolski centar "Milorad Vlačić"
- Vukoslavlje, Srednjoškolski centar "Nikola Tesla"
- Zvornik, Gimnazija i srednja stručna škola "Petar Kočić"
- Zvornik, Tehnički školski centar Zvornik
- Živinice, JU MSŠ Živinice