

# Dual Education and Occupational Safety Training

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## Abstract

Recently, the dual education system in the Slovak Republic has proved to be an exceptional model for preparing pupils for future professions. It means a partnership between pupils, schools, and companies. Each training needs to be adjusted to the age, pupils, and their mental abilities. Introductory training in occupational safety in dual education is entirely in the competence of the employer. We verified the knowledge obtained during the training by an attitude questionnaire, in which participated 90 respondents prepared for professions in the automotive industry. The questionnaire analysis revealed that pupils consider the level of training in occupational safety and health to be sufficient, and they are satisfied with the level of acquired knowledge. However, paradoxically, we found out that they fail to answer questions about the danger and risks at the workplace to which they will be exposed in their current and future work. This OSH education is the main topic of the whole training process regarding early risk identification and appropriate prevention. A fundamental recommendation measure is the quality inclusion of these OSH topics into training using activating methods in the process. They should also be part of methodological and professional training. Employer lecturers should support and implement new methods and forms of training for pupils' safe behaviour.

## Keywords:

Vocational education and training (VAT)  
Dual system  
Risk at work  
Pupils  
Employer lectures

## 1 Introduction

The dual vocational education and training (VET) system is a specific and internationally accepted form of preparing the young generation for their professions. In their essential aspects, dual VET systems abroad are almost the same; they have their standard features, but, of course, we can find differences there as well (Remington, 2017). These differences are mainly in various types of vocational education in particular countries (Hrmo & Podařil, 2013). They are primarily influenced by the educational systems, specific labour market requirements, legislation, finance forms, etc. European countries have used educational systems for the vocational preparation of young people before they enter the labour market already for many years. Austria, Germany Liechtenstein and Switzerland belong to the most successful countries in this area (DC dVET, 2021). Thanks to their dual educational systems and intensive apprenticeship programmes, these countries have created a very close connection between their educational systems and industry (Simonics, 2020).

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In Slovakia, the unemployment rate of persons aged 15–24 years was 26.5% in 2015 as opposed to 20.4% for the EU average (Hanushek, 2012). So, the VET started to be implemented since adopting the Law about VET in 2015 due to the changing labour market requirements (<http://dualnysystem.sk/>). Law no.61/2015 (Journal of Law) introduced a comprehensive legal regulation in VET, aiming to improve the school system flexibility concerning the labour market requirements (Act no. 61/2015 Coll.). Simultaneously, this regulation enables employers to participate actively in pupils` preparation following their needs (Határ & Rosinský, 2019). This law motivates employers to enter the dual education system, and in this way, they can participate in preparing the contents for education to meet the labour market requirements. Figure 1 depicts the difference between the school vocational education system and the dual education system in the Slovak Republic.

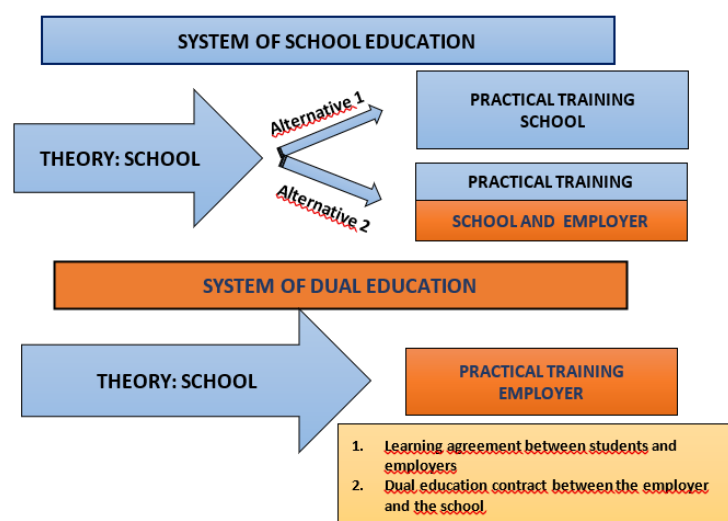


Fig. 1. Systems of vocational in the Slovak Republic (<http://dualnysystem.sk>, 2019)

The exceptional character of dual education lies in the legally accepted partnership between the employer and the pupil, defined as a learning contract. This contract regulates the rights and duties of Contracting Parties concerning practical education. On the other side, there is contractually bound cooperation between the employer and the school with the so-called Contract about the dual education, which defines the contents, conditions and organisation of dual education for students having a learning contract. According to the law about vocational education (act no. 61/2015), the employer is responsible for the whole practical education (Petríková et al, 2015; Hricová et al, 2018). A further benefit is that the employer can set the students` vocational preparation according to his requirements and needs, but at the same time, the employer bears all costs related to its realisation (Barnová et al, <http://dualnysystem.sk/>, 2019).

Dual education is also attractive to young people because it offers them a wide choice and many possibilities. The apprentice preparation provides all relevant skills and competences, which are necessary for performing specific professions. Besides, it provides pupils also with general, transferable competences beyond the scope of the company. Subsequently, pupils can apply these acquired competences not only in the given company, but in the whole industry sector and, generally, in the labour market as well (Rauner, 2007).

In this way, the dual VET covers an extensive range of various assumptions. From young people`s perspective, a very significant feature of its attractiveness is primarily „learning at the workplace“. Other important attractive aspects are stable perspectives of having a profession and being employed, good chances in the labour market, regulated work conditions and ways of further education, and possibilities of income improvement. Compared to exclusively school systems, a very relevant benefit of dual education for pupils is the possibility of entering into an employment relationship immediately after finishing their education. Young people see another positive aspect of earning their own money already during their studies (Temiaková, 2018; Gómez et al. 2021). In the dual VET, practical lessons take place at the employer`s workplace for practical education. This workplace is defined as an organisational unit or place, which belongs to the employer. The employer has the ownership or user rights to it, and he has a certificate of competency issued to provide practical lessons in the dual education system. In addition to VET, another significant part of pupils` preparation for specific professions is the education in Occupational Safety and Health (OSH). Employers provide this Occupational Safety and Health education for pupils who become their employees, and they prepare for their professions there. For this reason, practical

education at vocational schools is subject to Legislation and Regulations in the OSH area (Kordošová & Urdzíkóvá, 2017).

At all school system levels, including dual education, the contents and forms of education in the OSH area should be adjusted to pupils' age. For this reason, it is necessary so that the introductory OSH lessons and practical preparation for machine operations have a different form and contents from the OSH courses for adult employees. This OSH preparation must be adapted to the age group of pupils who participate in it (Forster & Bol, 2018; Gadušová et al., 2019).

The questionnaire survey was used to determine the qualitative level of introductory training and acquaintance of students before starting a practice, which was also the goal of the paper. The basic part of every job is not only knowledge of legal requirements, but also knowledge of hazards - "risk of work", the results of which will accompany them in the future safe profession.

## 2 Methodology

The research part aimed to determine the quality of introductory OSH training for pupils in the dual education system. It focused on pupils' knowledge about the OSH regulations and all possible risks at work they do for the employer.

We chose a secondary vocational traffic school for our questionnaire survey, which participates in the dual education system. The school provides excellent conditions, and it has good relationships with partner employers. They all try to meet the labour market expectations. On one side, the school provides pupils with preparation for specific professions according to the state educational system. On the other side, the school adjusts its education to the character of professions and vocational activities within the preparation for the given professions following the valid legislation.

Pupils prepare for occupational performance in several study fields. They finish them with a final school-leaving exam, and they also obtain a vocational certificate (four-year study fields):

- autotronic,
- commercial worker in traffic,
- plant operator of traffic management and economics, traffic management and economics.

Another possibility is a three-year study for the profession of an automotive technician finishing with a vocational certificate in these fields:

- automotive technician – mechanic,
- automotive technician – electrician,
- automotive technician - coachbuilder,
- automotive technician – car painter,
- ship technician.

The school also provides a possibility of further education in the form of a two-year post-secondary education in the following study fields:

- engineering,
- traffic operation,
- sale and service.

Most pupils choose the profession of an autotronic. Graduates of this study field can be successful as automotive engineers, automotive technicians, but they can also work in vehicles diagnostics, including hybrid vehicles. They can also apply their qualifications as plant, service or receiving technicians, car dealers, leading workers in car service stations or workers in technical or emission control stations.

We used dialogues with pupils, teachers and observations at workplaces. Using the questionnaire survey, we obtained information from pupils about the quality of their introductory training.

We administered 100 questionnaires to pupils, and out of them, we evaluated 90 filled questionnaires. Pupils answered the questions during our meeting with respondents and teachers' assistance. We explained the research objectives and principles to pupils before they answered the questionnaire items.

With this questionnaire, we observed whether methods and forms of OSH education are at an adequate level from the pupils' perspective. We also wanted to find out how pupils can apply their theoretical knowledge in practice. The questionnaire consisted of 17 closed questions. Respondents answered according to their agreement or disagreement with the given items on a 5-point Likert scale, starting from „1 - yes“, „2 - somewhat yes“, „3 - maybe“, „4 - somewhat not“ up to „5 - no“. In a 5-point Likert scale, the mean value always expresses

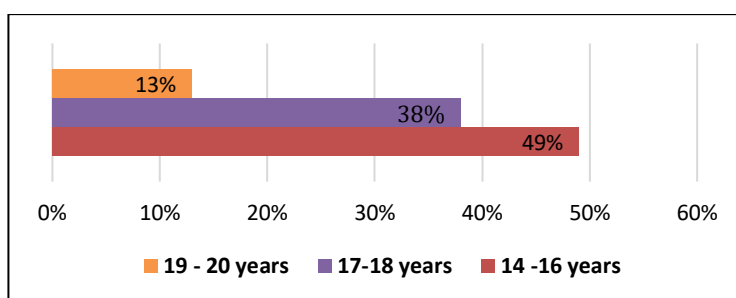
indecisiveness (e.g. „I cannot decide“ or „I agree but also disagree“), and it is the most frequent tool for measuring people`s attitudes and opinions (Chytrý & Kroufek, 2017). The questionnaire was anonymous. The complete questionnaire items together with answers are in Table 1 (Zsoldosová, 2020).

**Table 1.** Questionnaire survey and respondents` results (%)

No	The wording of the question	1	2	3	4	5
1.	Do you think that you acquired adequate theoretical knowledge in the field of Occupational Safety and Health (OSH) during your studies?	55	26	15	2	2
2.	Was the level of the theoretical OSH preparation complying with practice?	63	21	13	0	2
3.	Were you adequately informed about your rights from the OSH perspective?	61	20	8	8	3
4.	Were you adequately informed about your duties at the workplace from the OSH perspective?	75	20	3	0	2
5.	Did you meet with good practice examples during your studies on avoiding accidents in your study field?	40	26	13	7	14
6.	Did you train safe ways how to operate machines or hand tools in practice?	66	19	7	5	3
7.	Was the obtained information adequately understandable for you?	68	21	9	0	2
8.	Did you meet with cases of alcohol drinking at your workplace?	10	1	6	7	76
9.	Was the result of risk assessment at practical work part of the training?	29	12	26	10	23
10.	Do you know which risks are the most significant in your profession?	45	19	15	6	12
11.	Do you think that your working conditions are satisfactory from the OSH perspective?	69	15	13	1	3
12.	Do you agree with the following statement: „Keeping OSH regulations contributes to making your work more efficient, decreasing the number of work accidents and the incidence of occupational illnesses? “	59	13	15	6	7
13.	Do you know which personal protective equipment you have to use at work?	73	17	8	1	1
14.	Do you consider your workplace satisfactory to your needs and performed work?	73	11	8	4	4
15.	Was the OSH training attractive and interesting?	25	13	31	12	19
16.	Do you know what to do in the case of an accident?	54	22	16	1	7
17.	Were you demonstrably examined in legal regulations before taking up your work (e.g. with a test or examination)?	57	13	16	1	13

### 3 Results

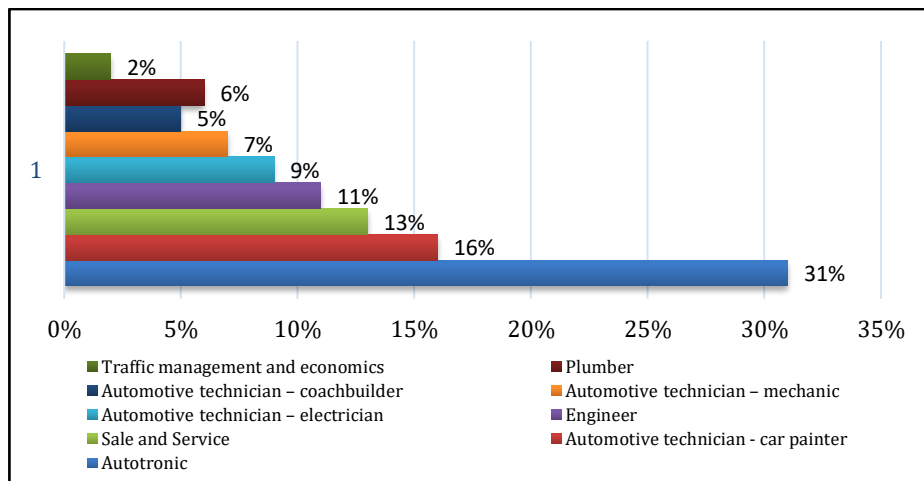
In our research participated pupils studying in four-year or three-year study fields and one pupil from the post-secondary study. There were first graders, second graders and third graders. Out of 13 study fields provided at school, in our questionnaire were pupils from eight study fields. Figure 2 depicts the age groups of pupils who filled in our questionnaire.



**Fig. 2.** Age range of respondents participating in the questionnaire survey

49 % of the youngest pupils participated in our questionnaire survey. The least interested were the oldest pupils (13 %). According to the obtained results, our respondents were pupils from four-year study fields. All pupils are included in the dual education system.

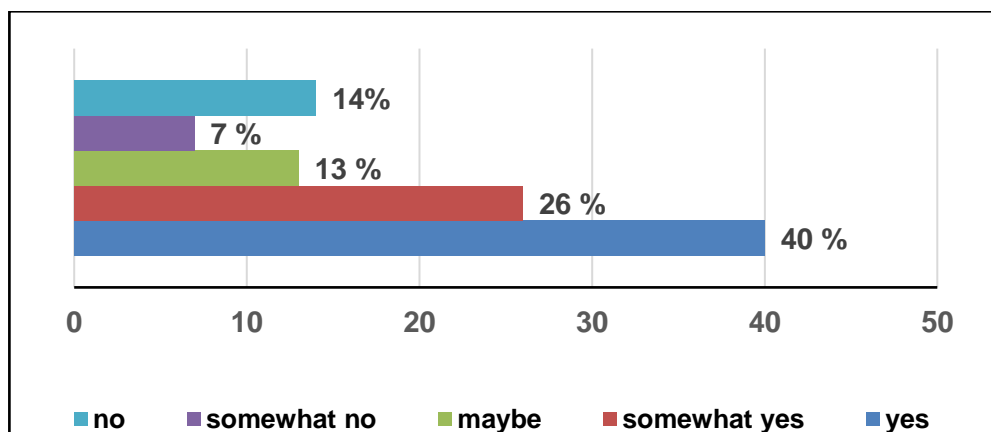
Figure 3 depicts the percentage participation of respondents according to their study fields.



**Fig. 3.** Respondents participating in the survey according to their study fields

From the results mentioned above, it is evident that pupils are primarily interested in the profession of an autotronic. When they successfully finish their studies, pupils preparing for this profession become qualified workers who have general educational bases joined with vocational theoretical knowledge, and within the dual education, they also acquired practical skills. When these pupils pass adequate introductory schooling and practice, they can independently perform various automotive industry activities. They are employable and required in the labour market.

More than 80 % of respondents answered positively to the first three questions concerning the OSH theoretical knowledge quality. To the fourth question with the wording „Were you adequately informed about your duties at the workplace from the OSH perspective?“, up to 95 % of respondents answered „yes“ or „somewhat yes“. However, to the following question „Did you meet with good practice examples during your studies on avoiding accidents in your study field?“, we did not obtain clear answers from pupils (Fig. 4).



**Fig. 4.** Respondents answered (%) the question “Did you meet with good practice examples during your studies on avoiding accidents in your study field?”

13 % of pupils do not know about good practice examples as a motivation for their work. 21 % of pupils mention that they were not informed about good practice examples as a tool for preventing accidents. The European Agency for Safety and Health at Work (OSHA) has prepared a series of interesting short films for educators, focusing on specific areas, which can also be used in practical training (<https://www.napofilm.net/en/learning-with-napo/napo-for-teachers>). It is important to provide safety training for young people provided by employers` lecturers who adapt the didactic tools and choice of methods so that the lectures are engaging, interactive and age-appropriate.

In the following two answers, respondents confirmed that they were trained how to operate machines and hand tools and that these pieces of information were understandable for them.

In question no.8 concerning alcohol drinking at the employer`s workplace, 11 % of respondents confirmed having a negative experience. This fact is in complete contradiction with the OSH regulations. This offense is classified

as a severe offense. It is the reason for the termination of the employment relationship in the case of its confirmation.

Within the OSH training, pupils of secondary vocational schools should learn how to identify possible risks and know how to minimise them. This obligation arises from the OSH legislation. For this reason, question no.9 focused on the analysis of acquired knowledge from the OSH training. Pupils meet with new technological equipment, changes in working conditions, and changes in used materials, proper production processes, or work procedures during practical lessons. For this reason, pupils should be able to follow these changes so that they could fulfil their new working tasks and, primarily, they should cope with these changes safely. Thus, they should be able to recognise and assess all possible risks. The risk assessment at the pupils` workplaces for vocational preparation must not be absent in the training`s contents. One of our recommended measures is the inclusion of this lack in pupils` education and formation.

The answers to question 10 are given in Fig.5.

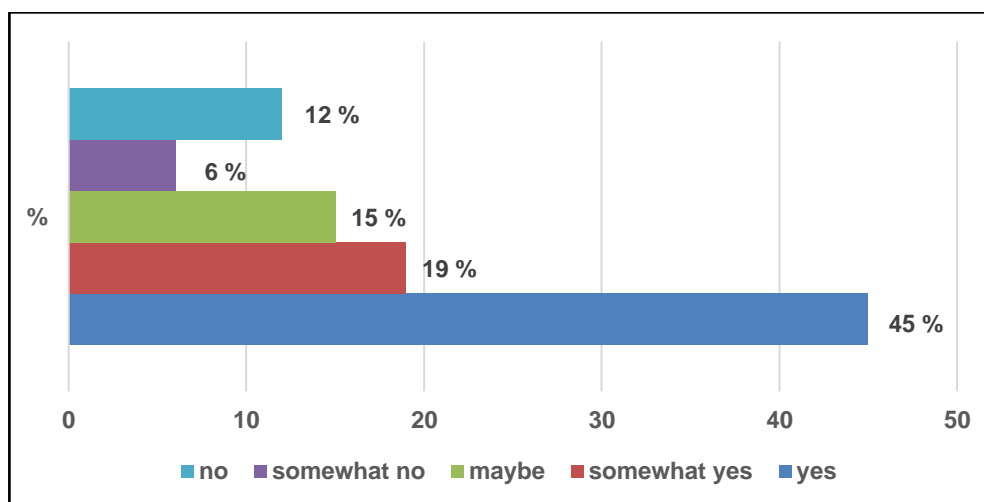


Fig. 5. Respondents answered (%) the question “Do you know which risks are the most significant in your profession

Subsequently, in their answers to the following question about whether they can identify the most significant risk at work, 64 % of respondents said they know it, 15 % of pupils were not sure about it and 18 % did not know this risk. If they do not know what hazard they are exposed to, they cannot prevent this risk. In this way, their safety is at risk, and the safety of other people at the given workplace too. Thus, it is crucial to improve the OSH education aimed at pupils from secondary vocational schools. OSH education should focus on their knowledge of the most significant hazards and risks arising from them.

84% of pupils evaluated working conditions as satisfactory. 72 % of respondents agreed that keeping legal regulations in the OSH field contributes to decreasing occupational accidents and illnesses. Pupils answered question no.13 positively, where up to 90% of respondents knew what personal protective equipment they must use at work.

They also answered question no.14 positively. Here respondents more or less positively evaluated the quality of the environment where they perform their work activity.

However, the question concerning OSH training`s attractiveness is not attractive or interesting from the pupils` perspective. Only 38 % of pupils answered this question positively. 31 % of respondents could not decide, and the same percentage of pupils marked it negatively. The obtained results point to the fact that training designed for young people should be attractive. It should be adjusted to this target group's age and needs, employing available modern educational tools and good practice examples.

The following question about the first aid confirmed that 66 % of respondents would probably know how to provide the first aid. Despite this fact, 34 % of pupils did not know or were not sure if they could provide the first aid in case of emergency.

In their last answer, 70 % of respondents mentioned that they had an examination about their OSH knowledge, 14 % of pupils said their knowledge was not verified, and 16 % do not remember it.

The survey found the following positives regarding the initial training of students before entering the workplace:

- they acquire theoretical knowledge in the field of Occupational safety and health at work, including their rights and obligations,

- part of the training is also preparation for a specific place of work, including the operation of machines, tools and equipment,
- they are aware of their rights and obligations,
- they consider their workplaces to be satisfactory,
- they can provide first aid in the event of an accident,
- they use appropriate personal protective equipment.

However, the following issues were identified from the responses:

- the training is not interesting enough, examples of good practice are lacking and probably not adapted to the age category of the pupils,
- many respondents do not know the result of the risk analysis that forms the basis of the practical training,
- many students are unable to identify the most significant hazards at work.

According to the authors (Kordošová & Urdziková), it can be stated that secondary schools in the Slovak Republic lack a subject that would lead to a culture of safety in the context of preparation for future professions. Companies' educators are oriented by their educational activities on adults. Didactic materials and methods and forms of training may not correspond to adolescents entering dual education. In previous studies (Tureková & Bagalová) it was also found that the results of risk management are missing in the study documents.

## 4 Conclusions

A positive finding of the survey was that students are satisfied with the skills they will acquire during the initial training. However, they lack knowledge of risk technology, first aid and do not lead to the significance and thus the consequence of risks at work. For this reason, it is necessary to introduce a separate school subject OSH at secondary vocational schools for pupils in the future profession. Students should know the basic principles of protecting their health and the health of their colleagues. At the same time, they should have a thorough knowledge of work safety with various means, tools, machines and technologies.

Introductory OSH training and re-training are under employers' responsibility. However, there arises a question about their adjustment to pupils' needs. There is a lack of high-quality schooling materials too. If there were an OSH subject included in the theoretical education, pupils would know the fundamental OSH regulations before starting their practical lessons, and employers could spend more time dealing with specific safety measures concerning the given workplace.

## 5 Acknowledgment

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