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**INTEGRATED DIDACTIC WORKPLACES – COSTS NECESSARY
FOR THEIR ESTABLISHMENT**

The paper deals with integrated didactic workplaces and financial demands on their establishment. The first part describes integrated didactic workplaces. In the second part, as an example, the author handled the equipment of the manual machining workshop and the turning workshop with the costs of their installation. At the end of the paper, the sum of the basic equipment of each workshop is summarized. The total costs of setting up school workshops for departments with codes 23 and 24, machinery and other metalworking production is approximately CZK 29,868,000.

Keywords: *integrated didactic workplaces, school workshops, secondary vocational school.*

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**ІНТЕГРОВАНІ ДИДАКТИЧНІ РОБОЧІ МІСЦЯ – ВИТРАТИ,
НЕОБХІДНІ ДЛЯ ЇХ СТВОРЕННЯ**

У статті розглядаються інтегровані дидактичні робочі місця та фінансові вимоги щодо їх створення. Перша частина описує інтегровані дидактичні робочі місця. У другій частині, як приклад, автор обробляв обробку цеху та токарного верстата з ціною їх установки. У кінці статті підсумовується сума основного обладнання кожного семінару. Загальна вартість створення школи для профспілок з кодами 23 і 24, машинобудування та інше металообробка складає близько 29 868 000 чеських крон.

Ключові слова: *інтегровані дидактичні робочі місця, шкільні семінари, середня професійна школа.*

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**ИНТЕГРИРОВАННЫЕ ДИДАКТИЧЕСКИЕ РАБОЧИЕ МЕСТА –
ЗАТРАТЫ, НЕОБХОДИМЫЕ ДЛЯ ИХ УЧРЕЖДЕНИЯ**

В статье рассматриваются интегрированные дидактические рабочие места и финансовые требования к их созданию. Первая часть описывает интегрированные дидактические рабочие места. Во второй части, в качестве примера, автор обрабатывал механическую обработку цеха и токарного станка со стоимостью их установки. В конце статьи суммируется основное оборудование каждой мастерской. Общая стоимость создания школы для профсоюзов с кодами 23 и 24, машинами и другим металлообрабатывающим производством составляет приблизительно 29 868 000 чешских крон.

Ключевые слова: интегрированные дидактические рабочие места, школьные мастерские, среднее профессиональное училище.

Introduction. Integrated didactic workplaces serve to teach professional subjects and foreign-language preparation of pupils at vocational schools. Their equipment is diverse and cost-intensive. From the point of view of the school education project, we must ensure the pupil's knowledge and skills. From this perspective, it is an all-society affair. Putting funds into education is an investment for the future. The company needs experts whose preparation has shown to be highly needed in recent years. Today, companies require professionals in all technical expertise and crafts. Labour offices invest large amounts of funds in retraining.

Integrated didactic workplaces. We understand the integrated didactic workplace as an assembly of suitably composed material didactic means for the desired type of specialized study room (Hrmo, Kučerka, Křištofiaková, 2014b). Additional specialized workplaces, such as laboratories, specialty schools, school workshops for secondary schools, etc. should be taken into account here too as well as specialized workplaces for gifted pupils and special workplaces for integrated and disabled and handicapped pupils . We will not describe the last two named workplaces.

Integrated didactic workplaces are equipped with technical devices and teaching aids according to the nature and needs of the workplace. Different types of workplaces require different technical equipment and teaching aids. Taking into account, for example, high school workshops at the MSc in metalworking or mechanic adjustment, their equipment is primarily provided by real machine tools and CNC machines with basic tools and accessories for eachpupil in the group. Each pupil after the assignment assigns the necessary tools and preparations to the tool and the accessories. The Vocational Training Teacher has the board and a chalk, the machines and the drawings of the parts that the pupil will produce and the material for the production of the component.

Integrated didactic workplaces were suggested by prof. Driensky in his publications "Didactic Technology" (1998, pp. 50–57) and "Engineering Pedagogy" (2007, pp. 155–165).

On the basis of my own experience gained in professional practice outside the education and training sector at secondary vocational school as well as at VA SNP Liptovský Mikuláš (1993–1995) and especially at the current workplace of VŠTE České Budějovice at the current creation of VŠTE laboratories and teaching at the professional workplaces created at SOŠ and SPŠ in the South Bohemian Region I created a model of integrated didactic workplaces (Figure 1). This model is aimed at schools with engineering study or apprentice departments. Teaching at secondary industrial schools and secondary vocational schools takes place in three basic sectors. General subjects are generally taught in basic classrooms.

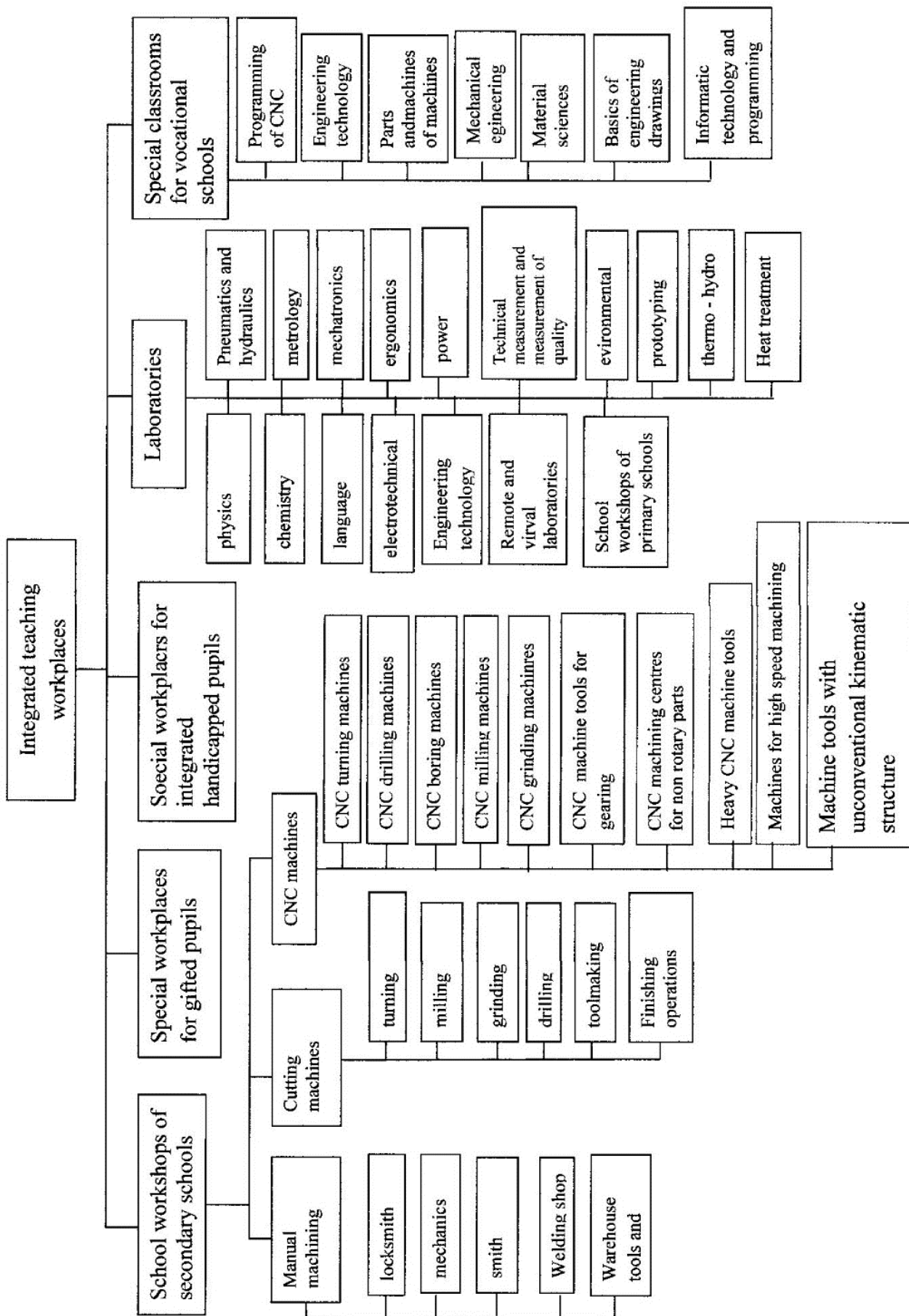


Figure 1. KD Model of integrated didactic workplaces

For the needs of the paper we will deal with professional training in school workshops for the study department mechanic setter. In the first year, the lessons are focused on manual machining. In the second year students are familiar with working on machine tools and the third year is focused on programming for CNC machines. In the last year students work in the company.

Equipment of school workshops according to Fig. 1 is divided into three categories:

- 1) manual machining workshops;
- 2) machine machining workshops;
- 3) workshops of CNC machining.

Workshop equipment is based on the names themselves. According to the standard in one group there are max. 12 pupils. The number of workplaces in schools is set up according to the needs and financial possibilities of the school. Each pupil must necessarily be equipped with machines, instruments, gauges, tools and accessories. Financial quantification is the subject of the second part of the paper.

Analysis of financial needs for the establishment of school workshops.

Education at secondary schools in the Czech Republic is organized according to Act No. 561/2004 Coll. The Law on Preschool, Primary, Secondary, Higher Vocational and other Education (Education Act) and other decrees and regulations of the Minister of Education of the Czech Republic.

Education at secondary schools in the Slovak Republic is organized according to Act No. 245/2008 Coll. On the Education and Training Act (Education Act) and on amending and supplementing certain laws of other decrees and regulations of the Minister of Education of the Slovak Republic. The Minister of Education publishes pedagogical and organizational instructions for the organization and security of the school year for the current school year.

In our paper we are dealing with integrated didactic workplaces as a category of school workshops. Practical lessons are held there. Practical lessons are dealt with in Sections 12–15 of the Ministry of Education, Youth and Sports of the Czech Republic no. 13/2005 Coll., which includes training, exercises, teaching practice, professional practice and artistic practice. Vocational training consists of acquiring basic skills, activities and habits, manufacturing of products, performing services or performing works of material value. In vocational training, in the daily form of education by the teaching unit, the teaching day is carried out at the school or in the school facility by the teacher of the vocational training. Practice training of pupils at the workplace of natural or legal people is also done for the guidance and supervision of instructors. The instructor runs at the same time no more than 6 pupils. Exercise is part of practical lessons in subjects that enhance pupils' professional education and training. Classroom practice, professional experience and artistic practice are conducted within the scope of the Framework Educational Program in schools, in school facilities or in workplaces of individuals or legal entities as part of a block

instruction, usually within weeks. The organizational arrangements are determined by the school head according to the specific field of education.

For the purpose of this paper, we will deal with the category of school workshops which, according to the KD model (Figure 1), are divided into parts of manual machining, machining and machining on CNC machines.

Tab. 1 and 2 show examples of a workshop for manual machining and turning workshops for 12 students and financial costs for their establishment. In tab. 3 there are shown the costs of setting up integrated didactic facilities according to the KD model in the category of school workshops.

Table 1

Workshop of manual machining

Equipment, machine, tool	Number	Financial costs
Working table	12	300000,-
Hand bender	1	7000,-
Table bender	1	8000,-
Electric hand drill	1	2000,-
Measuring marker board	1	21000,-
Pillar drill	1	40000,-
Double-shot grinder	1	20000,-
Sheet metal scissors	2	22000,-
Lever Shears on Sheet	1	73000,-
Band Saw	1	20000,-
Corner scissors	1	25000,-
Set of tools and gauges	12	50000,-
Σ		585000,-

Table 2

Turning workshop

Equipment, machine, tool	Number	Financial costs
SUI 80/1500	1	360000,-
SU 18	1	170000,-
SN 32	1	30000,-
SU turret	1	180000,-
SU 32/100	1	270000,-
SU 28	1	30000,-
SU 50/2000	1	140000,-
SU 18 with a pantograph	1	330000,-
SUI 50	1	120000,-
A training lathe	1	100000,-
SU Brnardo	1	170000,-
Control room	1	50000,-
Set of tools and gauges	1	100000,-
Σ		2229000,-

According to Tab. 1 we can see that the costs of the basic equipment of the manual machining workshop in the basic standard equipment is about 585000,- CZK.

In tab. 2 we see that we need min 2229000,- CZK for the equipment of the turning workshop. In tab. 3 is a real sum of costs for the basic equipment of school workshops for metal machining departments, mechanical adjustment of CNC machines and operation of CNC machines. Basic equipment requires approximately 29848000,- CZK. As it is shown in Figure 1, we are talking about five categories of integrated workplaces. In order to equip all workplaces, including workplaces for integrated and physically handicapped workplaces, it is necessary to spend about 120000000,- CZK. These costs can not be covered by the resources of the Ministry of Education, but each director must receive funding from projects, the private sector and sponsorship.

Table 3

Costs of workshop equipment

Total cost of equipment for school workshops	
Equipment, machine, tool	Financial costs
Handpiece workshop	585000,-
Smith workshop	224000,-
Welding workshop	869000,-
Turning workshop	2229000,-
Milling workshop	4855000,-
Grinder workshop	2685000,-
Tool workshop	2458000,-
Finishing operations workshop	2158000,-
Workshop of CNC machines	12875000,-
Tool storage and accessories	100000,-
Σ	29868000,-

Conclusion. Integrated didactic workplaces serve to gain and develop pupils' knowledge, skills, habits, experiences and attitudes while preparing for the job. The funds invested give the presumption that pupils receive a good foundation for further professional development. The equipment of integrated didactic workplaces at each school differs specifically. It differs according to the school's focus, school options, teacher orientation, etc. At the same time basic equipment of workshops, laboratories, classrooms, etc. for the same department is the same everywhere.

The paper deals with equipment of departments with codes 23 and 24 engineering and other metalworking. Considering the needs of these study departments, it is obvious that the basic equipment for setting up offices is about 12000000 CZK.

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