



STUDY ON PROFILES,
TRAINING NEEDS AND
CHARACTERISTICS OF THE
TEACHER-ENTREPRENEUR
(DIGITAL TEACHERPRENEUR)
IN THE CZECH REPUBLIC



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0. ABOUT THE PROJECT AND THIS DOCUMENT.

Digital Entrepreneurship: Innovative Teacher Training (Digital Teacherpreneur) is project funded by Erasmus Plus as a Strategic Partnership in the field of vocational training to support innovation. It aims at the development, transfer and implementation of innovative practices improving competences and skills of educators in the field of entrepreneurship, particularly in Digital Entrepreneurship.

Professionals in education and training who participate in initial and continuous professional development training schemes are the project's main target group/ audience. They, as well as entrepreneurs in digital focused companies, are invited to participate in a short interview helping us find key learning gaps and needs as basis for the development of teaching/ learning material.

The aim is to better know about the learning needs of these innovative teachers regarding e-tools and implementation also in the business world. Valuable input could come from experienced teachers, business representatives (entrepreneurs applying new technology or offering new e-services or chamber representatives), ICT experts, policy stakeholders, other.

1. TRADITIONAL ENTREPRENEURSHIP TEACHER: A BACKGROUND STUDY.

1.1. Overview of the Czech Education System

Responsibility for schools in the Czech Republic is distributed among the Ministry of Education, Youth, and Sports, regional education authorities, and municipalities. The Ministry sets policies and assesses the state of the development of the education system. For example, the Ministry defines compulsory educational components, is partially responsible for funding public schools, and oversees the school register, a tool used to ensure that all students have access to appropriate educational opportunities. Among other responsibilities, the Ministry oversees institutions that provide professional development for teachers. The Ministry also retains direct control of several institutions related to institutional or preventive care, such as orphanages, detention centers for juveniles, and schools for students with physical needs or impairments. The Czech School Inspectorate serves as the main state authority responsible for monitoring school quality (at the preprimary, primary, secondary, and post-secondary levels).

Between 2001 and 2003, regional education authorities were established, fundamentally decentralizing the education system. The Ministry of Education, Youth, and Sports retained its policymaking responsibilities but transferred administrative responsibilities to the regions. After decentralization, the regions assumed responsibility for secondary schools and post-secondary technical schools.

Municipalities are responsible for nursery schools and for basic schools, which provide compulsory primary and lower secondary education, and guarantee their funding (except for salaries and instructional equipment, which are funded by the central government indirectly via regional education authorities).

Some schools are run by private entities or denominations, and are required to fulfill a set of criteria in order to obtain state authorization and receive state funding.

Nursery schools provide education usually for students ages 3 to 6, as part of preprimary education. Attendance is not compulsory, but 88 % of children in this age group enroll, rising to 91 % of 5-year-olds (the year prior to compulsory schooling). This final year of preprimary education is free of charge, and children have a legal right to attend. The availability of care for children younger than 3 is quite limited. The percentage of 2-year-olds attending nursery school is 34 %.

Basic schools provide nine years of education at the primary and lower secondary levels, and attendance is compulsory. The primary level lasts five years for students ages 6 to 11, and the lower secondary level lasts four years for students ages 11 to 15.

At the end of the primary level (fifth year), students may leave basic school to start an eighty-year track of general secondary school (eight-year gymnasium) or of dance conservatoire, where they may complete their compulsory education within the first four years of study (by age 15).

Similarly, at the end of the seventh year of basic school, students may start a six-year gymnasium after passing an entrance examination set by the school. Approximately 12% of students study in a multiyear gymnasium or dance conservatoire. All public basic schools are free of charge.

Secondary education

Building on the basic education, secondary education develops knowledge, skills and competencies of the students and prepares them for further study at universities and tertiary technical schools, or for a given occupation or working tasks at the labour market. It allows both students under 18/19 years as well as adults to gain education.

Secondary education has either a general or vocational focus, and is completed by the Matura exam (maturita), apprenticeship certificate, or a final examination. It is offered at secondary general schools (gymnázium), secondary technical schools, secondary vocational schools and conservatories.

Secondary schools offer pupils knowledge, skills and competencies necessary to pursue an occupation or group of occupations or work activities on the labour market. At the same time, it develops the general knowledge, skills and key competencies necessary for their private, civic and work life, as well as for their continuing education.

Secondary schools create their school curricula in accordance with the national curricula developed for all fields of study at secondary schools by the Ministry of Education, Youth and Sports. The student's educational path is determined by national curricula that define objectives, the content and conditions of education in more than 279 fields of study. Schools develop their own school curricula which take into account the school's specific conditions and objectives.

Levels of secondary education

- Secondary education: the student must successfully complete the educational programme in the course of 1 or 2 years of full-time study. This level of education provides neither an apprenticeship certificate, nor a Matura certificate (maturita).

- Secondary education with apprenticeship certificate: the student must successfully complete the educational programme in the course of 2 or 3 years of full-time study, or in the course of a shortened programme which provides proof of secondary education with apprenticeship certificate.
- Secondary education with Matura exam (maturita): the student must successfully complete the six-year or eight-year programme, an educational programme consisting of four-year full-time study, a two-year follow up courses, or a shortened educational programme to receive secondary education with Matura exam. Private schools, both primary and secondary, were first established in 1990 (private universities in 1999). These schools are mostly secular and typically are established by for-profit or nonprofit grant-aided organizations. Non-governmental basic schools (private and denominational schools) represent only 3.8 % of basic schools and educate 1.7 % of primary school students. In contrast, non-governmental secondary schools comprise 25.8 % of all secondary schools and educate 13.3 % of secondary school students.

Private schools receive a state contribution toward their operating costs. This funding is formula-based, and the method of calculation is still under development. School fees and other private sources cover capital expenditures and rent.

1.2. The teaching workforce in the Czech Republic and the teachers' education model.

An estimated 100 000 teachers work in basic and secondary schools across the Czech Republic. The number of teachers has declined over the past decade, dropping by 11% between 2005/06 and 2013/14. The greatest decline is seen in upper basic schools and secondary schools, with a decrease of 18% and 15% respectively between 2005/06 and 2013/14, while the size of the teaching workforce in lower basic education actually expanded by 5% over the same period. Changes in the size of the teaching workforce generally follow trends in student enrolments over this period.

Because of the decline of number of teachers, Czech teachers belong to the ones who have to take care of the biggest number of students in their class – 19.1, compared to EU average of 17.7. It is also needed to say that the Czech Republic has one of the highest shares of women among teachers with 95%¹.

¹ EUROSTAT. 15 pupils per teacher in EU primary schools. 2017. <https://ec.europa.eu/eurostat/web/products-eurostat-news/-/DDN-20190911-1?inheritRedirect=true&redirect=/eurostat/home>

Regarding the teaching staff skills², school leaders report low level of shortages of quality and/or well performing teachers: 27% compared to the 38% average in the OECD countries. However, it doesn't seem to be consistent with the number of Czech teachers who have completed a teacher education training programme (77%), compared with the 90% average in the OECD countries.

The Czech Republic has some instances of out of field teaching in mathematics, science, ICT and foreign languages, although it is relatively low compared to the OECD average. For example, in literacy it is 3% compared to 6%, and in modern languages 8% versus 11% respectively. This issue is most prominent in science where 10% of science teachers report not being qualified in the Czech Republic³.

Initial training.

Teachers in basic schools (integrating primary and lower secondary education) are educated and trained as part of their university studies. Primary school teachers (Grades 1 to 5) are required to hold a master's degree, which generally takes five years to complete at a school of education (typically comprising a three years bachelor's degree program followed by a two year master's degree program). Graduates of these programs are qualified to teach all subjects at the primary level. Some programs allow prospective teachers to specialize in a chosen subject. Teacher preparation includes a training program (including in-school placement) that usually lasts 6 to 12 weeks, depending on the university.

Teachers of general subjects at the lower secondary (Grades 6 to 9) and upper secondary (Grades 10 to 13) levels also are required to hold a master's degree. Most secondary school teachers are specialists, however, and usually are qualified to teach at least two subjects.

Secondary school teachers are educated at universities, either at schools of education or at faculties (or colleges) and focus on the subject they wish to teach (e.g., natural sciences, mathematics, or physics). Teacher preparation at this level also includes a training program (including in-school placement lasting four weeks per field of study). A teacher who is fully qualified at the primary or secondary level also may teach outside his or her area of specialization at the discretion of the head of school. A teacher, upon completion of studies, is qualified at ISCED (International Standard Classification of Education) Level 7, and upon

²OECD REVIEWS OF SCHOOL RESOURCES: CZECH REPUBLIC 2016 © OECD 2016

³Mullis, I. V. S., Martin, M. O., Goh, S., & Cotter, K. (Eds.) (2016). *TIMSS 2015 Encyclopedia: Education Policy and Curriculum in Mathematics and Science*. Retrieved from Boston College, TIMSS & PIRLS International Study Center website: <http://timssandpirls.bc.edu/timss2015/encyclopedia>

passing a state final examination and defending his or her thesis, the teacher obtains a university diploma, a diploma supplement, and the academic degree of Magister (master).

In VET, those teachers who teach practical courses don't need a master level or university degree. For them professional education at a lower level is sufficient.

Ongoing Professional Development

After obtaining a master's degree, teachers are fully qualified to teach. The Czech education system does not offer any official induction program for fully qualified first year teachers; however, some schools provide their own induction program.

40% of teachers⁴ reported that a formal induction program was available at their school for all newly hired teachers, while 7% reported that training at their school was only available to recently qualified teachers. Some schools also offer mentoring.

The Czech School Inspectorate has reported that 87% of teachers at basic schools are fully qualified. Teachers who were not fully qualified and wanted to continue teaching were required (with few exceptions) to begin pedagogical education by the end of 2014 in order to obtain full qualification. Of the teachers inspected by the Czech School Inspectorate, 8% at the primary level and 10% at the secondary level completed the requirements for full teacher qualification in the 2013–2014 school year.

According to Act No. 563/2004, all teaching professionals are obligated to meet certain professional development requirements and are allowed to use up to 12 working days for professional development per school year. Professional development is offered by a large number of organizations. The Ministry of Education, Youth, and Sports accredits educational institutions and programs dedicated to professional development.

The head of school provides professional development for educational staff in line with a plan developed with the relevant trade union (if there is one at the school).

In-service training of education staff includes study programmes for unqualified teachers leading to formal teacher qualification, programmes leading to other qualifications (such as school counsellor – výchovný poradce qualification) or professional development courses (continuous education). It is delivered within the lifelong learning system at higher education institutions, in establishments for in-service training of education staff or other institutions accredited by the Ministry of Education, Youth and Sports, or this type of education can be gained through self-study.

⁴ OECD REVIEWS OF SCHOOL RESOURCES: CZECH REPUBLIC 2016 © OECD 2016

Based on data from the Teaching and Learning International Survey (TALIS) in 2013, 82% of Czech teachers attended at least one professional development activity in the 12 months period prior to data collection. Data collected by the Czech School Inspectorate in 2013–2014 show that 74% of inspected teachers at basic schools attended various courses and seminars, while 20% of inspected teachers did not attend any form of professional development.

The cost of professional development may be covered by the school (fully or partly) or by the participating teachers themselves.

Many Czech teachers (over 80%) report regularly participating in professional development activities. Teachers most frequently take part in short courses and workshops. Around one-third of teachers participate in a combination of formal mentoring, peer observation and/or coaching, which is just above the TALIS average. Less than 20% participate in a teacher network or research on a topic of interest, and few teachers (15%) undertake classroom observations at a different school each year. Specific indicators on formal mentoring (alone) show a bleak picture. Only 3% of teachers report having an assigned mentor, far below the 30% of school principals reporting that mentoring is for all teachers in the school⁵

1.3. Entrepreneurship education thus far

In the Czech Republic there is no official document defining entrepreneurship education. Therefore, no official definition is used and, in the place of it, three approaches are usually used by the experts in the Czech Republic when they deal with this topic: development of entrepreneurship competence as defined in the European Reference Framework for Key Competences in Lifelong Learning, education in financial literacy and training for companies start up and business management.

This section describes the strategical framework for entrepreneurship fostering in the Czech Republic and how the different approaches to entrepreneurship are embedded into school curricula, as well as the entrepreneurship education offer in informal and non-formal learning.

⁵ OECD REVIEWS OF SCHOOL RESOURCES: CZECH REPUBLIC 2016 © OECD 2016

1.3.1. Strategic Framework

The Czech Republic has a goal of increasing the number of young entrepreneurs up to 35 years of age within the Research and Innovation Strategy for Smart Specialisation 2014-2020 (RIS3 Strategy). However, it does not have any specific national strategy for the development of the entrepreneurship competence or an entrepreneurship mindset among young people.

The Policy Framework is focused on the support of medium and small enterprises (Law no. 47/2002 Coll. and State strategy to support small and medium-size businesses 2014-2020), but the youth entrepreneurship is not specifically mentioned there.

A number of National Strategies bring up entrepreneurship:

The National Innovation Strategy of the Czech Republic 2012-2020, includes a part devoted to changes in education regarding creativity, entrepreneurship and key competencies. It also stresses the importance of cooperation between schools and employers and the link between the system of vocational education and the labour market, and underlines the need to respect these elements during curricular reform and the establishment of the guidance system. ISCED levels 1, 2 and 3 are considered

The Strategy for Lifelong Learning in the Czech Republic 2007, emphasises the functional literacy of students and the development of key competencies.

The Youth Support Strategy 2014-2020, includes commitments for the transition of young people between school and work and for creating conditions for their smooth integration into the labour market

Back to the Top: The International Competitiveness Strategy for the Czech Republic 2012- 2020, includes a chapter on education, with an emphasis on the need for education to address independent creative thinking, the ability to continue learning and the ability to cooperate.

Furthermore, *the Education Policy Strategy of the Czech Republic up to 2020* recognises the need for common elements in the curricula at secondary education. This includes the recognition of skills and competences for young people to successfully enter the labour market.

And the *Long-term Education Plan 2015-2020* emphasises, in particular, the importance for education to contribute to sustainable development, highlighting economic aspect, the needs of the labour market and the role of active citizenship.

Concrete actions within this strategic framework are:

- the general introduction of validated tools for the diagnosis and development of entrepreneurship and soft skills, as defined by the National System of Occupations, at all educational levels, including teacher training to work with these tools.
- implementation of practice-based learning activities

However, no monitoring framework is currently in place and it is not possible to draw conclusions about the entrepreneurship teacher profile and the corresponding training needs. Regarding the profile some conclusions may be drawn from the way in which entrepreneurship and the related competences are included in the formal, informal and non-formal learning.

1.3.2. Entrepreneurship in the formal learning

In the national curricula, the following learning outcomes are defined:

- ✓ Entrepreneurial attitudes: self-confidence (ISCED 2) and sense of initiative (ISCED 1-3).
- ✓ Entrepreneurial skills: creativity (ISCED 1-2), financial literacy (ISCED 1-3), planning (general ISCED 3), organising resources (school-based IVET), managing/uncertainty risk (general ISCED 3), teamwork (ISCED 1-3).

Learning outcomes for Entrepreneurship Education, as well as educational areas, are defined in particular framework educational programmes. How the development of the individual outcomes is linked during the learning process is based on the decision of the individual school.

The Framework Educational Programme for General Secondary Education sets the following key competencies:

- learning competencies
- problem solving competencies
- communication competencies
- social and personal competencies
- civic competencies
- entrepreneurship competencies

Despite this, in the formal Czech learning system there are no separate specific subjects on entrepreneurship, but it is included in several compulsory or optional subjects.

In fact, entrepreneurship education is recognized as a cross-curricular objective at primary and secondary schools and they have autonomy in implementing these cross-curricular objectives into their education plans.

Entrepreneurial skills are integrated in the curricula as part of compulsory key competences, such as working competences and entrepreneurial competences at secondary education.

These competences are translated into compulsory subjects such as “Man and Society”, “Civics”, “The world of work” and “Basic of Civics”, as well as Social Sciences in secondary Education Schools.

In secondary education entrepreneurial teaching and learning is less well embedded, in part due to the existing demands placed on schools in terms of the main subjects covered.

Framework Curriculum Timetable for General Secondary Schools

Educational area	Educational field	Total number of teaching hours during the study	
Language and language communication	Czech language and literature	12	obligatory in each grade
	Foreign language 1 ¹⁾	12	obligatory in each grade
	Foreign language 2 ¹⁾	12	obligatory in each grade
Mathematics and its applications		10	obligatory in grades 1 to 3
People and nature	Physics	36	obligatory in grades 1 to 2
	Chemistry		
	Biology		
	Geography ²⁾		
	Geology		
People and society	Civic and social science essentials	X	during grades 1 to 4 ³⁾
	History		
	Geography ²⁾		
People and the world of work		X	during grades 1 to 4 ³⁾
Art and Culture	Music	4 ⁴⁾	obligatory in grades 1 and 2
	Fine arts		
People and their health	Physical education	8	obligatory in each grade
	Health education	X	during grades 1 to 4 ³⁾
Information and communication technology		4	during grades 1 to 4
Optional educational activities		8 ⁵⁾	obligatory in grades 3 and 4
Cross-curricular themes		X	during grades 1 to 4 ^{3), 7)}
Disposable teaching hours		26 ⁶⁾	fully in discretion of school head
Total compulsory number of teaching hours		132	

Figure 1- FUENTE: EURYDICE https://eacea.ec.europa.eu/national-policies/eurydice/content/teaching-and-learning-upper-secondary-education-4_en

Actually, most of the entrepreneurship teaching is offered by business high schools as programs focused on companies' start up and business management, more than training for competencies development.

Nevertheless, entrepreneurship education has been slowly expanding its reach within the Czech Republic's education system. It is now part of the General Education System for basic education, which specifies that upon completion of elementary education, pupils should know how to prepare a basic business plan and understand the essence, goals, and risks of entrepreneurship.

The Centre for Practice Enterprises (Centrum fiktivních firem), a member of the international network Europen-PEN International, receiving government funding, offers students in upper secondary vocational education the opportunity to manage a 'practice enterprise' in order to develop their entrepreneurial skills. These companies are set up by students under the supervision of the teacher and in co-operation with the Centre.

But so far, schools offer entrepreneurship training activities mainly by collaborating with Junior Achievement CZ.

Junior Achievement is the only organization in the Czech Republic that has developed and applied a long-term comprehensive concept of economic education for primary, secondary and tertiary professional schools.

Their programs are a fully functional tool for teaching economic subjects and they are fully in line with FEP BE and FEP G, fulfill a number of key competencies, have interdisciplinary character and integrate most cross-cutting themes.

All educational programs of JA CZ are accredited by the Ministry of Education, Youth and Sports.

All schools in the Czech Republic have the opportunity to teach JA Czech programs.

The partner for cooperation is the school as a legal entity, not individual teachers or students. Programs are taught usually for one school year (if the school classifies the JA program as a separate subject) or, depending on the individual needs of the school, for less than one school year within an existing subject.

The subject is taught by a school teacher, who uses the JA Czech methodological and teaching materials to create modern, practically oriented economic teaching subjects, which schools most often classify within the so-called compulsory-optional subjects.

JA materials can also be used to enrich existing subjects with interactive learning (teamwork based on practical activities and case studies, computer simulations and e-learning). JA materials are in Czech and are adapted to the economic, social and legal conditions in the Czech Republic.

Interested schools have to fill in the application form on the JA website. The Program Manager will send a "Binding Application" to the school for the program, on the basis of which it will be sent to the school an invoice for payment.

JA Czech works on a non-profit principle. Methodological and educational materials for individual JA Czech teaching modules are partially covered by registration fees and teaching materials are provided free of charge. After paying the registration fee, the teacher receives access to the teaching materials. The purpose of registration fees is not to cover the production and operating costs of the organization (which are many times higher), but only to increase the co-responsibility of schools for the use of JA Czech materials.

In addition to methodological and teaching materials, JA Czech provides schools with other opportunities for student development during the school year - such as lectures by practitioners, cooperation with schools abroad, and a wide range of competitions at national and international levels. Around ten thousand students participate in JA Cz programmes every year.

A CZECH SUCCESS CASE



CZECH REPUBLIC

OA, SOŠ a JŠ Hradec Králové

There are three basic pillars to our school education: language education, administrative skills training and entrepreneurship education. Our school offers four fields of study: economics with advanced English language teaching, business, and social care and public administration. At the core of entrepreneurship education is the teaching of the JA Company Programme in the third year as a compulsory subject. This connects with a number of events, especially the traditional pre-Christmas fair of JA companies with international participation. Our JA companies also participate in competitions run by JA Czech such as e-shop, annual report, and JA Titan. Another important event is the organization of financial literacy days for pupils of elementary schools, who can learn about basic economic issues while taking part in a competition prepared by our students. Business and entrepreneurship is also taught using fictitious companies, for which the school organizes a fair. Our students participate in the international fair in Prague and at regional fairs. The school has been involved in an ERASMUS project focused on the exchange of experience between Czech and Slovak fictitious companies. Finally, our economic teachers are part of the independent group "Teachers from Mars", who organize project days and conferences.

<https://www.oahk.cz> THE ENTREPRENEURIAL SCHOOL AWARDS 2018 a JA Europe initiative supported by Siemens

1.3.3. Entrepreneurship in non-formal and informal learning

During the period 2014–20, the national government supports entrepreneurship training, business counselling and coaching through a range of initiatives that are financed by the European Social Fund and the Operational Programme Employment (2014–20). The national government supports the acquisition of entrepreneurship skills with different approaches for different target groups:

- Registered unemployed people can access business counselling, entrepreneurship training or re-training related to self-employment through the Employment Office;
- New entrepreneurs can access specialised business counselling within the Operational Programme Enterprise and Innovation for Competitiveness (Counselling sub-programme)

Most of the entrepreneurship training and individual support offered in the Czech Republic are delivered by non-governmental organisations and tend to focus on the development of a business plans and feasibility analysis.

Projects aiming at the development of entrepreneurial skills are also financed from various other sources, e.g. the funds of the Office of the Government of the Czech Republic and the Government Council for Equal Opportunities of Women and Men, the budgets of municipalities, foundations, etc.

The private and non-governmental sectors also offer entrepreneurship training and business advisory services (including entrepreneur and manager coaching and mentoring) sometimes at a fee.

Similarly, there are approximately 50 business incubators throughout the Czech Republic that provide an integrated support offer, most of which is directed at improving entrepreneurial skills.

There are several (Youth) NGOs focusing their values and educational path on the importance of problem-solving competencies and other relevant skills.

Some of the Youth NGOs and initiatives are directly focused on supporting young entrepreneurs and entrepreneur education, such as Junior Achievement, Junior Chamber International Czech Republic, and they usually receive at least some support from public resources or EU programmes for their activities.

A very active role is played by the Association of Small and Medium-Sized Enterprises and Crafts CZ which is running its own successful initiative without any public support. “*Svou cestou*

- *Young business*” which is focused on advising and helping young people who want to start their own entrepreneurship for real.

There are other private entities and individuals working with the topic e.g. www.mladypodnikatel.cz (Young Entrepreneur).

1.4. Entrepreneurship Teachers in the Czech education system: Professional Profile and Training Resources.

The Czech innovation strategy highlights the importance of teacher training to boost entrepreneurship education as key element for a sustainable development. This recognises the primary role that teachers play in the delivery of entrepreneurship education and the significant focus that is placed on their training and support.

Likewise, there is abundant specialized literature on the “entrepreneurship teachers”, their importance and appeals to meet their needs in terms of resources, institutional support and training.

In 2017, an article published in *Acta Educationis Generalis*⁶ proposed this profile:

“A [*entrepreneurship*] teacher is a mediator, a facilitator who is providing assistance and guidance. Teachers are managing the activity of the students, they are just co-ordinators, facilitators, coaches, guiding helpers. They give feedback and correct pupils. Teachers should be innovative, dynamic, communicative and critical, should explore different ways of teaching by experience and simulations in order to develop critical thinking, reflection but also creativity and curiosity for learning. The teacher as a tutor explains to the pupils the real economy process and create situations like in real life”

Table 1

Changing the role of teacher and pupil

<u>The teacher's roles</u>	<u>The pupil's roles</u>
Coach for pupils/students' supervisor, co-organizer	Learner
Facilitator, communicator observer	Problem solver
Leader of the pupils/students	Communicator, debater
Activity coordinator and class manager	Team leader
Creator of positive school and class climate/learning environment	Team member

⁶Education for Entrepreneurship – A Challenge for SchoolPractice. Alena Jůvová – Tomáš Čech – Ondřej Duda. *Acta Educationis Generalis* volume 7, 2017, issue 3

The article also specifies the appropriate teaching methods and pupils’ activities which the entrepreneurship teachers have to master:

“The teachers use attractive, non-traditional and active teaching methods and effective strategies (simulations, role play, brainstorming, creative writing, graphics, storytelling, self-regulated learning, enquiry, experiment). For support of pupils, they also need career counselling for pupils, help in making decisions about profession, tutoring, mentoring, coaching, support and supervision. For the development of entrepreneurial competence, financial literacy and soft skills, modern technologies and learning tools (ICT, social networks, edu-clips, MOOC, see www.I33n.eu) are used. Teachers try to find and use the institutional memory and knowledge and experience of excellent top management, progressive leaders and seniors. Inspiring personalities could also be used in the narrative autobiographies.”

Table 2

Teaching methods and strategies used by teachers and pupils’ activities in entrepreneurial education

<u>Progressive teaching methods</u>	<u>Pupils’ activities</u>
experiential learning	Inquiry, individual work
Experiment	Problem solving exercises
Critical thinking	Working with information, Developing critical thinking
Brainstorming	Problem thinking
Integrated learning/teaching, transfer and interdisciplinary linking (CLIL)	Complex understanding Group work Working in and for multidisciplinary teams
Project method	Create project frameworks (work plan, Suitable materials and schedule/time management/task distribution, project work, project evaluation) Establishing fictitious companies Planning and project management in order to achieve goals Collaboration, cooperate within the team Making own ideas relevant to the team Team leadership

Despite this general awareness, as noted in the section above, the reality of the situation in the Czech Republic is, in short,

- Entrepreneurial competences are not taught in schools as specific subject, but embedded in a number of compulsory subjects (civic and social sciences) as expected learning outcomes
- Financial literacy as knowledge is included in the schools curricula in primary and secondary as part of social sciences.

- Companies start up and business management are taught in high business schools and through projects and programs funded with ESF and in collaboration with private organizations and ONGs.

In this scenario, there lacks the “entrepreneurship teacher” as professional figure in the education system and, therefore, there is not a consensual definition of the profile nor a national plan for entrepreneurship teachers education.

Teachers of civic and social subjects are generally responsible for financial literacy and entrepreneurship competences, as well as to participate in the collaboration activities between the school and the Centre for Practice Enterprises or Junior Achievement.

Notwithstanding, inasmuch as more schools offer/participate in entrepreneurship teaching activities, in the last years a number of courses and seminars have been developed, along with manual and other didactical tools (in most cases supported by the ESF).

Further Education of Pedagogical Workers

Within the system of Further Education of Pedagogical Workers courses limited to financial literacy are available for all teachers, not for entrepreneurial skills as such.

Higher education institutes are autonomous and can choose whether to include entrepreneurship education in ITE study programmes.

In August 2014, the Further Education Fund (FDV), an organisation of the Ministry of Labour and Social Affairs, launched the project 'Internships in Companies – Education Practice 2' (*“Stáže ve firmách – vzdělávání praxí”*). One of the results of this project, which ended in September 2015, is the National Catalogue of Internships, an online freely accessible platform, which aims to offer internship opportunities for potential candidates.

Entrepreneurship also might be taught as part of the requalification process conducted by the Employment Office by relevant jobseekers.

Entrepreneurship courses are mostly provided by private entities as paid courses or workshops.

The General School Methodological portal (RVP.cz)

The aim of the Methodology II project was to increase teaching quality by providing teachers with systematic support in the area of teaching methodology, development of learning communities, and effective self-improvement support through ongoing training of teachers. As a vehicle for these activities, the RVP.cz Internet portal was created.

Since its establishment, the portal has earned a good reputation within the teaching community and has been successful in meeting its goals even after the completion of the Methodology II project in 2012.

Until 2009, there was no respected website in the Czech Republic – despite several attempts to set one up – where teachers would “gather” and share their experiences, know-how, and motivation. The emergence of the RVP.cz portal succeeded in meeting this requirement, particularly thanks to its practical content, which is a real benefit for teachers and is created by the teachers themselves. Another important element that has helped to spread information about the portal is the licences that have been selected for individual published materials – these include Creative Commons licences. These licences stipulate that the work can be freely distributed and modified, and used as a basis to create derivative work. Teachers have thus been given access to materials that can be legally and safely used for their work, without them having to become experts on various licenses.

The RVP.cz methodological portal offers, through its content section, the possibility to freely use all materials, the so-called DUM (digital teaching materials, i.e. basic teaching aids), which support the introduction of school educational programmes (ŠVP) in all types of schools. The materials include theoretical contributions, teaching ideas, learning materials, etc.

In the community sections (Wiki, Forums, Digifolio, Blogs), the portal offers teachers a communication space where they can share their experiences, exchange ideas, and participate in the development and improvement of the contents of the Methodological Portal.

Digifolio is a module whose functions are intended for the users themselves. Users can create their own digital portfolios, which affords them the opportunity to track their own professional development and to plan their future goals. Digifolio is used for teacher self-evaluation and to facilitate their professional development.

The educational part of the Methodological Portal (e-learning module) is populated by tutored e-learning courses, which follow the published materials, thus contributing to further education of participating teachers. This section is now starting to focus on webinars.

In 2016 there were 285 support materials for entrepreneurship education or education about entrepreneurship.

The screenshot shows the website 'Metodický portál' with a search bar and navigation menu. The article 'Podpora podnikavosti - Inspiromat' is highlighted. The article details include:

- Author:** kolektiv autorů
- Spoluautor:** Ing. Petr Klínský, Ing. PhDr. Marie Fišerová, Markéta Javorská, RNDr. Alena Olšáková, Ing. Kateřina Macková, Martina Colledani, Ing. Lukáš Hula, Jana Merunková
- Anotace:** Cílem publikace je seznámit cílovou skupinu pedagogů s možnostmi, jakým způsobem lze rozvíjet podnikavost žáků, jaké nástroje mohou využít k rozvoji kompetencí k podnikatelským aktivitám a uplatnění na trhu práce. Učitelé se v publikaci seznámí, jakým způsobem je možné založit fiktivní firmu nebo jak je možné se zapojit do programu JA firma. V metodické publikaci je možné se seznámit také s dalšími metodami podpory podnikavosti žáků.
- Klíčová slova:** fiktivní firma, kompetence k podnikavosti, podnikavost, studentské firmy
- INFO:** Publikován: 29. 09. 2014, Zobrazeno: 3588krát
- HODNOCENÍ PŘÍSPĚVKU:**
 - Hodnocení týmu RVP: ☆☆☆☆☆
 - Hodnocení uživatelů: ☆☆☆☆☆
 - 1 uživatel: ☆☆☆☆☆
 - zatím nikdo: ☆☆☆☆☆
 - zatím nikdo: ☆☆☆☆☆
 - zatím nikdo: ☆☆☆☆☆
 - zatím nikdo: ☆☆☆☆☆

The Centre for Practice Enterprises (Centrum fiktivních firem)

This is an activity of the National Institute of Education and a member of the international network EUROPEN – Pen International gathering practice enterprises from all over the world.

It offers students in upper secondary vocational education the opportunity to manage a 'practice enterprise' in order to develop their entrepreneurial skills. These companies are set up by students under the supervision of the teacher and in co-operation with the Centre.

The Centre coordinates activities carried out by a network of practice enterprises active in the Czech Republic, provides support and consultation services to pupils and teachers involved in practice enterprises.

CENTRUM FIKTIVNÍCH FIREM



Vítáme vás na stránkách Centra fiktivních firem (CEFIF). Naleznete zde informace o tom, co je to fiktivní firma, jak ji založit, jak ji vést, jak spolupracovat s ostatními fiktivními firmami a spoustu dalších užitečných informací.

Úkolem CEFIF je koordinovat činnost sítě fiktivních firem v České republice, poskytovat podporu a poradenství žákům a učitelům působícím ve fiktivních firmách.

Na [CEFIF Portalu](#) je k dispozici ke stažení CD CEFIF.

[Přihláška školy do sítě CEFIF.doc](#)

[Facebookové stránky CEFIF](#).

CEFIF je členem mezinárodní sítě [EUROPEN - PEN International](#), která sdružuje fiktivní firmy z celého světa. Na těchto webových stránkách je též k dispozici databáze všech fiktivních firem, adresář zahraničních center fiktivních firem, přehled mezinárodních veletrhů a spousta dalších informací. Některé jejich části jsou chráněny přístupovým kódem. Tento kód Vám rádi na požádání sdělíme.

O fiktivní firmě

Úřady CEFIF

Veletrhy fiktivních firem

Informační e-maily

Výsledky veletrhů fiktivních firem

Soutěže CEFIF

Semináře pro učitele fiktivních firem

Často kladené dotazy

Cooperation school-companies

Schools and employers cooperate at institutional level, the quality and the form of the cooperation depends on the attitudes of those, who are responsible for the cooperation. Generally, cooperation school-companies is oriented more to employability than entrepreneurship.

There exist different instruments strengthening the mutual institutional cooperation, on the regional level exist following measures: employment pacts, incentives for pupils, centres serving as a meeting points for both schools and enterprises. The state supports systematic the cooperation by setting new legislation aimed at the possibility to apply tax reductions for employers.

The cooperation between secondary schools and employers was supported by the national project Pospolu (Together, 2012-2015). The main goal of the project was to suggest legislative and system changes that could enhance effective and easier cooperation.

Based on the discussions with the social partners was developed a conceptual study with recommendations, that was pilot tested by a network of 38 schools and 115 employers, enterprises and further subjects in practice.

The Project Pospolu prepared also a set of useful instruments that enable easier planning, implementation and evaluation of cooperation between particular secondary schools and employers such as following:

- ✓ We march together towards effective cooperation between schools and enterprises publication for schools (publication).
- ✓ A guide for enterprises: how to start a cooperation with schools - a material for employers.
- ✓ Online planning of cooperation (an online application).
- ✓ A course for instructors of practical training.
- ✓ List of email addresses of umbrella employer institutions.
- ✓ PRACTICAL FINAL EXAMINATION IN AN ENTERPRISE (methodological material).
- ✓ Ecvet units of learning outcomes for particular internships of pupils or teachers in enterprises (template for ECVET units of learning outcomes).
- ✓ Questionnaire on quality for enterprises.
- ✓ Methodical publications.

Teachers Training in Junior Achievement Cz

JA Cz offers (by payment) entrepreneurship teacher training accredited by the Ministry of Education, Youth and Sports. In 2020 are planned three types of accredited DVPP training to support program development:

Entrepreneurship education at primary school, aimed at familiarizing with the courses JA My First Money, JA Business Alphabet and JA Professional Orientation.

Education for entrepreneurship at secondary school, focused on familiarization with the teaching program JA Student Company and its implementation in school education.

Education for entrepreneurship at secondary school - Advanced. This seminar includes 5 thematic blocks focusing on professional topics in the field of entrepreneurship. Its aim is to provide teachers with practical knowledge gained in companies across disciplines and sizes of companies and thus help them in the management of student companies.

1.5. Main Findings

- i. **There is a general awareness about the importance of Entrepreneurship Education for the sustainable development of the Czech Republic, as well as about the key role of Entrepreneurship Teachers to reach the objectives.**
- ii. **Competences and skills related with entrepreneurship, desirable teachers profile and appropriate teaching methods and tools, as defined by the European Commission, are fully embedded in the strategic framework and in the political and academic discourses.**
- iii. **Despite this, the Czech Education System has not yet implemented these concepts at the operational level within schools and both in primary and secondary education**
 - **Entrepreneurship competences are taught as part of civic and social sciences subjects, with a strong approach on employability.**
 - **Most entrepreneurship education is offer in collaboration with private organizations and NGOs, like Junior Achievement.**
 - **Financial literacy and business management are still the dominant approaches in the educational practice.**
- iv. **Consequently,**
 - **The entrepreneurial teacher is not included as professional figure within the education system.**
 - **Entrepreneurial education for teachers is not included neither in initial training, nor in professional development.**
 - **Best practices in entrepreneurship teachers training are based on peers-peers learning through on line platform and private provision that is not free for teachers.**

2. ENTREPRENEURSHIP TEACHERS IN THE DIGITAL ECONOMY: A FIELD SURVEY.

2.1. Introduction – about scope and sample

The 6 interviews took place from 28. 1. to 11. 2. 2020. Three interviews were done with VET teachers from the secondary vocational school Centre of Vocational Technical-Economic Training. Their specialization was in fields of economics, IT and specialized professional subjects. Three interviews were done with business representatives of different SMEs or self-employed entrepreneurs. The first company is a family business for the production of stoves and fireplaces which uses e-commerce systems. The second company focuses on global markets e-shops and CRM systems. The third company is an international educational company in VET. There was 4 men and 2 women interviewed. The age of respondents varied from the youngest 25 to the oldest 65 years old.

2.2. Summary on suggested profile (key characteristics / skills and competences) of an efficient teacher-entrepreneur

The idea of a “regular” teacher was quite clear to all respondents. Easily, they then added many characteristics to “upgrade” such a teacher to an efficient teacher-entrepreneur who facilitates the knowledge. Based on all responses, such a teacher could be characterized in the following ways:

- 1) *“Teacher who is young in spirit, is interested in what is going on around him and tries to keep up with constantly evolving modern technologies.”*
- 2) *“Teacher who has critical thinking, who has an ability to distinguish what can be helpful for the students and what, on the other hand, they may never use in practice.”*
- 3) *“A person who gives students enough space and means to solve problems on their own, to make mistakes and learn from instead of telling them what to do.”*

It is important to say, that respondents felt that teacher’s working environment has a big influence on him/her. Therefore, an efficient teacher-entrepreneur can bloom only in supportive environment of his school and colleagues.

Among the skills, competencies and attitudes were mentioned:

Skills	Competencies	Attitudes
Technical skills	Able to explain to students practical use in personal and professional life	Pro-active and innovative
IT skills	Able to attract students attention	Desire to further educate him/herself
Economics	Logical & critical thinking	Desire to use own knowledge in the classroom
Possibly skills from own entrepreneurial activities or from family/relatives/friends business	Able to think interdisciplinary (not only in one's own subject)	Does not stop developing himself/herself
Communication skills	Able to let students solve problems instead of telling them immediately how to do something	Individual approach to kids and their needs
	Creativity	Student-friendly

2.3. Results from semi-guided questionnaire – (about) learning needs/ gaps

LEARNING NEEDS/ GAPS

According to the VET teachers, the crucial problem is that teachers usually do not have any awareness or knowledge about existence of such useful programmes or software tools. Or if they do, they do not know how to use them meaningfully. Another important aspect which is not well known among VET teachers is data protection and the risks which they can have on student's possible future business if he or she neglects them. Similarly, the knowledge of rules of GDPR is what lacks among fellow teachers and educators.

Among the e-tools, software and technology mentioned by the VET teachers were a range from the most basic tools like MS Office and cloud-based tools for sharing document or calendars to more professional programmes. For example, an accounting software called "Pohoda" was mentioned several times as it is one of the most common tools for bookkeeping in the Czech Republic. The teachers mentioned a need to know how process graphic content, cut videos or edit photographs (e.g. Adobe Photoshop) as a part of marketing strategies. For professional use in entrepreneurship for their students, they consider AutoCad the most important tool.

As for the companies representants, they mentioned as the most important tools like Office 365 (especially Excel), Google analytics, Google merchant and company information systems which register inputs and outputs about what happen in the company. Of course, social media like Facebook, Instagram, Tik Tok and Twitter are crucial for marketing. Also, using phone as a working station was mentioned, for instance applications like Fakturoid which represents simplified digital account system and saves money for the accountant.

Problematic topics for VET teachers and training might be in their opinion insufficient knowledge about author's right and security (e.g. using anti-virus systems). Another problem is knowing how to be effective. This is considered to be not focused on in schools at all, although it is a crucial ability in digital world. Finally, teachers lack knowledge from practice because they do not have connections to real business.

DIGITAL – DIDACTICS

The VET teachers agreed that it is important to teach students how to work in MS Office tools and, as they are a technical-economic training school, they need to be taught how to work in AutoCad. General knowledge of html or php language were named by the IT teacher. Moreover, they should be familiar with bookkeeping and accounting programmes, as well as programmes for marketing management, in case they want to be self-employed. However, the teachers were not able to name any such programmes. The company representatives agreed with importance of technological tools like CAD/CAM, Wolfram Alfa, Pohoda (accounting system) or other tools like grammar correctors. Also, basic knowledge of programming was mentioned to be able to understand what is going on, not to necessarily know how to programme.

The VET teachers see two main problems of “traditional teachers” and skills they lack. Firstly, it is a conservatism approach of these teachers and their unwillingness to leave the stereotype. They often do not follow the trend in the world and society around us, they do not keep up with the possibilities and technologies and thus they cannot transfer the knowledge to their pupils. Older generations of teachers are considered the most problematic in this sense, as they lack the most basic knowledge of PC usage and interactive lessons. Secondly, among “traditional teachers” prevails a dislike or unwillingness to communicate with their pupils differently than in one-way direction. The focus should be transferred on more interactive work, moderated discussions and practical examples. The interconnection of school subjects with practice is considered a key, it is crucial for teachers to be able to show to the students how new technologies can help start their own future careers, how they can affect the work they are doing and how they can help the possible business to develop.

Company representatives understand the problem in a more complex way, not only in teachers themselves but in the whole educational system when teachers have to follow curriculum prepared by the Ministry. Firstly, the focus on technologies should be emphasized there. Then, of course, it depends on the personality of a teacher. Another suggested would be to be able to include real life examples of entrepreneurs to the education, to show on real people what they do while using certain technologies (e.g. E.Musk, B.Gates or local entrepreneurs from the region of the school).

DIGITAL – ENTREPRENEURSHIP

The VET teachers mentioned several tools used in the professional business world for smoother and faster implementation of tasks. Among those are on-line reservation systems, online payments, using social media to advertise one’s services or products and for marketing and responsive websites to a mobile interface. From cloud-based tools, G-suite was named as

a practical tool for increasing one's productivity. They see the main use of digital technologies in the fields of marketing and trade/ business communication. Other entrepreneurial fields remained rather marginal in their eyes. Companies representatives add to those working with e-mail databases, CRM (Customer relationship management) tools, Google tools and social media.

As for good practice examples, the teachers reflected the fact that using modern technologies in schooling is closely linked to possibilities (budgetary and thus technical) of that certain school. From own experience, some of the teachers use interactive boards or e-tools like Kahoot!, Quizlet or Mentimeter. However, those are tools for teachers to make lessons more interesting, not programmes or software specialized for digital entrepreneurship.

One of the examples of company representatives was to use advertisement efficiently. They needed to advertise their products and paid an external company to do so. However, they did not know if the job was effective as and if it brought new clients at all. In the end, it was discovered that the advertisement was poorly managed and it did not target the wanted group of people. It is thus crucial to know the basics of effective marketing and be able to see if your advertising is doing right, otherwise, you can lose a lot of money on it. Students should be taught to know how to tell what kind of advertisement they want, if they need PPC (price per click), if the investment will pay back or if to use other tools.

Another example from practice is to always secure your data and have a backup system. In one of the companies, they use a memory server to which one can connect from a computer even while being home. This interconnectivity is considered extremely important. However, the backup system did not work properly and no one in the company knew. Only by accident, they discovered that their data and documents were not backed up. Therefore, one cannot blindly rely on an IT consultant or external help, students should be able to realize when something is wrong so that they can solve it or ask for help before a disaster occurs.

As teachers feel it, at VET schools, where students are prepared for a specialized profession in which they may do business, economics and entrepreneurial education is taught only on a theoretical level. Practical education is usually missing, therefore using modern technologies and tools in practices is lacking as well. Students have almost none knowledge of possibilities of digital education and they can hardly imagine what the term "digital entrepreneurship" means. Again, that example applies to the majority of Czech school but not all. The involvement of schools into implementing modern technologies and supporting entrepreneurial education mostly depend on the interest of the school's management. The same is seen by companies' representatives. Students are not connected to the real world, they lack practice. They are not taught how to be more competitive, how to create additional value to their product. They should know the competition on the market, for instance, Czechia has a record number of e-shops per person and the student should know how to diversify from

the others. However, all of the companies' representatives also admit that they have not seen a VET school teaching in a long time and it is hard for them to evaluate it.

EXISTING EDUCATION PROFILE OF ENTREPRENEURSHIP TEACHERS

Education of teachers on a high-school level in subjects of entrepreneurship, digital entrepreneurship or digital technologies is in general supported and desired state. The Ministry of Education, Youth and Sport of the Czech Republic has prepared frameworks on competencies and skills which teachers should acquire. For instance, the Teacher's Digital Competencies Framework⁷ aims to motivate teachers and schools to systematically develop their digital competences. The entrepreneurial education is anchored in the Educational Programme for Secondary Education Framework as one of the key competencies which a student should acquire. Nevertheless, there is no common state initiative in the education of teachers and trainers in these areas.

Possible ways for teachers to educate themselves in such subjects is through (1) irregular grant programmes, usually on regional level, (2) life-long learning university programmes, (3) guidelines, (4) private paid seminars and courses.

Firstly, on the regional level or on the level of municipalities, schools and teachers may enter seminars or projects which are from time to time focused on support of entrepreneurial education of teachers. Realization of seminars about digital competences of teachers is, nevertheless, optional. These are usually co-financed by European Union, Erasmus+ or Ministry of Education, Youth and Sport of the Czech Republic. Secondly, in 2017, the pedagogical faculty of Masaryk University prepared a life-long learning programme called "EDUpreneurship"⁸. The study programme aimed to develop practical entrepreneurship of pedagogical staff, who can then effectively develop entrepreneurship with their pupils/ students. The programme was focused on teaching principles of social entrepreneurship, management of social change in organizations, functioning of business accelerators, project management and team management, methods of effective skills development and innovation in a virtual environment. However, the programme is no longer realized. Similarly, in 2012 - 2014, the National Institute for Education realized a project CENTRES – Creative Entrepreneurship in School focused on European multi-sectoral forum on support entrepreneurial competence and innovation. The project is also no longer realized. Thirdly, in 2013, a *Guide for educators in Entrepreneurship education*⁹ was released in the Czech language. The guide was prepared by

⁷Rámec digitálních kompetencí učitele. MŠMT. 2018. <http://www.msmt.cz/vzdelavani/dalsi-vzdelavani/ramec-digitalnich-kompetenci-ucitele?lang=1>

⁸EDUpreneurship. Masaryk University. 2017. <https://podnikavostvevzdelavani.wordpress.com/co-je-to-edupreneurship/>

⁹Podnikatelské vzdělávání: Příručka pro pedagogy. Evropská komise, Brusel. 2013. <https://euhrou.cz/materialy/podnikatelske-vzdelavani-prirucka-pro-pedagogy/>

the European Union's General Directorate for Enterprise and Industry. The document contains information how can teachers contribute to teaching entrepreneurship and presents practical examples of initial and continuous professional education from schools and universities in Europe which have already implemented some subjects or programme to support entrepreneurial education. None of these examples, however, comes from the Czech Republic. The guidebook is free to download. Finally, schools or teachers may enrol in private seminars or internships in the area of entrepreneurship or education. These courses must be paid; however, schools may usually include the entrance fee in their budget costs. One of the biggest private providers of such courses around the Czech Republic is yourchance o.p.s. with its specialized professional programme called Podnikavost.cz.

THE BUSINESS SITUATION/PERSPECTIVE

One of the biggest surveys ever done on the topic of digital entrepreneurship among SME entrepreneurs, craftsmen and tradesmen was done by AMSP CR in cooperation with IPSOS research Agency in January 2019. The research called "Digital craft¹⁰" were done as a part of AMSP CR's initiative called "The Year of Digital Entrepreneurship 2019". It focuses on the usage of digital technologies of the target groups and their needs. In total 100 people were interviewed. It has been discovered that 7 out of 10 entrepreneurial subjects use modern technologies while working, the most common ones were the Internet of Things, online marketing and Cloud.

However, there is a gap in using digital technologies among SMEs and among self-employed craftsmen and tradesmen. Almost 50% of the latter do not use any new technologies or digital applications which can lead to a loss of their competitiveness in the close future. Either of the groups is not investing much into cyber security. Similarly, almost 30% of respondents do not invest in education of their employees in digital skills. The majority of respondents look for new information in digital technologies on the Internet, at seminars, in printed publications or at social media sites. Nevertheless, 50% of the respondents cannot imagine anything under the term "digital craft". That indicates that there is an insufficient vocational education focused on digital entrepreneurship and therefore, SMEs and craftsmen struggle with the transfer to the 4.0 digital environments. Moreover, only 32% of respondents believe that vocational schools prepare new students in digitalization well enough for further practice.

According to the National Institute for Education¹¹, the digital skills which will be needed the most in the not too distant future. There will be a higher focus on project-oriented work which will increase the demand of workers who can interlink the use of media, virtual forms of

¹⁰AMSP ČR. Digitální řemeslo. Závěrečná zpráva. Ipsos Marketing. 2019. [online] Retrieved from: <http://amsp.cz/wp-content/uploads/2019/02/TZ-2019-02-13-%C5%98emeslo-4.0-pr%C5%AFzkum.pdf>

¹¹DIGITALIZACE SVĚTA PRÁCE: KOMPETENCE PRO PRŮMYSL 4.0. Národní ústav pro vzdělávání. <http://www.nuv.cz/vystupy/kompetence-pro-prumysl-4-0>

cooperation and software for project management. As work content head towards increasing diversification, there will be higher demand of professional VET competencies in digital environment, for instance: computer-aided design, customer relationship management, enterprise resource planning, big data analysis, electronic warehouse management systems, digital payment systems, integrated software and network solutions, data collection about technical equipment on farms and their monitoring, etc.

NEEDS/GAPS TO BE FILLED IN INITIAL AND CONTINUOUS PROFESSIONAL EDUCATION

Initial professional education	Continuous professional education
<ul style="list-style-type: none"> • emphasize digital skills and entrepreneurial skills in official state educational curriculum. • emphasize re/education of VET teachers. • number of possibilities for teachers to be educate themselves 	<ul style="list-style-type: none"> • specific fields in digital and entrepreneurial areas. • visits to real enterprises or companies. • possibilities to connect teaching with practice.

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