

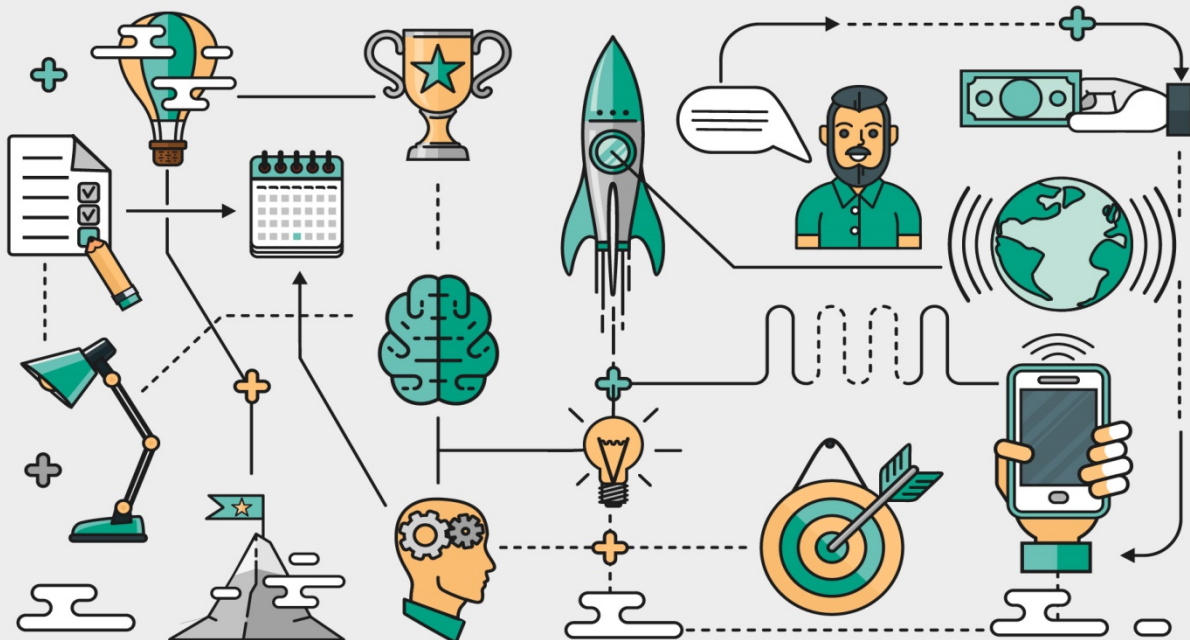


Erasmus+



# InnovatiVET

## INTELLECTUAL OUTPUT 2 - TOOLKIT WORK-BASED LEARNING PRACTICES IN EUROPE



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## FOREWORD

### Work-based learning in Vocational Education and Training

InnovatiVET, the project that is the subject of this report, is approved in the Erasmus plus K2 strategic partnerships program by the Danish National Agency.

This document explores Work-based learning across Europe. This report is Intellectual Output 2 (IO2) and develops a toolkit for teachers and educators to create a Work-based Learning scenario and a didactical tool. Work-based learning is seen as a didactical tool for teachers to co-create education with companies and provide learning and training in co-creation for teachers as well as students.

This report has only been reviewed by the authors. The authors are representing different organizations across Europe in the project team and are consisting of:

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## CHAPTER 1:

# WORK-BASED LEARNING IN EDUCATION ACROSS EUROPE

The European Union has gathered 20 guiding principles for high-performance apprenticeships and work-based learning models in Europe. These principles are further divided to four policy challenges within the framework of work-based learning:

- national governance and social partners' involvement;
- support for companies, in particular SMEs, offering apprenticeships;
- attractiveness of apprenticeships and improved career guidance; and
- quality assurance in work-based learning.

In this report we will review cases from Slovenia, Finland, Denmark, the United Kingdom and Italy based on the aforementioned model, in order to **identify good practices** and to **propose a pedagogical model** for quality in work-based learning in Vocational Education and Training (VET). To conclude each chapter, we will analyze the cases in comparison to the European guiding principles.

The cases range from established models for Work-based Learning to more experimental cases where work-integrated learning has been introduced at school level. The descriptions illustrate the wide spectrum of Work-based learning approaches, starting from a system level, and expanding to the organization and learner level, as shown in figure 1.

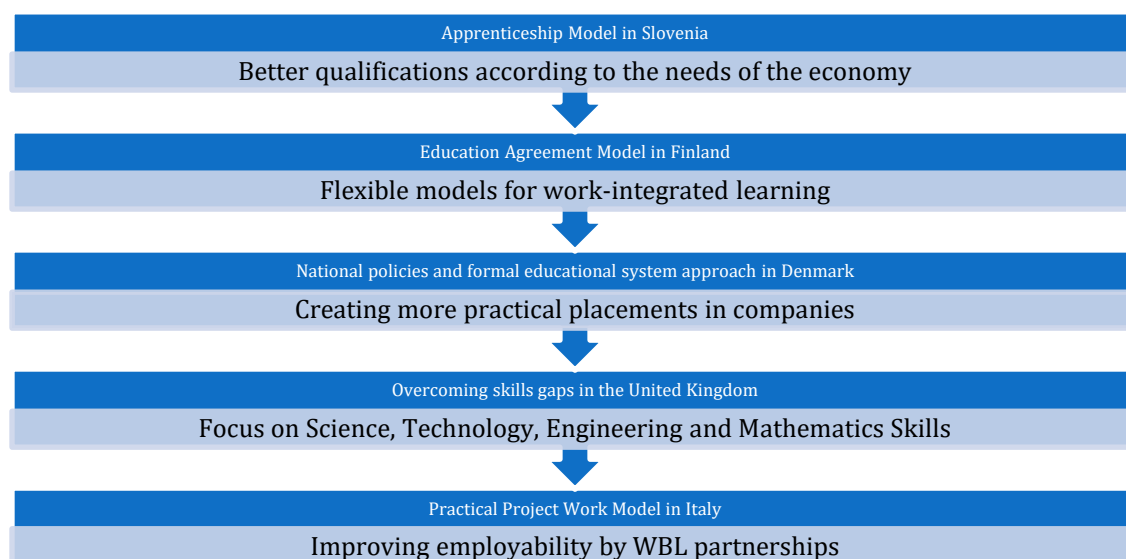


Figure 1: Outlook of the cases presented in the report

## Introduction of Apprenticeship system in Slovenia

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In the school year 2017/2018, based on the Apprenticeship Act, Slovenia implemented an apprenticeship system that includes the principle of work-based learning. Experience shows that apprenticeships are an effective way for younger generations to gain knowledge and experience. For employers the apprenticeship model improves the co-ordination between workplaces and education, while helping to meet the needs of the work organizations.

The apprenticeship system differs from school based education in that the **majority of education is carried out with the employer**. In the Slovenian case, 50% of learning needs to be carried out as practical work-based training with employers (approximately 56 weeks spread over three years), while this share in school-based vocational education and training is lower, on average 22% or 24 weeks of practical working with employers.

In the school year of 2018/2019 it will be possible to study in the following apprenticeship educational programs:

- Carpenter
- Stonecutter
- Metal designer - toolmaker
- Gastronomic and hotel services
- Glass-worker
- Paper-maker
- Painter
- Machine mechanic

The introduction of apprenticeships in this way is part of a larger policy of the **Modernisation of Vocational Education 2016–2021** in Slovenia. The goal is to improve the practical skills of participants joining the labour market, to eliminate the gaps between the vocational competences acquired and the needs of employers, and also to provide for faster transition of participants in education into employment. (Eyrudice 2019.) The benefits for the different stakeholders are outlined below.

### Benefits for employers

Through apprenticeship, young people truly gain the competencies that employers need. The apprenticeship brings the possibility for employers to choose their future colleagues with whom they sign an apprenticeship contract.

The apprentice has the status of a student, which means that the apprentice is not employed by the company. The employer has the opportunity to get to know apprentice well, which makes their decision on further employment easier. Employer actively participates in the training and education of an apprentice, thus ensuring adequately trained future employer.

### Benefits for apprentices

Training takes place directly in the company. Aside from learning in a school, 50% or more of the educational program takes place in the company, where student becomes acquainted with the company and engage with the work and environment. Student see and try the real work, receive financial award for the work and has a mentor who takes care of him and directs him professionally.

Student acquires the knowledge and competencies that employers need. He will start to form his career very early. In addition to support from the company, school also adjusts the way of education and theoretical education.

### Benefits for the vocational education and training schools

Schools have, according to the WBL objectives, clear and objective information about companies that meet prescribed material and HR conditions for WBL. The mentor responsible for the organization and implementation of WBL in the company is qualified and aware of the WBL objectives for a particular program. Teachers has opportunity to connect and cooperate with the company mentor and thus maintain industry currency. Teacher can work with students coming from WBL in a company on concrete, practical and more demanding cases.

### Innovative nature of the case

From the viewpoint of innovative practices in the education system, implementation of the Slovenian apprenticeship system is expected to deliver:

- better qualifications according to the needs of the economy
- easier transition from education to work: early professional socialization

- early employment of young people and
- more coordinated supply and demand for human resources.

Furthermore, the Slovenian state recognized the possibility of faster integration of young people into the work process in this form of education and therefore provided financial incentives for employers involved in the apprenticeship system. Employers who have decided to participate in apprenticeship training are eligible for co-financing:

- up to 2.000 EUR per year (for practical training in accordance with an apprenticeship plan) and
- reimbursement of the transport costs of an apprentice and nutrition during practical training.

**The Slovenian case highlights the following guiding principles for work-based learning:**

Principle 1: A clear and consistent legal framework enabling apprenticeship partners to act effectively and guaranteeing mutual rights and responsibilities

Principle 2: A structured, continuous dialogue between all apprenticeship partners including a transparent method of coordination and decision-making

Principle 3: Strengthening the role of social partners by capacity building, assuming ownership and taking on responsibility for implementation

Principle 4: Systematic cooperation between VET school or training centres and companies

Principle 5: Sharing costs and benefits to the mutual advantage of companies, VET providers and learners

Principle 13: Career guidance to empower young people to make well-founded choices



## References:

Vajeništvo – od možnosti do izbire (Apprenticeship - from option to choice), Center RS za poklicno izobraževanje

Vajeništvo (Apprenticeship), Projekt SEM

Informacija o poskusnem izvajanju nekaterih programov v vajeniški obliki izobraževanja (Information on probation of some apprenticeship programs), Ministrstvo za izobraževanje, znanost in šport

Razpis za vpis v srednje šole in dijaške domove za šolsko leto 2018/2019 (Call for enrollment in secondary schools and boarding schools for the school year 2018/2019), Ministrstvo za izobraževanje, znanost in šport

## Webpages:

[WIO2 WBL experiment](#)

<http://www.cpi.si/>

[http://www.mizs.gov.si/si/delovna\\_podrocja/direktorat\\_za\\_srednje\\_in\\_visje\\_solstvo\\_ter\\_izobrazevanje\\_odra\\_slih/](http://www.mizs.gov.si/si/delovna_podrocja/direktorat_za_srednje_in_visje_solstvo_ter_izobrazevanje_odra_slih/)

<http://tukajsem.splet.arnes.si/sem-delodajalec/>

## The New Training Agreement Model in Finland



In Finland, a new legislation was introduced in the beginning of 2018 on vocational education and training (VET). Based on the analysis that working life is undergoing changes and new occupations emerge and old ones disappear, the needs of the work organizations and students alike are in continuous change. Skills need to be updated throughout career as technology and revenue models change. Digitization of the entire society is seen one of the key drivers of this change.

As a part of a larger reform of Vocational Education and Training, training paths for youth and adults were integrated under same legislation, in comparison to the old one, where they formed two separate tracks. Another key element of the reform was to further strengthen the connection between education and work. As an educational and employment policy, the Finnish development is very much in line with what was described earlier in the Slovenian case. As a new element to the educational system, a Training Agreement Model was introduced in Finland in 2018.

The Training Agreement Model was created alongside the established apprenticeship training policies and can be seen as a more flexible form of training within the workplace. No work contract is needed between the student and the employer. It is suitable for situations where a student has only basic knowledge of the profession and needs extensive guidance and counselling. Apprenticeships, on the other hand, fit situations where student is already in a work contract to the employer, or in a recruiting process, where a worker is in need for updating competences. In the new policy, education agreements can lead to apprenticeships, or the models can also be combined. The following table illustrates the differences between the education agreement and the apprenticeship:

<b>Training Agreement Model</b>	<b>Apprenticeship Model</b>
Agreement between <b>school</b> and employer	Contract between <b>student</b> and employer
<b>No salary</b> is paid, other financial remuneration is possible	<b>Salary</b> is paid, regulated by national agreements
<b>Based on a status of student</b> , essentially a training contract	<b>Based on a status of employee</b> , both work and training contract
Time allocation flexible	At least 25 hours/week
The agreement can be made to study <b>parts of a qualification</b> or the <b>whole qualification</b> .	The apprenticeship can be made to study <b>parts of a qualification</b> or the <b>whole qualification</b> .

Table 1: differences and similarities between the apprenticeship and education agreement models in Finland

In conclusion, the new Training Agreement Model adds an element of flexibility to the previous Apprenticeship Model, as the contractual process involves less restrictions or regulations governed by branch-specific negotiations or national legislation. What remains same in the two models, is that a workplace mentor will be appointed for the student. In terms of Work-based learning, this is of course a crucial element in assuring quality learning at the workplace.

All in all, the new model is designed to have a low threshold to the stakeholders, and especially for the employers. As an added element of flexibility, employers can also choose the student or students they will be enrolling at the workplace. In the Training Agreement, the education institution is in charge of progression of studies and guidance services. Compared to the Apprenticeship Model, employers do not receive a remuneration of students learning with the Training Agreement.

### Benefits for students:

- students get to learn new skills in authentic work environments and job assignments
- training time can be agreed based on individual needs
- the contract doesn't conflict students right for financial support or other social benefits

### Benefits for employers

- contract is made between employers and education institutions
- training is designed in collaboration between employers and schools
- the model does not generate staff costs for employers
- financial support can be given without generating a work contract

## Benefits for schools

- flexibility of the model may help in finding new locations for work-integrated learning for students, especially in smaller municipalities or communities
- part of the education can happen with another employer or at school
- education can be developed to better meet needs of specific employers

## Innovative nature of the case

From the viewpoint of employers, the Model allows for flexibility in the collaborations between schools and companies. For the educational system, the new model means added responsibility to ensure training meets the needs of job labour market. Compared to the Apprenticeship Model, needs of specific employers can be met more easily with the Training Agreement.

From a perspective of social innovation, it is noteworthy that the Model was created in collaboration with the different stakeholders of the labour market and was endorsed e.g. by the Federation of Finnish Enterprises. The case also in a way illustrates a joint effort between different parties to negotiate the changes in the working life and arrange the required learning opportunities.

Part of the Reform mentioned was a new concept in financing the VET institutions. In order to further align the vocational education and training with the labour market, the finance of the colleges will now be based on the results. First half of the finance is counted by the number of students enrolled. The second half is based on indicators on number of qualifications or parts of qualifications finalized, as well as indicators on student employability and progression to further studies.

**The Finnish case highlights the following guiding principles in work-based learning:**

**Principle 6: Supporting measures that make apprenticeships more attractive and accessible to SMEs**

**Principle 7: Finding the right balance between the specific skill need of training companies and the general need to improve the employability of apprentices**

**Principle 8: Focusing on companies having no experience with apprentices**

**Principle 9: Supporting companies providing apprenticeships for disadvantaged learners**

**Principle 10: Motivating and supporting companies to assign qualified trainers and tutors**

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Opetushallitus. (2018): Ammatillisen koulutuksen reformi – Tietopaketti ohjaajille. Helsinki.

Presentation by Riikka Vacker in the event "Henkilökohtaistaminen" in Tampere 14.11.2017, available at [https://www.oph.fi/download/187937\\_Oppisopimus\\_ja\\_koulutussopimus.pdf](https://www.oph.fi/download/187937_Oppisopimus_ja_koulutussopimus.pdf)

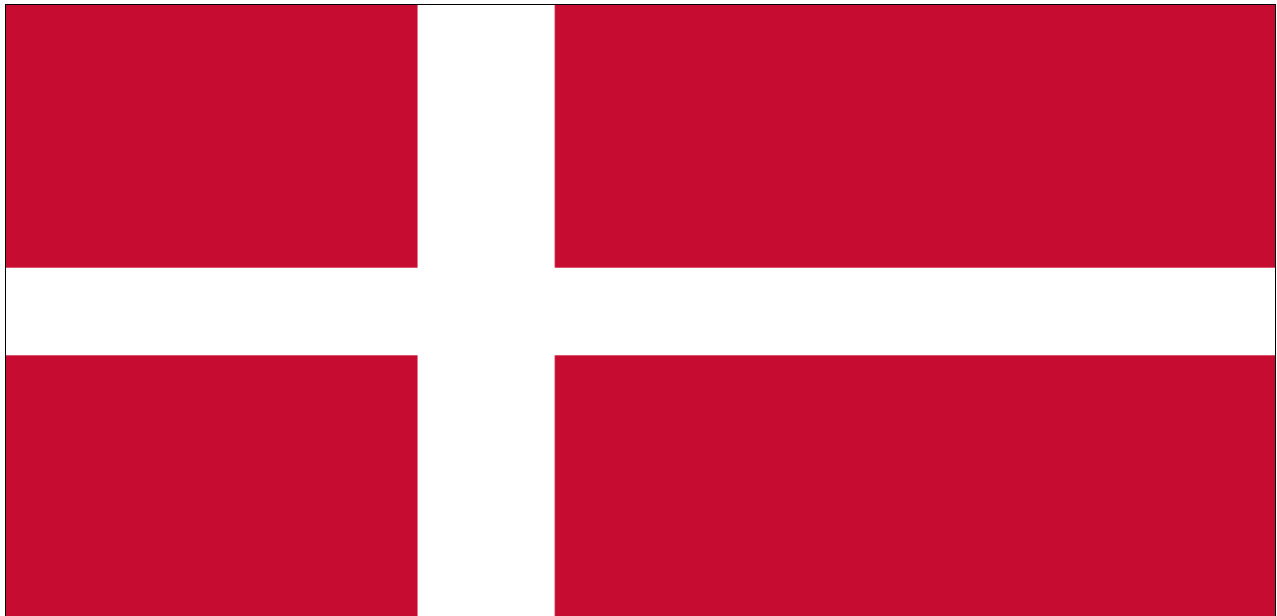
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[https://ohjaan.fi/wp-content/uploads/2018/07/tyopaikalla\\_jarjestettava\\_koulutus.pdf](https://ohjaan.fi/wp-content/uploads/2018/07/tyopaikalla_jarjestettava_koulutus.pdf)

## National policies and formal educational system approach in Denmark



In Denmark, an apprenticeship curriculum leads to a formally recognized qualification and it is included in the national qualifications framework. It provides a full set of knowledge, skills and competences to give access to a specific occupation that is recognized by employers.

The Danish VET system is part of the overall youth education system and aims to develop the general, personal and vocational skills of young people. The system is based on three main principles:

- The dual training principle, i.e. periods in school alternating with periods of training in an enterprise. This principle ensures that an apprentice acquires theoretical, practical, general and personal skills which are in demand in the labour market;
- The principle of stakeholder involvement, whereby the stakeholders take part directly in the overall decision making and daily running of the VET system by means of partnerships;
- The principle of lifelong learning, which means the system is highly flexible, and offers learners the ability to take a qualification now and return to the VET system at a later point in time to add to their VET qualifications, in order to access further and higher education.

At the end of 2013 a reform of the Danish VET system – in line with a reform of primary education (Folkeskolen) which was passed in the same year – is designed to simplify while still qualifying the apprenticeship based education and training. The purpose of the proposal is to enhance the attractiveness of VET in general and to reduce the high drop-out rates in VET.

The reform intends to develop the VET system with special regards to the practical part of the dual system. A key element in the VET reform is the effort to create more practical placements in companies, and in this way strengthen the dual VET system.

Furthermore, VET and continuing VET (CVET) are integrated in order to ensure coherence between different qualifications and competence levels.

The Danish system of apprenticeship-type schemes / work-based programmes consists of 5 key elements, which all lead to a formally recognised qualification that gives access to a specific group of occupation recognised by the employers. The first three give access to fully qualified skilled jobs, while the fourth and fifth give access to partially qualified skilled jobs. For all five elements, the apprentice has a training agreement which is a legally binding contract with an enterprise:

- Vocational Upper Secondary Education and Training (IVET)/Erhvervsuddannelse/EUD, which is the 'main road' used by the large majority of students.
- Combined Vocational and General Upper Secondary Education, EUX-Programme (New Academic Preparation Programme) – a relatively new pathway, used by highly motivated students aiming at obtaining a double qualification.
- New Apprenticeship (Ny Mesterlære), used by students with a practical approach to learning.
- Basic Vocational Education and Training (egu), used by students with a practical approach to learning.
- Individual vocational education and training, used by a very small minority of students.

In the following, we elaborate the specific details about the Danish systems' implementation, approach and pedagogy within the framework of work-based learning.

The Danish Model for VET education has a structure in two parts, a basic course and a key course.

It starts with a basic course, which is the initial part of the program, and takes place as a school-based course with a certificate for completion of the basic course. It is the basis for admission to a key/head course which constitutes the remaining part of the program.

The basic courses for vocational education and training are grouped into joint academic entries, which are called:

- Car, aircraft and other means of transport
- Construction
- Building and user service
- Animals, plants and nature
- Body and style
- Food for people
- Media Production
- Production and development
- Power, management and IT
- Health, care and pedagogy
- Transport and logistics
- Mercantile

The basic course usually lasts two years in the office area and in the retail area one to two years, while the basic course of the technical vocational training typically lasts half a year.

The Ministry of Education assigns the joint academic entries to vocational education and training schools.

The main course consists of both school and internship education and assumes that the student enters into an education agreement with a company or is admitted to school practice. The main course begins with an internship period.

Training agreements must be concluded before the beginning of the internship program. They can also be concluded before or during a basic course. The employer pays wages to the student from the date of entry into the education agreement - also during school stays.

In 2013, it was decided to establish 50 new professional centers for practical learning in connection with the vocational colleges aiming to offer practical training for students without a training agreement

### New practical training centers

In 40-50 percent of the vocational programs, school-based practical training is offered to students who are unable to obtain an internship within a reasonable time limit (2 months). This is part of the educational guarantee. However, it is imperative that the student, at first, tries himself/ herself to obtain a practical training contract. Furthermore, the student has to be prepared and ready, both in terms of education and physical condition to embark on a vocational education programme.

In September 2013, the Danish government and the Ministry of Education decided to establish 50 new practical training centers in connection with selected vocational colleges all over Denmark aiming to offer a school based practical training in company-like surroundings.

An intense focus on quality in training and development of teachers/trainers competencies shall ensure that students without an ordinary training agreement can get same level of practical training as it would be in a company.

### Benefits for students

The first to years of mandatory education at school gives the advantage to students is that they can try different crafts before settling on an exact education within the beginning of the school training. Furthermore, that they in the second half of the education, that is a formal apprenticeship with a company, gain direct training in the workplace. They are remunerated for their work, which is very fulfilling. They also have a mentor to follow in the company. In that regard, they become acquainted with the demands of the profession and the company.

However, since it is not all students that gain an apprenticeship the advantage of the new training centers is that more students can obtain an education and that the students, later within the vocational training and education can obtain an apprenticeship the systems allow for the flexibility to pursuit an apprenticeship without prolonging the total duration of the education.



## Benefits for employers

The Danish apprenticeship model provides employers with the benefit of having trained professionals within the span of the apprenticeship period. Particular since they are being trained within the specific company's needs and skills. So, if the employer wish to keep the student after graduation they can provide them with a contract. Furthermore, the investments in new training centers provides more students to select from and does also carry the benefit that shortages of professionals that are usually created through economic down cycles are scarcer.

## Benefits for schools

Schools can have more students graduate by having professional training centers. Furthermore, the apprenticeship model provides for a continuously interaction with companies thus being able to detect new developments within industries.

## Innovative element of the case

The training centers represent a new way of practice placement and vocational colleges will have a greater share of responsibility for putting together a student's total education plan if the student has not received a regular training contract with an employer for the entire education program.

In connection with the establishment of training centers, the legislation has been revised in order to give more flexibility for the students who do not have a full contract with a company. It means that the student with help from the training center can get short time contracts in different companies, so that they can have as much practical training as possible in their educational pathway. At the same time, new models for combination of ordinary internship and training in the new training centers are introduced, and efforts are made to strengthen the use of internships abroad according to the so called PIU-ordning (Practice Abroad).

**The Danish case highlights the following guiding principles in work-based learning:**

**Principle 11: Promoting the permeability between VET and other educational and career pathways**

**Principle 12: Improving the image of VET and apprenticeships by promoting excellence**

**Principle 13: Career guidance to empower young people to make well-founded choices**

**Principle 14: Enhancing the attractiveness of apprenticeships by raising the quality of VET teachers**

**Principle 15: Promoting the attractiveness of VET and apprenticeships through a broad range of awareness-raising activities**

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## Webpages:

<https://deg.dk/medlem/bestyrelsesarbejde/erhvervsrettede-uddannelser/erhvervsuddannelser-eud/26/2/2019>

<https://www.bcsyd.dk/merkantilt-hovedforloeb/for-virksomheder/virksomhedssamarbejde/26/2/2019>

## United Kingdom: Closing the STEM skills gap



### Apprenticeships in the UK

Technical training and apprenticeships are devolved policies in the UK, meaning that the governments of Wales, Northern Ireland and Scotland are responsible for setting the detailed policy in those countries. Unless otherwise mentioned, the text below refers to England.

In 2015 the government overhauled its apprenticeship policy, with the goal of creating 3 million new apprenticeships by 2020. This is intended to address skills shortages reported by employers, and to reverse the trend of low and declining investment into employee training. At the same time, apprenticeships were also given the same legal status as university degrees, to address a perceived cultural bias in favour of academic degrees and against vocational training.

In 2017, the government introduced the Apprenticeship Levy, a scheme requiring all employers in England over a certain size (those having a pay bill of over £3 million) to pay 0.5% of their total pay bill into a fund. The company may then apply to this central fund to pay for the training of apprentices. If the funds are not used within 24 months, they expire and are reclaimed by the government. In this way, the mechanism provides a strong incentive for employers to take on apprentices. Further incentives are provided in certain cases, for example, for apprentices between 16 and 18 years old, companies receive a further £1000 to help meet the extra costs of employing them. Smaller companies that do not need to pay the Apprenticeship Levy may also apply for funds, however the amount of money set aside for smaller companies has not been sufficient to meet the demand in the first year.

After the introduction of the Apprenticeship Levy the number of new apprenticeships starting fell by 24%, from 495 in 2016-17 to 376 in 2017-18, while the cost of training each apprentice was found to be around double what was expected, making it more likely that the programme will overspend in future. A review conducted by the Government stated that the target of 3 million new apprenticeships by 2020 was very unlikely to be met.

## The skills gap

The lack of sufficiently skilled applicants mentioned above is particularly acute in engineering and technical disciplines. According to the Royal Academy of Engineering [RAE, 2018 “Closing the STEM Skills Gap”], more than half of engineering companies said they have had problems recruiting the experienced engineers they need, and 90% of employers anticipate that this situation will worsen in the next 3-5 years. There is currently a need for over 70,000 skilled people in engineering and technical disciplines, and this figure will rise significantly as a large section of the current workforce reaches retirement.

To address this STEM skills gap, the UTC (University Technical College) model, a new approach to schooling for students aged 14-19, has been developed since 2010. There are now 49 UTCs in England. UTCs are conventional schools, in the sense that they follow the same national curriculum as other schools in the UK, but they work with universities and employers to integrate technical hands-on learning into the rest of the curriculum.

The London Design and Engineering UTC (LDE UTC) has gone further, developing its own initiatives specifically to address the skills gap for employers while also meeting the goals of its school curriculum. Within its system:

- The syllabus for every school subject is broken down into its constituent modules and learning aims
- Opportunities for innovative projects are identified, that incorporate work-based learning where possible, or otherwise relevant skills such as digital literacy and creative problem solving. The school works directly with employers to develop project briefs, to ensure that they are relevant to both the curriculum and to employers’ problems
- Students can see the relevance of the project, and are highly motivated to complete the project and learn what they need to do so

The school has started setting an overarching problem theme each term, in conjunction with an employer / corporate partner. Past themes include problems around Future cities (working with Fujitsu), virtual collaboration (Google), and effective water supply (Thames Water). During each theme, industrial partners work with all teachers throughout the school to incorporate relevant thematic content into their regular lessons. All subjects then contribute students’ work towards an overarching multifaceted project, whose conclusion is displayed in an exhibition at the end of the school term.

## Benefits to Students

The UTC model of teaching has clear educational and employment outcomes for students, including direct contact with industry leaders, increased motivation in their studies through the use of highly relevant business case problems, and teaching methods and content that is more in harmony with the needs of companies. Many students also spend time directly working or pitching the result of their innovative projects to company representatives, and find themselves adding value directly to the company through this experience. Thanks to its successful methods, LDE UTC is able to promise that all of its students will either enter apprenticeship or university upon leaving the college.

## Benefits for Employers

By making the course content more consistent with problems faced in industry, employers know that the students applying to apprenticeships will be familiar with the kinds of issues they will be facing in their new roles. Corporate partners know that students have been trained using the same tools and software that they themselves use. The students are more likely to be proficient and dedicated employees in future. In the case of LDE UTC, some employers are so confident in the quality of candidates that they reserve a certain number of apprenticeships each year to graduates from the school.

## Benefits for Schools

With regard to the wider school system, standards and practices for industrial collaboration are already being replicated more broadly. For example, LDE UTC and several partner colleges worked closely with Fujitsu to develop CoDE, the “Certificate of Digital Excellence”. CoDE operates primarily as a initiative to improve the industrial currency and digital literacy of teachers. It is expected that further certificates and standards will arise in future to provide assistance and frameworks for other forms of collaboration.

**The UK case highlights the following guiding principles in work-based learning:**

**Principle 4: Systematic cooperation between VET school or training centres and companies**

**Principle 13: Career guidance to empower young people to make well-founded choices**

**Principle 17: Ensuring the content of VET programmes is responsive to changing skill needs in companies and society**

**Principle 18: Fostering mutual trust and respect through regular cooperation between the apprenticeship partners**

**Principle 19: Ensuring fair, valid, and authentic assessment of learning outcomes**

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## Practical Project Work Model in Italy



In Italy, a new law was passed in 2015 with a goal to renew educational system by gaining work experiences and foster awareness of employment. The law “[La Buona Scuola](#)” has a feature for (school-work alternation or “[Alternanza scuola lavoro](#)”, which is now extended at all third-year, fourth-year and fifth-year high school students.

However, in 2016, after 1 year from the on Law Work-related learning, some critical remarks were analysed as follows:

*“..Due to lack of statistical data, we apply critical reasoning and comparative analysis with a view to showing that work-related learning is indeed able to increase employability through two main channels: first, it raises the human capital of recipients by providing general work-related competencies; second, it enlarges the network of contacts that may turn out to be useful to find a job once entering the labour market. Nonetheless, work-related learning does not provide job-specific work experience, which requires a longer time span. There is still a long way to go towards involving firms – especially in southern regions, where they are less numerous - as well as toward overcoming the cultural resistance from many stakeholders.”*

Ref. [Clorinda Maisto, Francesco Pastore - Alternanza scuola-lavoro: un bilancio preliminare a un anno dall'attuazione](#)

In order to overcome the above challenges, development projects have been initiated. Here we describe and analyze findings from one of them, the Alyante project that lasted 2 years **and involved 20 students**. The students of Istituto Tecnico Tecnologico Buonarroti - Pozzo from Trento were assigned to carry out the analysis and development of a supporting software for

commercial offer to be used by Small and Medium Enterprises – the software was named Alyante (Team System).

The project was carried out in **Secondary School Buonarroti - Pozzo**: a Technical and Vocational School for Technology (Business Information System) in a location of Pozzo in Trento. The hosting business partner was **Aldebra Spa**, a specialized ICT provider (IT system integrator) with more than 170 employee with more than 30 years of experience in Trento.

### Description of the project

In the project, students were engaged with authentic, practical development needs of a hosting enterprise. The project phases were the following:

- The students started with the analysis of a static pdf document and an excel bearing the price list, technical configuration rules, requirements and product technical data sheets
- Then the students, through a continuous interfacing with the company tutors, have, in a first phase, collected and analyzed the requirements expressed by ALDEBRA (client) for the purpose of defining and proposing one or more possible proposals;
- Subsequently, they prepared the document "feasibility study" (with the complete analysis of the project and the operational notes for the creation of an interactive tool based on the contents of the initial pdf document).
- The study was then shared and approved by ALDEBRA staff, thus constituting the document base on which the development and implementation of the solution was started.
- At pre-established intervals the team - made up of company representatives and class representatives - met to evaluate the progress of the work and to verify the overall quality of the work.
- Almost completed, two young people of the class were hosted by the company and worked closely with tutors and other colleagues involved to refine the solution and the last details in the realization of the project.
- The project carried out by Aldebra with the Buonarroti Institute was also presented as part of the Tu Sei Project, born from the collaboration between Confindustria Trento and the Autonomous Province of Trento and it obtained a recognition as the best project made for the category.

Based on the experiences from the project, the following benefits could be identified for the stakeholders.

### Benefits for students

By participating to the project we have developed work-in-team abilities and problem-solving competences in a creative and novel way. The students faced a real problem and after an analysis guided by teachers and representatives from enterprise they were pushed and stimulated to find a solution, develop the software and test it. Some students were also experiencing a work-based learning experience in the enterprise. Another added value is connected with the presentation of the transfer of knowledge acquired via video they have produced at the end of their experience



The students were enthusiastic about the experience: for some of them was more important the possibility to work together with high-skilled professional from Aldebra, for others it was relevant the ability to solve real-case problems.

### Benefits for school educators (Tutors/Teachers)

They consider the experience very positive because the students had the possibility to work in a real project by applying the skills and competences learned at school. Thanks to the project the students became more responsible by living a real case business opportunity.

### Benefits for the hosting business partner

In Aldebra all the staff was positively impressed by the engagement of the students both at school and in the hosting venue.

### Innovative nature of the case

The case is innovative in its context of application and also in Italy where it is very rare the connection within industry and students. The students were assigned to analyse and solve a real problem coming from market needs. Another relevant aspect of innovation is connected with the final outcome that is a software sold in the real market. The Italian case highlights the following guiding principles in work-based learning:

**Principle 6: Supporting measures that make apprenticeships more attractive and accessible to SMEs**

**Principle 7: Finding the right balance between the specific skill need of training companies and the general need to improve the employability of apprentices**

**Principle 8: Focusing on companies having no experience with apprentices**

**Principle 9: Supporting companies providing apprenticeships for disadvantaged learners**

**Principle 10: Motivating and supporting companies to assign qualified trainers and tutors**

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## Photos:

Alyante project team meeting with stakeholders:



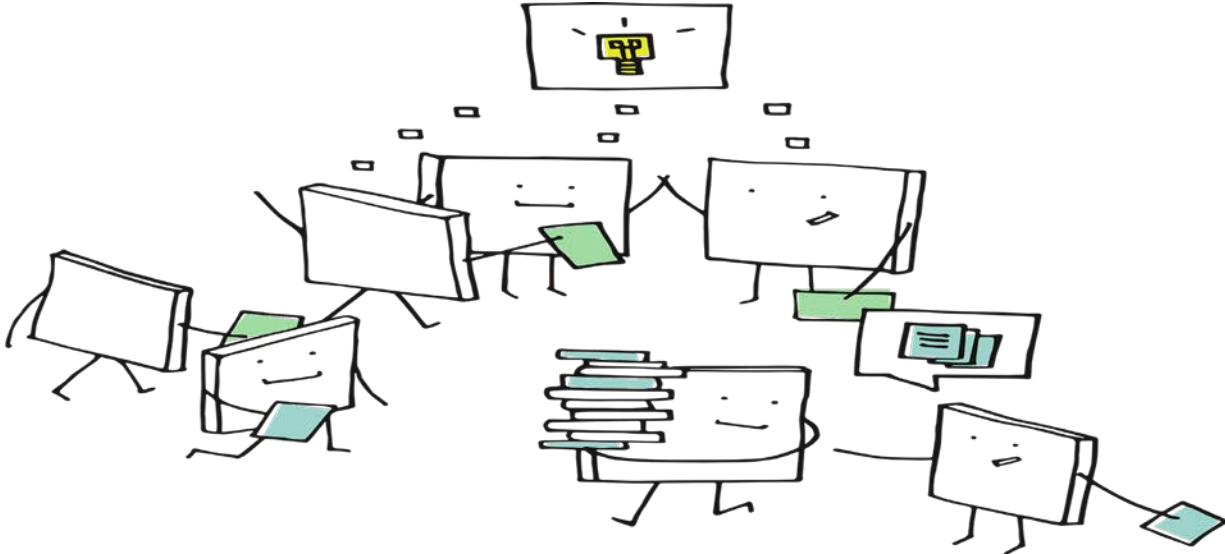
Source 24/02/2019: <http://www.alternanza.miur.gov.it/TNTF01301D.html>

Logo of the software:



21/05/2019: <https://www.sogesi.it/alyante-enterprise/>

## CHAPTER 2: WORK-BASED LEARNING METHODOLOGY



Source 21/09/2019: Image by [Manfred Steger](#) from [Pixabay](#)

### Key Concepts in Work-Based Learning

Introduction of learner-centred thinking has brought new aspects to how we discuss learning, the learning process and its outcomes. When talking about work-based learning (WBL) *Intended Learning Outcomes* and *Competences* are certainly two of the key concepts being widely mentioned in different kinds of texts. But what do we mean by these concepts? How do they frame the way we talk about learning in the context of work, and the benefits of such a learning model to learners and teachers in education and workers and their employers at the workplaces?

Learning outcomes are statements outlining what a learner is expected to know, understand or do after completing a learning process. In comparison to traditional, teacher-oriented approach in education, learning outcomes highlight the result of the learning in students, not the activities performed by the teachers.

Competence is not as straightforward to define as a concept. Ranging from a dictionary definition of an “ability to do something well”<sup>1</sup> to a more policy-related definition of “a set of knowledge, skills and attitudes”<sup>2</sup>, the term seems to elude a precise and secure definition. In educational policies, such as OECD or European Union reports, competence is oftentimes used broadly as a quality that

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<sup>1</sup> Cambridge Dictionary, 2019

<sup>2</sup> see e.g. Davies, 2017

fits any professional field. Hence, transversal competences or soft skills are described broadly to fit a range of professional situations. However, educational research has studied the notion of competence as something contextual, and specific to a given situation.<sup>3</sup> Building on this notion, it is important to be sensitive in understanding that the knowledge, skills and attitudes which are valued in one professional context may not be valued in the same way in another context. Furthermore, learners who feel competent in one occupational situation may feel incompetent in another situation.

In order to better understand work-based learning and how it differs from the traditional, school or college –based learning strategies, we highlight in the following the meaning of context to work-based learning and role of a teacher in facilitating learners development in the circumstances of work. Based on learning research we will later suggest a model for work-based learning in VET that comprises of different aspects affecting student learning.

Following a critique of Guile and Griffiths<sup>4</sup>, general education and vocational education and training (VET) have undermined the importance of context upon learning. Researchers argue, that models on work-based learning have skipped two critical issues relevant to the process of learning in workplaces: *firstly*, the extent to which students learn to ‘negotiate’ their learning during work experience and *secondly*, how they are supported in relating formal and informal learning in the context. Knowledge is embedded in work roles and knowledge is unevenly distributed through the workplaces. Furthermore, the understanding of key skills, or competences, vary between language and culture<sup>5</sup>, not to mention the different workplaces.

What does this mean for the teacher? It is important to acknowledge that teachers need to negotiate the learning paths for their students at the workplace and to bear in mind that not all workplaces are equal as learning environments. Students may need to be rotated between companies in order to have them exposed to a variety of learning opportunities. This is the case especially if the companies or organizations are small-scale. A student training for hotels, restaurants and cafeterias may indeed need to visit all the above mentioned venues in order to understand what it means to be a waiter and work in collaboration with other and with clients.

Coming back to definitions, a widely used definition of competences and learning outcomes comes from the European Union:

**Competence** means the proven ability to use knowledge, skills and personal, social and/or methodological abilities, in work or study situations and in professional and personal development. In the context of the European Qualifications Framework, **learning outcomes** means statements regarding what a learner knows, understands and is able to do on completion of a learning process, which are defined in terms of knowledge, skills and responsibility and autonomy. (The Council of European Union, 2017).

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<sup>3</sup> e.g. Guile and Griffiths, 2001

<sup>4</sup> Guile and Griffiths 2001, see also e.g. Gick, 1995; Eraut, 1999, Beach & Vyas, 1998.

<sup>5</sup> Guile 2002

In this definition, an interesting addition is made to learner responsibility and autonomy. Logically, not only teachers are responsible in quality learning at the workplace. In school, teacher is often seen as the source of learning. In work-based learning, the experience is the “teacher”. However, students need to develop learner responsibility and autonomy before and during their training periods at the work places. In addition, the other actors or agents - people involved in learning at the workplace - have great importance in reaching the learning outcomes. These may include workplace instructors, tutors or mentors. Also they need to participate in negotiating the learner’s path at the workplace for optimal learning.

When looking at the learner him or herself, how does one develop agency? In research, *learner responsibility* and *learner autonomy* refer to learner being able to take charge and to be active in their own learning. This viewpoint should not be viewed as an attempt to reduce the scope of responsibility and autonomy only to working-life related situations, such as task performance. Learners need also to develop positive attitudes to their own learning and potential for lifelong or continuous learning. At the workplace students are exposed to moral and ethical codes of the workplace and start to develop their own professional identity. Once again, teachers and other trainers in college and at the workplace are important in developing good qualities for further professional development. Furthermore, teachers should not only discuss with their students how their learning at the workplace meets the criteria set by the educational institution, but also reflect on how lessons learnt in one situation could be transferred to another situation.

## Model of Integrative Pedagogy for Work-Based Learning

In the previous chapter we highlighted how important it is for teachers to help students in getting the most of their experiences at the workplaces and to make sure students are able to understand the logic of working life. To summarize the theoretical views on work-based learning, we present the following Model of Integrative Pedagogy<sup>6</sup> for Work-Based Learning.

According to Tynjälä<sup>7</sup>, there are three kinds of learning at the workplace. *Firstly*, there is incidental and informal learning. This can be described as a side-effect of work. *Secondly*, we have intentional, but still non-formal learning activities related to work - mentoring, intentional practicing of certain skills or tool use. *Thirdly*, there is formal on-the-job and off-the-job training. This includes a range of learning opportunities from small workshops to training programs. Despite of the different settings, learning is considered as social participation.

Through social participation, learning organizations not only socialize people into existing practices, but also *purposefully develop new practices*. Hence, a workplace can be seen as a context for knowledge creation and therefore it can be valuable for students and teachers alike in their

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<sup>6</sup> Tynjälä 2007, see also e.g. Paavola, Lipponen, and Hakkarainen 2004

<sup>7</sup> Tynjälä, 2007

attempts of becoming more working-life oriented. Furthermore, emphasis is shifting from the learning of individuals to learning of communities, organizations, inter-organizational networks, and even learning of regions<sup>8</sup>. Work and the workplace can provide learning opportunities not only to workers, but for students, customers, and other stakeholders alike.

To conclude, learning at the circumstances of work has special characteristics different to learning at the classroom. Based on the above views, we can list a few important factors on work-based learning relevant to the topic of this project:

- Learning at the workplace is contextual, and learning is characterized by contextual reasoning
- Theory and practice at the workplace is seamless, and learning develops situation-specific competences. It may be difficult to later connect WBL to abstract or theoretical reasoning in school.
- Many activities at work require collaboration with other people, and person's ability to function successfully depends on the performance of other individuals.
- Group working promotes knowledge exchange and sharing of expertise. In order to make this possible, ability and possibility to learn in collaboration with others is crucial to newcomers, like students.

In order to make the most of learning at the workplace, students and teachers need to design *meaningful interaction* and *integrate theoretical and practical knowledge* when developing professional competence<sup>9</sup>. To illustrate this, The Model of Integrative Pedagogy for Work-Based Learning consists of four basic elements tightly integrated with each other: theoretical, practical, self-regulative and sociocultural knowledge. Many of these elements are well-known to teachers in VET. The question actually is the Model support learners' purposeful development of new practices as discussed earlier on in this chapter?

In the Model of Integrative Pedagogy, integration of theory, practice and self-regulation can be seen as a problem-solving process. Students face and solve practical problems in the learning process. They also take into consideration various related conceptual problems and while attempting to solving them, they need to integrate different forms of knowledge. Learners utilize a form of thinking called integrative thinking while they are engaged in their learning process.<sup>10</sup>

Image 2 aims to describe how to design Work-Based Learning by using the Model of Integrative Pedagogy:

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<sup>8</sup> Tynjälä, 2007

<sup>9</sup> Heikkinen, Tynjälä, and Kiviniemi 2011; Tynjälä 2008, 2009; Tynjälä, Häkkinen, and Hämäläinen 2014; Tynjälä et al. 2006, see Tynjälä 2016

<sup>10</sup> Tynjälä 2016.

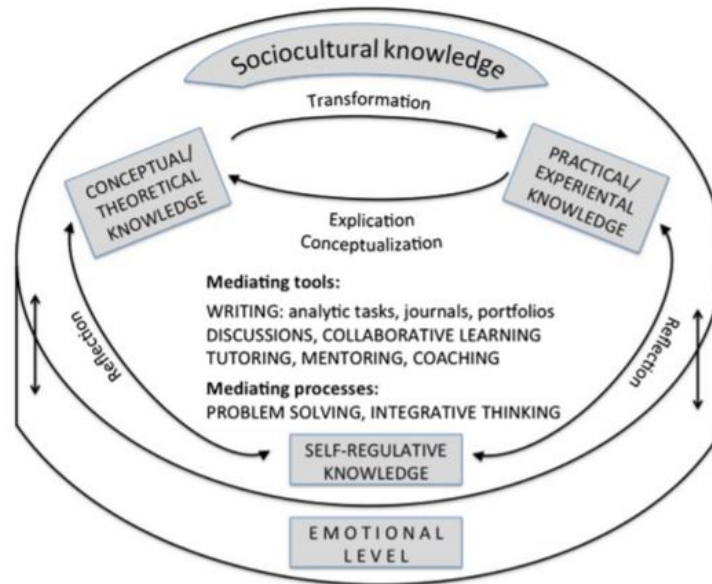


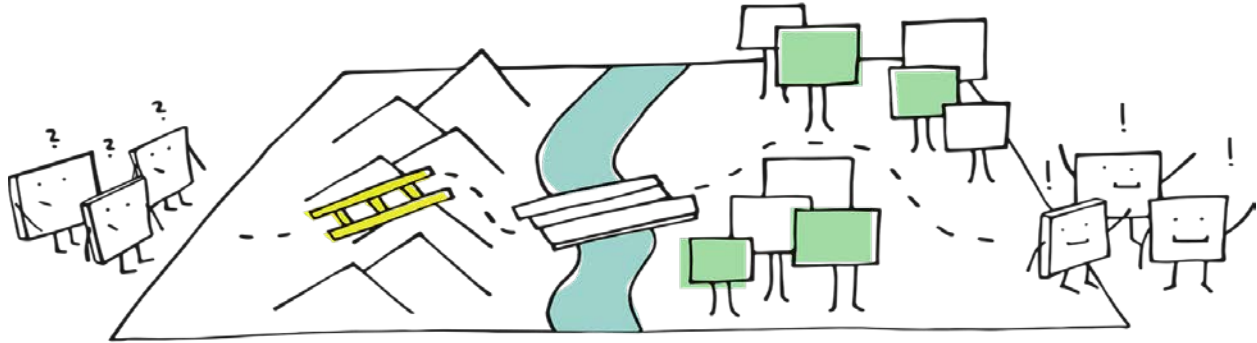
Image 2: The Model of Integrative Pedagogy. (Tynjälä, 2016, original source adapted from Heikkinen, Tynjälä, and Kiviniemi 2011; Tynjälä 2008; Tynjälä, Häkkinen, and Hämäläinen 2014.)

The development of new practices is mediated in the Model by various tools and processes. The researchers have also included metacognitive and reflective skills and knowledge into the model. These are needed for making connections between different forms of knowledge. Furthermore, recent research (e.g. Reyes et al. 2012) has brought into attention the role of emotions within the social competence development and therefore the emotional level of learning is included in the Model of Integrative Pedagogy.

Based on this model, the following chapter aims at discussing how teachers need to develop their pedagogies to benefit from the promises of Work-Based Learning methodology in their education.

## CHAPTER 3:

### WORK-BASED LEARNING PEDAGOGICAL APPROACH



Source 21/09/2019: Image by [Manfred Steger](#) from [Pixabay](#)

In this chapter we discuss the following topics relevant to pedagogy:

- How is social participation in learning regulated?
- How can teachers design meaningful learning experiences?

#### Learning as social participation

Work-based learning models emphasize the importance of personalized study plans and partnerships between the training provider and the employer. These are needed in order to regulate or make the integration to the learning community easier for students.

The social theory of learning as described by Lave and Wenger (1991) is based on the assumption that learning is located in social participation and dialogue. In work-based learning, there is a novice or newcomer, and the experienced others at the workplace. As a learner engages with social relationships at the workplace, the learner begins to shape his or her own identity. In comparison to learning in a classroom, knowledge and skills in work-based learning are context-dependent (learning *at the workplace*).

Concerning the development of expertise, researchers speak for the importance of newcomers' journey from a periphery to the centre of a community of practice. In this journey the newcomer is not expected to have much knowledge and skills, but is given important and meaningful tasks to get acquainted with. By participation in the workplace, the novice gradually "learns the trade", and becomes more competent. During this journey, the newcomer may also become a member of a work community, which shares practices and information between each other.<sup>11</sup>

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<sup>11</sup> Lave & Wenger, 1991.



From the perspective of teachers involved in developing pedagogy for work-based learning, it is important to notice that learners in WBL need help from others and teacher to generalize the knowledge and skills to other contexts (workplaces). Like mentioned before, in some situations individual knowledge is necessary but not sufficient. Workers are not able to perform on their own but need the knowledge and skills of other actors or agents involved in the learning situation. Furthermore, knowledge is shaped by context it is produced or applied in.<sup>12</sup> Learning to manage a process in industry may differ from managing a process in services. Therefore it is important for the teachers to look closely at the learning situations and what others bring to the learning process, and based on that design opportunities for meaningful interaction and try to integrate the different learning opportunities present in the situation for optimal learning. This may mean, for example, structured discussions at the workplace with teacher, learner and a workplace tutor to clarify what was learned and how does it relate to the curricula at school.

### Designing meaningful learning experiences

As argued by Billett (2004), newcomers who enter workplaces also come with prior learning and competences to the new context, and should be seen as agents in their learning. Therefore a novice cannot and should not be understood as someone who is new to work-based learning, even if he or she is new to learning in a specific context.

Like discussed before, learners need the help of others in order to make most of the affordances at the workplace. According to learner interviews<sup>13</sup>, the need for help raises e.g. from limited transferability of learning, inadequate support from work colleagues, a lack of exposure to new ideas and inability to divert from established practices. On the other hand, if mentoring or tutoring is at hand, learners report<sup>14</sup> participation in a group of learners at a workplace allows students to look beyond the “here-and-now”, to understand how workplaces and practices differ and how they are similar.

In conclusion, Work-Based Learning is a powerful methodology to achieve working-life relevance in education. However, it is important to make sure that contexts in work-based learning vary and that learners are able to shape their learning experiences with others and a teacher.

As described in the Model of Integrative Pedagogy, learners need to integrate different forms of knowledge when they are attempting to solving working-life oriented problems. In this exercise, it is very important that teachers are able to augment the practical experiences, which were gained at the workplace, when learning in college – and to make the connections visible between practice and theory. This can be done, for example, by inviting learners to reflect their ideation and creative problem solving in a group with each other and with other professionals in the field.

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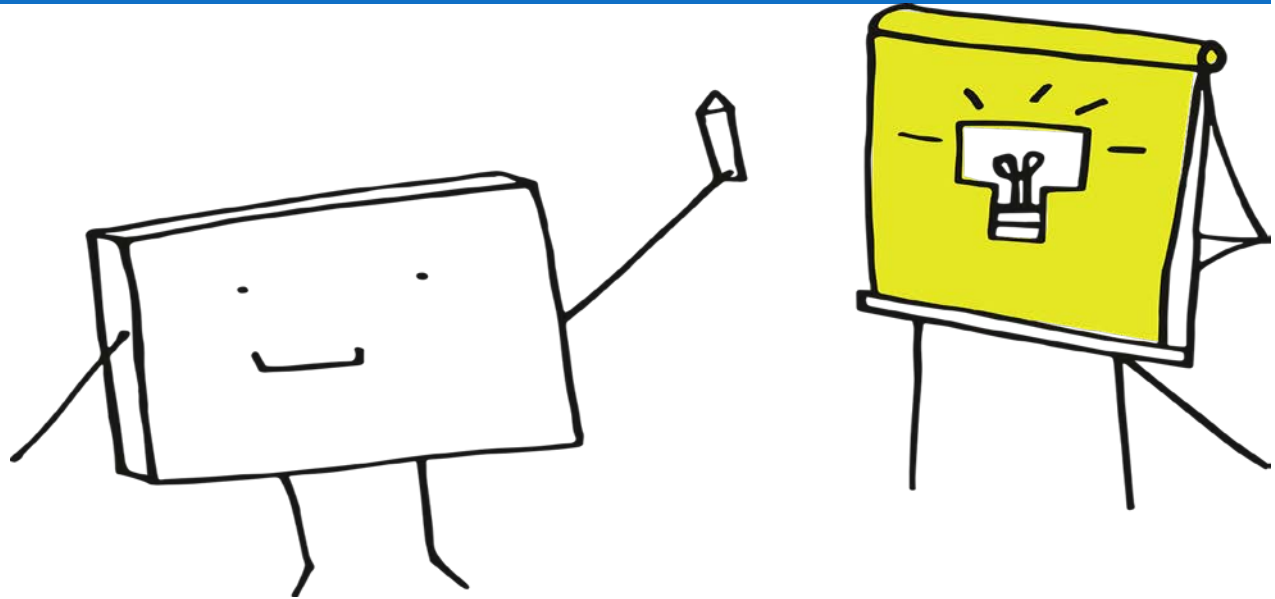
<sup>12</sup> Eraut 2000

<sup>13</sup> Siebert et. al 2009

<sup>14</sup> Guile and Young, 2002

## CHAPTER 4:

# WORK-BASED LEARNING IMPLEMENTATION: TIPS AND PRACTICAL SOLUTIONS



Source 21/09/2019: Image by [Manfred Steger](#) from [Pixabay](#)

Based on the experiences highlighted here by the project partners, the theoretical studies and the presented Model of Integrative Pedagogy the following tips and practical solutions have been identified to facilitate work-based learning implementation.

### Policies

- In work-based learning, such as apprenticeship training, students acquire the knowledge and competencies that employers need. In order to facilitate this, teachers need to adjust the balance of theoretical education and practice in the companies so that the students can keep up with the pace of upskilling.
- New forms of agreements between employers, schools and students add flexibility to Work-Based Learning. More simple and practical agreements may help in finding new locations for work-integrated learning for students, especially in smaller municipalities.
- It is important to take into account the principle of lifelong learning, i.e. by offering learners the possibility of taking part of a qualification now and returning to the VET system at a later point in time.
- It is important that all stakeholders in education and world of work participate in the development of innovation in vocational education and training. Such stakeholders include

e.g. students, employers, and entrepreneurship organizations, federations of enterprises, teachers and researchers.

## Practices

- Students need to learn how to develop as a learner. Teachers can help in this by offering them work-related challenges for creative problem solving. One way of doing this is to set the whole school a large multifaceted problem case to solve, with relevance to many subjects. Another way could be by incorporating relevant skills such as digital literacy to work-based learning.
- For students the social participation in a work community or organization may be a great source for motivation. Work-Based Learning may give a chance to work together with high-skilled professionals and to learn what is important in companies at the moment.
- Learners in work-based learning benefit from reflection with other learners and with teachers. It is important that teachers augment the learning experiences with the learners.

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Author: Thomson, Kate Eileen; da Silva, Robyn; Draper, Peter; Gilmore, Anne<sup>4</sup>; Majury, Niall; O'Connor, Kevin; Vásquez, Anete; Waite, Jacqueline<sup>1</sup> UNIVERSITY OF SYDNEY, kate.thomson@sydney.edu.au<sup>2</sup> FLINDERS UNIVERSITY, dasi0014@flinders.edu.au<sup>3</sup> Peter Draper, UNIVERSITY OF HULL, p.r.draper@hull.ac.uk<sup>4</sup> Anne Gilmore, UNIVERSITY OF QUEENSLAND, a.gilmore@ozemail.com.au<sup>5</sup> NiallMajury, QUEENS UNIVERSITY BELFAST, n.majury@qub.ac.uk

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Author: Fleming, Jenny<sup>1</sup>; Haigh, Neil J<sup>1</sup> Auckland University of Technology, Auckland, New Zealand

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Author: Garnett, Jonathan

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The development of mapping tool for work-based learning activities

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