

Co-funded by the
Erasmus+ Programme
of the European Union



RAY HUB

**PERSONALIZED
WORK- BASED
LEARNING**



Regional Alliance for Youth

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Introduction into Work-based learning and RAY work-based learning model

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years ago the educational system wouldn't have considered a future where the student decides which direction his/her education should take instead of relying on the teacher to direct them to what is (and what isn't) relevant.

The educational sector should be the driving force and the stimulator for all the changes that surround us. At least it was supposed to be so. But at the moment and even more in the future, the changes in the society and in the labour market are happening and will happen so fast that we can't gain and won't be able to gain the skills or knowledge that fast, we could cope with all of them.

There have been identified two emerging trends that have led us to believe that the sector is about to go through a change in educational paradigm.

First

is the shift from a traditional, formal education, to work-integrated learning.

Historically, learning has been concentrated in the years of our formal education, before our career proper began. More recently, learning has become something that we undertake periodically at the start of each new phase of our career, a career of serial specialisation driven by the rapid, and inevitable, ageing of our knowledge stocks. This is an environment where individuals are constantly on the lookout for interesting and useful knowledge, knowledge that they will 'pull in' and learn to fill a gap in their current knowledge, a gap that is preventing them from completing a project or reaching their goals.



Second

is the emerging trend for employers to move away from using formal credentials as the gold standard against which all candidate employees are measured. The suitability of a candidate is increasingly being judged in terms of their observable attitude and behaviours, their broad experience and track record of integrating new knowledge and skills into their work.

For example, Google (a leading indicator in business practices) has shifted its hiring practices from trying to find the most highly credentialed specialists possible, to focus on identifying what they call 'smart creatives' – smart and capable generalists who demonstrate the attitudes and behaviours that will enable them to be effective learners and team players, with formal credentials (should the candidate hold them) playing only a minor role. Historically, being educated meant possessing the knowledge and skills that allowed a person to participate in the traditional professions. In the rapidly changing world of the 21st century, the focus for many workers is shifting from the analysis and evaluation required to optimise a firm's operations, to quickly creating new products and services in response to a rapidly changing market. Today, being educated increasingly also means having the attitudes and behaviours that enable one to adapt quickly to changed circumstances.

The questions confronting the education sector are not just those of pedagogy or technology, but of purpose and role.

While knowledge stocks might be giving way to knowledge flows, individuals still need to know enough to be conversant with, and productive in, their chosen fields; they will also have to be sensitive to the need to continually update their knowledge stocks.

This raises a number of important questions:

- What are the skills that students need to develop to help them know what they need to learn in later life when solving problems?
- How does an educator impart the attitudes and behaviours of the new paradigm students require to succeed?
- And how can an educator create an environment where students can explore the intersection between their skills and interests, enabling them to find the domain of inquiry that they will pursue for the length of their career?

It is possible that, sometime in the not too distant future, rather than having one education sector, we'll have two: **an old, industrial-era sector** that is increasingly marginalised and irrelevant for the majority of the population, and **a new social-era sector** dominated by social media and 'global tribes' with which a majority of people engage.

They're well aware that individuals with better skills and qualifications have historically enjoyed lower unemployment rate and higher earnings.

Both employers and students

are dissatisfied with the nature of the education that institutions are providing. Employers complain that educators aren't providing students with the skills they need to succeed in the workplace. Students, on the other hand, struggle with the disconnect between educators' calls for engaged citizens and independent thinkers and the credential-based admittance criteria tertiary institutions actually use to select students.

The creative and collaborative pedagogy practised during the majority of K-12 education goes by the wayside in the later years as secondary schools focus on helping students obtain the test scores needed for admission to tertiary institutions.

Products

are being transformed into value-added services – a process called 'servitisation' – erasing the distinction between sectors and industries in the process. Monolithic, integrated firms are giving way to business ecosystems, or business value networks, where firms do for themselves only what they can't have done more effectively externally.

Today's employees are increasingly focused externally, intent on creating new opportunities rather than optimising internal operations. Employers are asking them to design new products, collaborate with networks of partners and customers to find new solutions to old problems, as well as find new problems to solve. These design thinking practitioners (the computer engineers, designers and architects) who create these new products and services, are supplanting the administrative professionals from the information revolution.

These individuals are the 'smart creatives' at the heart of firms such as Google and Facebook. They are the passionate explorers with a drive to learn and improve that goes above and beyond, and who actively seek out others to help find solutions to challenges.

This gradual shift from internal optimisation to external discovery has resulted in a steady rise in the proportion of creative professions and professionals in most economies of the world. And not only in the field of IT discipline but has reached all possible professional disciplines.

The same mindset of "creating new opportunities" or being "smart creatives" is important at all levels of education, not only for high skilled employees, entry levels or students that show higher abilities but also for middle skilled, low skilled employees, VET students, high-school students, higher VET students etc. It's not only about the ability to know something or to learn but about the necessity to act that way in the modern labour market. Nevertheless, everybody needs to compete in the very challenging new era labour market. It's a simple story behind and it goes about the fight for survival. Everybody needs to find his/her place inside the very competitive today's labour market. It may be an IT engineer who needs to look for solutions to constantly changing products, services, society or it may be a car mechanic who can't be competitive any more and can't earn enough money to survive only by repairing the cars. They must be both very creative to find new ideas and again and again and again to continue with the business, as an entrepreneur or as an employee.

Work-based learning models worldwide

Here are some very common definitions of work-based learning which are very relevant also for our RAY HUB model:

- it is an educational strategy that provides students with real-life work experiences where they can apply and develop many skills (transversal skills, soft skills, technical skills) and develop their employability.
- it integrates the school curriculum with the workplace to create a different learning paradigm.
- it deliberately merges theory with practice and acknowledges the intersection of explicit and tacit forms of knowing.
- it is a part of the curricula that aims at a win-win situation where the learner's needs and the industry requirement for skilled and talented employees both are met. It targets to bridge the gap between the learning and the doing.
- its strategies provide career awareness, career exploration opportunities, career planning activities and help students attain competencies such as positive work attitudes and other employable skills.
- it encompasses a diversity of formal, non-formal and informal arrangements including apprenticeships, work placement and informal learning on the job. The key driver is the need for active policies to secure learning that meets the need of the workplace.

Below you can find the list of some examples of different work-based learning models from all around the world:

Practical activity

Work-based learning in school

Overview

WBL can be integrated in a school-based programme through on-site labs, workshops, kitchens, restaurants, junior or practice firms, simulations or real business/industry project assignments. The aim is to create 'real life' work environments, establish contacts and/or cooperation with real companies or clients, and develop entrepreneurship competences

Population Served

Students

Core Purposes

Exposure to the world of work

Practical activity

Internships

Overview

- Provide participants with an opportunity to learn about a career or industry by working for an employer in the field of interest for a limited period of time
- A form of experiential learning, often tied to a secondary or postsecondary program of study, that enables participants to gain applied experience, build professional and technical skills, and make connections in a field of interest

Population Served

- Secondary and postsecondary students
- Opportunity youth
- Recent college graduates
- Working-age adults

Core Purposes

- Exposure to a career field and/ or the world of work
- Development of professional skills
- Academic learning
- Job (temporary)

Practical activity

Co-ops

Overview

Cooperative education is a structured method of combining classroom-based education with practical work experience. A cooperative education experience, commonly known as a "co-op," provides academic credit for structured job experience. Cooperative education is taking on new importance in helping young people to make the school-to-work transition, service learning, and experiential learning initiatives.

Population Served

- Secondary and postsecondary students

Core Purposes

- Academic learning
Development of career-track skills
- Job (temporary)

Practical activity **On-the-job training**

Overview

- Workplace-based opportunity for participants to develop career-track skills needed for entry to a particular industry or advancement along a career track
- Can support rapid re-employment of individuals following mass layoffs
- Can be used to retrain incumbent workers if technological or other changes within a workplace demand the development of new skills
- This form of WBL includes on-the-job training periods in companies. These periods vary in length and typically cover shorter internships, work placements or traineeships that are incorporated as a compulsory or optional element of VET programmes leading to formal qualifications.

Population Served

- Dislocated workers and low-skilled adults may be incorporated in individual service plans for opportunity youth
- Students

Core Purposes

- Development of career-track skills
- Job (permanent)

Practical activity **Transitional jobs**

Overview

- Designed to address challenges faced by individuals with barriers to employment
- Time-limited employment, through which participants gain professional skills and establish a successful work history, is combined with a range of supportive services, including employment services

Population Served

- Opportunity youth
- Individuals with barriers to employment

Core Purposes

- Exposure to the world of work
- Development of professional skills
- Job (temporary)

Practical activity **Apprenticeships**

Overview

- Intensive work-based learning experiences that generally last from one to six years and provide a combination of on-the-job training and formal classroom instruction
- Intended to support progressive skill acquisition and lead to postsecondary credentials and, in some cases, degrees
- An apprenticeship involves the student working for an employer where he or she is taught and supervised by an experienced employee of the chosen organization. The student is periodically evaluated for progress as per the skills and knowledge acquired, and maybe granted wages accordingly. At the end of the course, the student receives a certificate of service. The student learns in a realistic environment and gets the opportunity to apply his or her knowledge in real world scenarios.
- Apprenticeships formally combine and alternate company-based training (periods of practical work experience at a workplace) with school-based education (periods of theoretical/ practical education followed in a school or training centre), and lead to nationally recognised qualification upon successful completion. Most often, there is a contractual relationship between the employer and the apprentice, with the apprentice being paid for his/her work. The term apprenticeships is defined and understood differently in many countries and for research purposes.

Population Served

- Individuals seeking to enter a new career field
- Opportunity youth interested in an industry Incumbent workers seeking advancement

Core Purposes

- Academic learning
- Development of career-track skills
- Job (permanent)

Practical activity

Job shadowing

Overview

- Job Shadowing is a short- term opportunity that introduces the student to a particular job or career by pairing the student with an employee of the workplace. By following or ‘shadowing’ the employee, the student gets familiar with the duties and responsibilities associates with that job.
- New job training: An individual planning to take up a different role in the same organization may be asked to shadow the current incumbent for a couple of days to months to get a better idea of his or her role, as well as understand the particulars of the same without the commitment of the responsibility. This helps the individual to be more confident, aware, and also better prepared to take up the role. For the organization, it reduces the chances of failure and reduces the time required for the individual to be fully productive.
- Career development: With multiple options available for somebody to grow in an organization, job shadowing can help to get a better sense of options available and the required competencies for the same. An employee may shadow senior employees in various positions/functions to appreciate and get a better idea about what it takes to build a career there.
- Developing expertise: At the core of job shadowing is its ability to transmit knowledge and expertise to another person. By doing a planned work, job shadowing can support knowledge management and ensuring that expertise and knowledge are not lost.
- Leadership development: Many organizations use job shadowing as a tool for leadership development. Aspiring leaders are given opportunities to shadow senior leaders and learn from them. It complements classroom learning and aspiring leaders get to experience first hand what it takes to be a leader.

Population Served

- Students
- Employees

Core Purposes

- to learn and exchange ideas
- helps in networking, exploring opportunities, giving/receiving feedback, and collaboration with different departments

Practical activity

Business/industry field trip

Overview

Field trips offer the students an insight in the latest technical advancements and business strategies of an enterprise. Students also gain awareness of the various career opportunities available and understand the driving forces of the community’s economy.

Population Served

students

Core Purposes

gain awareness of various career opportunities

Practical activity

Entrepreneurial experience

Overview

This includes setting up of specific business, right from the planning, organizing and managing stage to the risk control and management aspects of a business.

Population Served

Students

Core Purposes

Development of entrepreneurial skills

Practical activity

School-based enterprise

Overview

A school-based enterprise is a simulated or actual business run by the school. It offers students a learning experience by letting them manage the various aspects of a business

Population Served

Students

Core Purposes

Development of entrepreneurial skills

Practical activity

Service learning

Overview

This strategy combines community service with career, where students provide volunteer service to public and non-profit agencies, civic and government offices

Population Served

Students

Core Purposes

- Personal and social skills development
- career preparation

RAY HUB – Personalised work-based learning model

1. Introduction into RAY HUB: Automotive/automation industry needs and young generation needs:

RAY HUB was designed on the basis of results of analyzing advantages and disadvantages of existing VET-business partnership models, work-based learning models, needs and interests of the Z generation as well as understanding the future trends in Slovenia, Finland and worldwide. The analyses were made in the frame of the work package 2 according to the collected data from students, VET teachers, in-company trainers, VET school and companies' leadership and other company experts as well as from the existing data related to the RAY project aim.

RAY HUB builds on needs and interests of a specific economic sector (in this project of automotive and automation industry) and young generation's needs. The success of student's/apprentice outcomes in the work-based learning process highly depends on the fulfilment of the student's/apprentice goals/expectations/interests/needs.

Main driving force for the fulfilment is the student's/apprentice motivation, his/her goal and in most cases "usability" of the knowledge and skills they gain inside RAY HUB.

Young people/students differ among themselves very much: different characters, abilities, social backgrounds, knowledge and skills' background, understanding, interests, behaviours. However, not every WBL activity in the VET system can match to every student, as well as not every employer prefers, implements or is able to deliver the same WBL activity in a VET system.

Those findings led us to design the RAY HUB which builds on diversity and offers various practical activities (user oriented), as well as respects both main end users: young people, as future employees, and employers, as those who need skilled and T shaped working force, to be able to challenge new era labour market. RAY HUB offers different practical activities.



NEEDS DRIVEN

Content and activities are handpicked based on automotive / automation industry and students' needs



PROJECT BASED

Project based approach allows practical learning through creative problemsolving



FLEXIBLE SET UP

Our activities and support adapts to student schedule: whenever and wherever



APPLICABLE KNOWLEDGE

Our industry partners will enable students to get the transversal competences needed in automotive and automation industry

* Ray hub is part of VET curriculum.

2. Key persons in RAY HUB and their main roles

Key persons inside the RAY HUB model work as a team.

Student

- is central to the WBL process and his/her inner driving force is motivation and self-initiative
- has the opportunity to find out what is he/she good at, develop his/her talent and potential and use it
- is co-creator of his/her individual plan for WBL
- enters RAY HUB with motivation and keeps searching to spread or find his/her own interests and needs in connection to his/her professional field or to personal growth
- meets a mix of professional disciplines, experiences and expertise from the worlds of business, technology or other industries. The linking factor is intellectual curiosity, personal drive and a capacity to work as a creative team, while inspiring rather than diminishing each individual's own creativity
- in the working environment is constantly on the lookout for interesting and useful knowledge.
- has the possibility to turn his/her theoretical knowledge into the practical experience
- is a part of the team, where they learn from each other, exchange experiences, views and make network
- regularly attends feedback from his/her tutor and in-company trainer.



Tutor – a VET teacher

- creates an environment where students can explore the intersection between their skills and interests, enabling them to find the domain of inquiry that they will pursue for the length of their career
- supports students in all possible respects regarding professional and personal growth
- organizes regular tutorials and discuss with the student the feedback
- builds strong, personal relationship with his/her student/s

The more connected the student feels to his/her tutor, the more the tutor is able to create trust and respect, essential ingredients for students to learn well. When a tutor listens and spends time building a relationship with his/her student, that tutor can:

- Truly personalize the learning
- Incorporate connections to the student's interests
- Teach or coach to the student's strengths
- Minimize the student's weaknesses

To enable the good teamwork and knowledge sharing the tutor is also in constant connection and interaction with the inter-company trainer

*See more in the section “tutoring” (p. 18.)

In-company trainer:

has similar role as the tutor, except that in-company trainer can focus more on sharing professional knowledge and skills from the world of work. Otherwise the roles are much similar and not treated separately.

To enable the good teamwork and knowledge sharing the inter-company trainer is also in constant connection and interaction with the tutor.

*See more in the section “tutoring” (p.18.)

Career counselor:

supports the tutor in the activities for a student, as agreed with the tutor, such as:

- identifying strong and weak points of individual student inside the RAY HUB
 - connects students with in-company trainer and tutor
 - support the RAY HUB students in developing transversal competences
- help students in:
- ▶ CV and motivation letter writing (mother tongue and English)
 - ▶ preparing interesting and problem solving-powerful presentations of hands on projects
 - ▶ self-promoting and presenting
- follows the whole RAY WBL process in order to use the feedback for career counselling to other students regarding RAY HUB and its benefits.

Brief user journey- STUDENT

1. Career Awareness

Guest speakers
Career day
Study/ Field trips
Career Fairs
Presentations
Videos
Transition visitation
to SME and Post
-Secondary Schools

2. Career Exploration

Career Guidance/
Advisement
Career Interviews
Job Shadowing
Student Portfolios
Internet Searches/
Reports
Research Projects
Internet Based Career
Planning Tool
Projects/Competitions

3. Instructional Related Activities

Connecting Activities

Entrepreneurship
Projects
School Based
Enterprises
Employability Skill
Attainment
Work related
Experiences
Establishing network
Creating Business
Partnerships

4. Work-based learning Placements

Work-Based
Learning Placement:
Employability Skill
Development
Cooperative
Education
Internship
Youth apprenticeship
etc.

3. RAY HUB crucial elements

Students match WBL activities according to their own needs and interests with the support of their VET teacher and in-company trainer

01

02

The inclusion in the WBL process is built on the motivation of all included actors

The model is focused on benefits for student and aims

03

04

In the model are included at least three actors: a student, the VET teacher and the in-company trainer or company expert; the VET teacher must stimulate the team work and the establishment of the network

The flexibility of time, place and relations should be respected

05

06

The model will be based on specific work-related tasks, hands on project

The model will be based on the interdisciplinarity and strong inclusion of competences

07

08

The VET teacher and in-company trainer should value also the non-formal gained knowledge, skills, experiences of the student during the WBL process

The student will have the possibility to gain the international experience inside this model, on-line or in-live or both

09

10

The VET teacher (tutor) or in-company trainer arranges for student also international tutor

All actors must tend to use the digital support and tools or on-line courses, as well as social media channels, during the WBL process. Also for the purpose of efficient time management.

11

12

User oriented, user friendly, keep it simple

RAY HUB structure

1. Flexibility

Although the main focus is still to get a real work experience in the companies, the experience is not limited any more only on companies premises but can be provided at home, at school labs, at the friend's place in the garage, in the virtual world etc.

Working hours and space are flexible in RAY HUB model and not limited only in the time set by the company working hours. Thus, it is very important that there is a constant interaction of sharing knowledge, skills, experiences, attitudes etc. among the students (at least two students), VET teacher as a tutor and in-company trainer.



2. Professional skills & transversal competences

RAY HUB focuses on professional knowledge/skills flows which are crucial for a today competitive labour market. It enables the constant sharing of professional flows from in-company trainer to student/apprentice and tutor due to their regular interactions and teamwork.

Through the analyses we have made in the automotive and automation sector, every working place today and in the future puts the transversal competences at the same level of importance as professional skills and knowledge. In RAY HUB transversal competences play an essential role: for the future employee who are supposed to change their jobs several times, they will consequently also need a constant gaining of new professional knowledge and skills – life-long training. But, the transversal competences will be an accompanying partner for every job, thus they are a must be element in the package of students'/apprentices' work-based learning experience.

Here are listed some of the transversal competences the student/apprentice can gain through RAY HUB:

- Agility
- People management
- Cognitive flexibility, ready to change
- Innovative in creative thinking
- Complex problem solving
- Critical thinking
- Judgement and decision making
- Communication
- Teamwork
- Coaching
- Promoting oneself
- Emotional intelligence
- Negotiation
- CV and motivation letter writing (mother tongue and English)
- Preparing interesting and problem solving-powerful presentations of hands on projects
- Self-promoting and presenting
- English expressions of products

*See definitions of transversal competences examples in Appendix 1

3. RAY HUB – a puzzle of work-based learning activities

The more puzzles you put together, the more you are creating the image of the whole- the more models you put together and experience them, the more active and richly you design your own professional and personal character - that is the focus of RAY HUB.

A student/apprentice can choose as many “work-based learning/WBL activities” as he/she wants but at least one activity, such as: hands on project, job shadowing, business trip, international virtual campuses, international exchange, apprenticeship, internship etc. (image page 10 or more activities page 4-8).

Additionally, new models can be developed. It is suggested that in the first years the student uses more simple models such as: job shadowing, industry field trip etc. and that the level of difficulty of the models accelerates with the years of the student. Implementation of individual WBL models, as well as development of new WBL models inside RAY HUB model depends on innovative and creative approach of individual student; his/her motivation to implement it; on individual employer willingness or ability to organize it and invest in it with staff, time and money; on offering a good, supportive and motivated tutor and in-company trainer; on working as a team (student/s – tutor – in-company trainer).

*See example of key elements for hands on project or other practical activities inside the RAY HUB model in Appendix 2

4. Project based approach

because project is a unique venture involving uncertainties which are to be managed during execution. Project-based learning is capable to meet the challenges of preparing students/apprentices to solve the real-world problems. Project-based learning is better than traditional learning.

We need to prepare the new generations for the future and everchanging jobs. Traditional learning or work-based learning models are being challenged by the ever-increasing complexity in our lives, societies and working places. Project-based learning focuses on developing critical thinking and problem-solving skills in the students. Its inquiry-based method of learning to solve the problems given as projects to the students is a style of active learning. It integrates “knowing and doing” when student apply what they know to solve authentic problems with intentions to produce results that matter.

A project has scope of work, resource, and planning activity to execute and manage resources to get the desired results. In the present world of full of ever-increasing complexity, project-based learning is preparing students to solve the real-world problems.

*See RAY HUB - benefits of ”project-based learning approach” in Appendix 3

5. Tutoring

The RAY HUB supports the student/apprentice in two person-roles: the tutor (VET teacher from the VET school) and the in-company trainer (mentor from the company). They both execute the tutoring for the student/apprentice.

Tutor and in-company trainer must both play the supportive role to the students with the constant exchange of views, knowledge, skills, attitudes etc. They support and follow the student in his/her professional progress as well as in personal development. They must act user oriented: strong consideration of individual student specifics, interests, needs.

The main point in tutoring is the relationship. The aim is to establish such relationship in which all main included actors will benefit.

The tutor/the in-company trainer must build his/her relationship with the student on mutual respect and trust, considering the specifics of individual student. It is not only the matter of professional support but acting as a pedagogue.

Important issues in RAY HUB tutoring

“Student - VET teacher - in-company trainer” relation builds on:

- getting to know each other
- getting to know the options
- face to face relationship
- digital tools and resources as an important support (for communication, WBL activities tasks etc.)

The main activity in tutoring is to support the student in his/her personal and professional development.

Tutor and in-company trainer stimulate, motivate and encourage the student to learn and act by using the following characteristics:

- Teamwork
- Responsibility
- Sharing
- Empathy
- Mutual respect
- mutual search and exchange of knowledge, experience, perspective
- Support/collegiality
- Self-initiative
- Problem solving
- Critical thinking
- Agility

Through regular contact and establishment of a supportive relationship, tutor and in-company trainer maintain an overview of the student’s personal and professional progress and development, building self-confidence, as well as an overview of the student’s wellbeing.



Tutor and in-company trainer signpost the student toward:

- Appropriate sources of support where necessary,
- development opportunities,
- opportunities to evaluate the progress, both in terms of professional and personal progress, which include also experience gained through partially completing or not completing the WBL activity(hands on project)

Some examples of concrete actions in tutoring:

- Weekly face to face contact, e-mail, messenger, phone or similar (as defined at the beginning - in a special agreement) (tutor and in-company trainer)
- Supports the student in preparing: individual plan or »student's RAY HUB journey« (tutor and in-company trainer)
- When student in the company, visits him/her weekly (tutor)
- Establishes the contact and relation with the in-company trainer and keeps regular contact with him/her, exchanges knowledge and experiences on the professional field of the project (tutor)
- Seeks constantly for good practices relevant to the individual hands on project or other RAY HUB WBL practical activities, especially those connected with technological, societal and ecological advancement (tutor and in-company trainer)
- Evaluates the student's progress together with the student and in-company trainer and suggests improvements (personal, professional, general) (tutor)
- Etc.

The tutoring can involve individual or group tutoring.

*See more about tutoring in group tutorial in appendix 4

Digital support and communication

Through RAY HUB the tutor and in-company trainer stimulate students to use digital tools and social media for the work-based learning process, communication and teamwork in order to use all benefits of the digital environment and make the learning process, communication and teamwork more efficient and transparent. There are plenty of possibilities for using various already existing digital tools and platforms. The important issue is that the tutor and in-company trainer show the student the useful and valuable benefits of using those tools and platforms and teach the students how to use and value the contents of the platforms critically. It is also highly recommended to create new digital contents and establish own digital library with own created digital contents or good example cases (e.g. video tutorials, podcasts etc.) sorted according to the specific topics dealt with inside the individual RAY HUB work-based learning process. The most successful and efficient way for using communication and teamwork digital tool is to use the tool which is already used by students and not recommended by the tutor or in-company trainer.

Assesment, non-formal validation

When assessing student's work the tutor and in-company trainer assess not only gaining new professional skills but also developing transversal skills and the knowledge the student has achieved in a non-formal or informal way, which is needed and used in the RAY HUB activities.

Most of the students today gain a lot of knowledge and skills through non-formal and informal learning. E.g. Each student spends many hours on the internet and learns things on purpose or mostly subconsciously. Enormous number of data is gained in that way and transformed into a specific knowledge the student can use as a skill in RAY HUB experience.

It is useless to deliver already gained knowledge again at school, but teach the student to critically value the data, give them the opportunity to test this knowledge in practical experience, validate and recognize as learning outcome.

The time usually spent for »lecturing about certain topics« the student had already learned about online, the tutor/teacher can spend for critical valuing or explanation instead.

All the non- and informal gained knowledge happen to play more and more important role in the business world. For this reason the non- and informal gained knowledge need to get adequate value during educational process. The process of recognition must be a simple one. The efficiency lies in simplicity.

Teacher upskilling or VET teacher-tutor/in-company trainer collaboration

Through RAY HUB VET teacher as a tutor to student or to team of students needs to have regular contacts with company trainers. Through these contacts the tutor can establish successful and very useful relationship to company trainer and other experts that can turn into a sustainable collaboration. This collaboration can have both-sided benefits and can result in arranging many collaborative activities such as:

- upskilling in companies for VET teacher/tutor in a specific professional topic dealt with in individual RAY HUB experience
- VET teacher making regular visits and lectures with students in companies
- Job shadowing for VET teachers in companies
- Regular contact with companies – exchange of competences needed for future and can further deliver them to students (knowledge flows instead of knowledge stocks)
- Designing a common curriculum (tutor + trainer) that can be implemented at the company place or school labs.

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Appendix

Appendix 1

Definitions of transversal competences examples:

- **Learn with fun:** Creative classrooms give an opportunity for students to learn with fun. The teaching activities such as storytelling and skits help them to learn without the pressure of learning. Students are always fun loving and including creative activities along with curriculum gains their interest for learning. Teachers should encourage this quality in students from the lower classes itself and inspire them to believe in one's own creativity. Fun team building activities can be organized so as to promote creative thinking in groups and helping them to learn about accepting others' ideas.
- **Freedom of expression:** Unlike the conventional teaching methods, the creative classrooms give them the opportunity to express themselves. Whether it is debate or classroom discussions or field trips, students have the chance to come out of their shells and become a part of it. This freedom of expression gives them a sense of goodness and happiness. Making some contributions in the learning sessions gives them a sense of satisfaction too. A creative approach to learning makes them more open with the puzzles that come their way and gives them a feeling of accomplishment and pride.
- **Emotional development:** Creative expression is important for a kid to trigger up their emotional development. Importantly, this has to happen at their lower classes itself so that they grow up by responding well to the happenings around them. Creativity gives them that freedom to explore the surroundings and learn new things from them. Students would always love a classroom setting that helps them to explore freely without setting them any boundaries. When they can show off their true emotions in a creative manner in their classrooms, they can build up good confidence level.
- **Enhances thinking capability:** Creativity can stimulate imaginative thinking capability in students. That is why teachers promote activities such as open-ended questions, creative team building activities, brainstorming sessions and debates amidst busy curriculum schedules. Some teachers tactfully use these techniques to teach tough lessons to make children learn with fun and ease. Activities such as puppet shows will keep the students feel interested in the learning sessions and the flow of images in their mind gives them the pleasure of creativity. The open-ended questions will open them a world of imaginative thinking and they can come up with creative responses.
- **Reduced stress and anxiety:** When some time is set aside for creativity in between all the strenuous study times, it takes a lot of stress away from students. This sense of joy keeps them relaxed and reduces their anxiety which in turn helps them to prepare well for exams and excel in it. Integrating more hands-on learning and making room for visual reflection is really going to make a positive impact. Encouraging productive discussions as well as making the classroom layout more flexible all matters a lot in gearing up a creative classroom atmosphere.

- **Boosts problem solving skills:** The brain storming activities involving puzzles can stimulate the skills of problem solving in children. Creativity can really alter the way students approach a problem and it can be impressively optimistic once they go through creative teaching sessions. Creative problem solving can be encouraged in classrooms that help students to think out of the box and be more imaginative and innovative. With this way, the problems or opportunities are redefined by the students and the solutions or responses would be more innovative.
- **Improves focus and attention:** The average attention or concentration span of a lower-class kid is just a few minutes. The conventional teaching methods would be boring for them and they may lose their focus in the midway. Including creative teaching strategies such as storytelling and skits are sure to improve their focus and attention and the study time would be more productive. Playing memory games, taking regular breaks and intervals to bring in some creativity and setting a flexible classroom environment can make a lot of improvement in their attention span.
- **Better communicators:** A classroom environment that promotes creativity opens them a world of communication. Students can make better conversation and stimulate innovative thinking and talking sessions in their free time. This also triggers group problem solving and shared learning that gives them a feeling of togetherness. Classroom debates not only help them to think creatively but also understand and welcome others' views. This kind of shared creative experience helps them to open up to one another and grow up as better communicators.
- **Follow passions:** Working out the passions in addition to excelling in the academics is important for a student to come up successful in life. A good classroom environment should give space for students to follow their passions whether it is music, dance, poetry, drawing or other art forms. This gives students a sense of happiness which in turn helps them to approach academics with a free mind. Setting aside time for such activities is really going to help them develop their creative talents in addition to academic brilliance. Students who rightly use these opportunities can come out of the school with flying colours.
- **Future opportunities:** A stimulating classroom can have charts that visualize the goals with timelines that helps students to have a look on the go. The classrooms are the place where students get the basement for how successful they can be when they grow up. The skills and the confidence they gain throughout their school days are really going to make an impact in the way they prosper the career. In fact, creative persons have an upper hand in triggering future opportunities than those with a mere academic skill set. They can express freely during knock out rounds and the way they present themselves really matters in this competitive phase.
- **Innovative mindset:** Open ended questions and classroom discussions are two popular creative teaching strategies that help students to develop an innovative mindset. Students get opportunity to think more critically about the question or subject and come up with innovative ideas. The friendly classroom discussions also aid them to think decisively about others' ideas and contributions while thinking critically to produce something innovative. A stimulating classroom setting which is colorful rather than black and white can do the trick to lower class students and teachers can make some effort to bring in some humor between the lessons.

- **Drive lifelong learning:** A person with a creative mindset always has that craving to learn new things every time and this helps them to have that amazing feeling of lifelong learning. This would really keep them engaged and active throughout which in turn helps them to stay young always. A curious mind always loves to learn more and the creative classrooms can build up a curious mindset in children through unconventional ways. The education APPs are on the rise with the growing mobile market and there are some awesome APPs such as Doodle Buddy, 123D Sculpt, Audacity and GarageBand that gear up creativity.

However, it is the role of a good teacher to bring in the right mix of creativity in classrooms and bring out the best in the students. The pleasure of creativity also contributes a lot to improved health and this helps them to have a continued growth in academics as well as world of creativity. During a TED talk, Sir Ken Robinson raised the utmost significance of creativity in today's education when he told "Creativity now is as important in education as literacy, and we should treat it with the same status." Every child has some inbuilt creativity in them and proper guidance from the teacher coaxes and cultivates it to help them grow up as creative individuals.

A good educational environment always has some elements of creativity which makes the education & training more interesting and interactive. The right mix of creativity along with curriculum helps students to be innovative and also encourages them to learn new things. Students can grow up as good communicators in addition to improving their emotional and social skills. Creative processes can really transform the way students acquire education and how they apply it in their real life. In fact, creative expression plays a key role in a student's emotional, as well as professional development.

Appendix 2

Example key elements for hands on project or other WBL practical activities inside the RAY HUB

The RAY HUB model consists of the must be elements, which are as follows:

1. Title of the project
2. Grade of students, programme
3. Number of team members
4. Duration of the project (hours)
5. Number of employers wanted
6. Brief project summary
7. Categories/professional fields of industry and services
8. Project:
 - ▶ What brings the student in
 - ▶ Project description
 - ▶ Outcomes:
 - Phase 1: project plan
 - Phase 2: project execution
 - Phase 3: report and presentation
 - ▶ Milestones
 - ▶ Skills gained (professional and key competences), network established
9. Name of the tutor, his/her references and name of the trainer, his/her references

10. Start, end date

11. Organisation commitments:

▶ Communication

▶ Tutoring (hours) and coaching

Establishing student's profile

Appendix 3

RAY HUB - benefits of “project- based learning approach”

1. Scope of work

Students learn to comprehend the entire scope of the project and put the execution into a structure under guidance of their tutors or in-company trainers.

2. Real world problem simulation

Project-based learning focuses on enabling student to face real world situations simulated in the forms of the projects. Students learn while doing what they know and develop new learning around hobbies, passions, and careers. They often develop new hobbies, passions, and liking for new careers.

3. Improves the interpersonal skills of a student

Students need to structure their efforts in organizing their survey required for the projects, analyze the survey results, and prepare reports to reach markets and collaborates with sponsors/employers of the projects. In the entire approach or different stages of the project they improve their communication skills to collaborate with various VET stakeholders.

4. Concept and creativity development

Real world situations given in the project are more capable to draw students' attention and capture their interest to provoke the needed level of thinking to apply new knowledge in a problem-solving context.

5. Determines the actual knowledge

It determines in depth knowledge and experience of the students and even of tutors and in-company trainers.

6. Choice of selecting real world problems

Projects are chosen by the students or assigned by the tutors/ in-company trainers according to the students' interest. Students are presented to have choice based on their interest in selecting a real- world problem presented in the project. Interest-based selection of projects gives student unique ways of solving different problems. Motivation is the highest when the student proposes his/her own hands on project.

7. New style assessment of students' skills

Tutors and in-company trainers are able to assess students' capabilities to observe, survey, and investigate, then allocate the projects determining the activities and events based on their interest. Students find themselves capable of honing their observation and analyzing skills. Tutors and in-company trainers can directly assess the development of these skills among their students when they perform activities of the project work.

8. Visits to field-sites of real-world problems and working at employers' place

A significant feature of project-based learning is field-site visits by the students, tutors and working at employers' place, and vice versa in-company trainers at school place, as needed in the project executions which open new ways of learning and collaborating with VET stakeholders and new people.

9. Direct demonstration of the capability

Tutors and in-company trainers get greater opportunity to assess their students' capabilities demonstrated in the performing activities and events organized in the projects.

10. Tracking of progress

In project-based learning tutors/in-company trainers and students both, since they work in a team, can track their activities involved to solve real world problems.

11. End-to-end problem-solving skills

In project-based learning students undergo various stages of problem solving through structure of the project which include various stages like project scoping, work planning, activity performing and tracking, managing uncertainties presented during problem solving activities of the project, presentation of the project, and closure. Students have opportunities to develop skills of observation, survey, research, reporting, presentation, communication, and collaboration with people involved, team building, and leadership in the end-to-end problem-solving approach of project-based learning.



Appendix 4

Tutoring in group tutorial

The tutor uses group tutorials in several ways. On one hand, the group tutorial allows the tutor to deal with greater numbers. By bringing the students together the tutor can avoid having to schedule many individual tutorials, which takes up more time and energy. Group tutorials are an excellent opportunity for students to share ideas, references and techniques and practice their presentational skills. In addition, they can also help students to 'benchmark' their own progress against that of their peers. It is a very useful method of keeping everyone motivated. It is also a way of reinforcing the standards of excellence at VET colleges.

The tutor can use group workshops/tutorials with a practical, hands-on approach (doing something yourself rather than just talking about it or telling other people to do it).

The tutor must be aware of balancing the input of naturally dominant individuals with those of the more reticent students who do not want to speak. One way to achieve this is ask each student a question in turn. This can make the whole process mechanical. The questions are related to WBL progress (professional and personal development), but can also improve discussions by employing open questions, such as "Have you got any suggestions for ways to take this particular idea forward?" or "Could anyone suggest different ways to produce this work".

The tutor (in this case VET teacher or in-company trainer or career counselor) tend to view the tutoring mainly as host and facilitator. Often this begins with introducing the programme or theme for discussion, introducing the participants if they are unfamiliar with each other and laying down ground rules and parameters for debate. The tutor may launch key questions and volunteer personal insights and opinions to promote early reactions and responses. Throughout the process the tutor uses his/her experience in order to tease out areas of interest, to encourage contributions from individuals the tutor feels have a connection to particular points in the discussion and generally direct and steer the situation in order that it retains fluid, active and crucially, useful. This can involve the use of several approaches.

Students may variously need encouragement, or challenging. The conversations may need redirecting to more in-depth, valid or serious subjects. It can prove useful to place students in oppositional debate in order to extend dialogue. Occasionally the discussion may necessitate a degree of refereeing in order to accommodate rival factions and diverse intellectual positions. The tutor may supply context to an idea or theme in support of a notion offered by a student or offer an extended interpretation of a matter that has arisen. In addition, the tutor can invite participation from students who have contributed the least. By doing so the tutor can ensure that everyone is participating fairly and fully, and hope that by doing so others learn by association to do the same.

Where the group tutorials were already used, it was proved, that one of the key measures of success in group tutorials is the extent to which the tutor can afford to sit back and let the students do the work. The tutors have often got the impression that the students have learnt more from each other than from the tutor which is just fine. Their independence (of students), and the sense of pride and ownership they have in their work and their discipline, is a great thing. To witness this is fantastic fuel for a tutor.

Colophon

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Design and layout: Teja Žižmond

Language: English

URL: <https://ray.scng.si/files/2017/12/RAY-HUB-model.pdf>

Format: pdf

Publication Date: October, 2019

“The European Commission’s support for the production of this publication does not constitute an endorsement of the contents, which reflect the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.”