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WP2: Methodological Framework Definition

Activity 2.2: Analysis of key Methodologies

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Executive Summary

The aim of the EthAI Tour project is not only to develop and provide an extensive vocational training material tailored to the necessities of the labor market for the purpose of digitizing the tourism sector and to promote the ethical and trustworthy use of AI to both VET trainers and trainees, but also to contribute to the development of the European Commission's (EC) evolving mandates that encompass the Ethics Guidelines for Trustworthy AI, Europe's Digital Decade, the EU Pact for Skills and the Transition Pathways for Tourism. In this way, the consortium is targeting the horizontal priority: Addressing digital transformation through the development of digital readiness, resilience and capacity and the sectoral priorities: VET: Increasing the flexibility of opportunities in vocational education and training and VET: Adapting vocational education and training to labor market needs.

This report is part of the work conducted in Work Package 2 “Methodological Framework Definition” and specifically of Activity 2 “Analysis of key Methodologies” led by Travel2Fit. The main goal of the activity is to have an internal assessment with regards to key lean and agile approaches as well as quality assurance methodologies applied in industry or other business sectors, in order to evaluate which parts of them are more appropriate and easily transferable for the creation of the most suited EthAI Tour framework to serve the project needs.

Positioning of the report in the context of the EthAI Tour project

In the context of the EthAI Tour project, the present report is positioned as follows:

- It presents the findings of WP2/Activity 2.
- It serves as input and directly contributes to the realization of the WP2/Activity 3 “Methodological Framework” led by ATLANTIS.
- It constitutes part of the Work Packages outputs which will be presented in the 1st Multiplier event.

Description of the report

This report analyses the findings of the work conducted by consortium partners for the identification, internal assessment and elaboration of key lean and agile approaches, as well as quality assurance methodologies, which are applied both in VET programs and in the industry or other business sectors and are considered relevant for the development of the EthAI Tour methodological framework.

1. Introduction

The tourism sector was already under fundamental transformations including digitization, automation and personalization of services, when the Covid19 pandemic occurred, further forwarding the use of AI tools for the enhancement of efficiency in the tourism sector and customer experience.¹ This rapid proliferation of AI-powered methods and services together with the advantages and assets of its use generated critical ethical issues concerning the loss of privacy and security, bias and fairness, transparency and explainability, the impact on jobs and labor. It's becoming increasingly clear that while the use of AI has the potential to revolutionize the tourism sector, its ethical implications, risks and unintended consequences need to be addressed, as they affect negatively travelers, the society and even the environment.

However, the tourism personnel seems to lack the appropriate and needed training regarding the deriving ethical concerns from the expansion of AI usage. It is noteworthy that according to the EU's 'Pact for Skills for Tourism', up to 25% of the industry's workforce maintains low-level related qualifications, while only 30% of the hospitality businesses could be regarded as digitally transformed.²

In the light of these transitions and targeting the EU's Digital Decade program goal to reach the 80% of all adults skilled to use technology for their daily duties and the 75 % of businesses ability to use Cloud, AI and Big Data by 2030, the need for new VET offerings, ensuring the industry's growth are imperative.³

The EthAI Tour project envisions and aims for the development of an innovative training framework for tourism VETs so as to provide them with the necessary skills and competences when deploying AI-based tools and methods from a more ethical guided point of view. Its objective is not only to foster innovation in the European VET system, but also to enhance the digital and ethical data-driven alterations of the sector and equip its workforce in order to abide by the industry's and the EU's demands.

The first logical step towards this direction is the identification, internal assessment and analysis of key lean and agile approaches, along with quality assurance methodologies currently applied by consortium partners (serving as baseline). These methodologies are considered relevant for the final definition and formation of the EthAI Tour methodological framework. A similar method is also followed for the identification of other methodologies followed in industrial and business sectors, to evaluate which parts of them are more appropriate and easily transferable for the design and creation of the project's most suited framework to serve its needs.

The report is structured as follows:

- Section 1 is serving as the introductory section of the report presenting general information and offering the overall positioning of the report.
- Section 2 concerns the methodology followed for implementing the tasks associated with Work Package 2.

¹ https://ec.europa.eu/growth/sectors/tourism/support-business/digital_en

² <https://ec.europa.eu/social/main.jsp?catId=1517&langId=en>

³ https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age/europes-digital-decade-digital-targets-2030_en

- Section 3 is describing a wide set of methodologies (both baseline methodologies and other methodologies from EU industry and business sectors) that would be considered within the project.
- Section 4 concludes the report.

2. Methodology

The methodology underpinning the activities of Work Package 2 “Methodological Framework Definition” is graphically presented in the following figure.

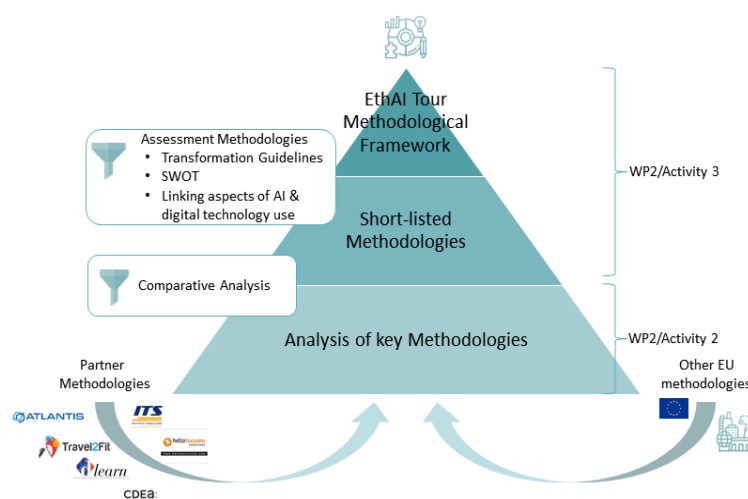


Figure 1: Work Package 2 Methodology

WP2/Activity 2 aimed towards the following:

- To identify key lean and agile approaches or quality assurance methodologies that are currently used by consortium partners, either in E&T frameworks or in their daily activities.
- To acknowledge and distinguish other methodologies, applied in EU industrial or business sectors that could be transferable in the context of the EthAI Tour project.

The primary goal is to build an overarching view of existing methodologies and select the most fitting and relevant ones to serve project needs. For this, a dedicated spreadsheet was created to facilitate partner reporting.

Moving forward and as a preparatory step for WP2/Activity 3, the Methodological Framework, an internal comparative analysis is planned at the identified list of

methodologies, as a first filtering mechanism in order to single out the most convenient and proper methodologies to fulfill the project's objectives. Following, the short-listed methodologies will be further analyzed properly in order to constitute the basis for the development of the EthAI Tour methodological framework for the lean, agile and easily readaptable delivery of VET. This last step will include:

- A guideline describing the adaptive transformation of the various methodologies for the field of VET with focus on the specialties of the reconfiguration topic
- Performing assessment methodologies like SWOT analysis.

3. SoA of Applicable Methodologies & Innovation Management

In the following sections a selection of lean and agile approaches and quality assurance methodologies is analyzed, with characteristics that have been identified by consortium partners as intriguing for expanding the VET offering and centering the focus on the ethical implications of the use of AI tools and services.

3.1 Baseline Methodologies & Other Methodologies from EU Industry & business sectors

Baseline methodologies refer to methodologies that are already exploited by consortium partners and could be reconfigured in a way that addresses the project needs, while the ones identified in EU industrial & business environments, present interesting aspects that could be of added value to the proposed EthAI Tour methodological framework.

Lean Methodology

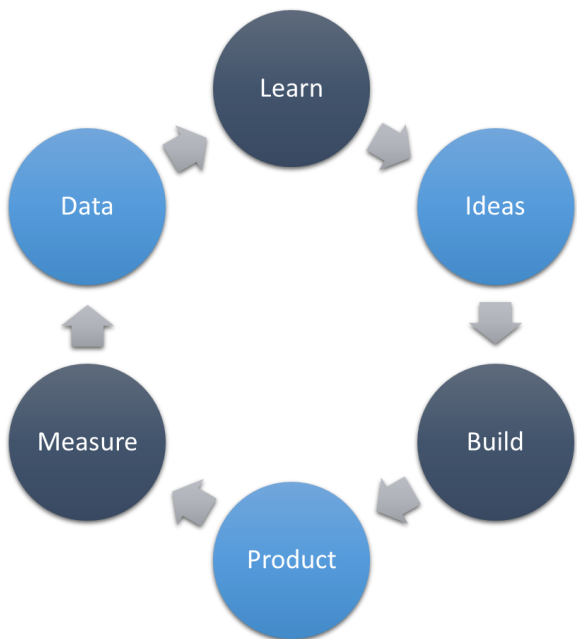
Id	1
Name	Lean Methodology
Description	Lean refers to a methodological framework firstly introduced into the world of manufacturing (Toyota Motor Corporation case), to address the needs that derived from the 2nd World War manufacturing crisis ⁴ . The outcomes of this approach in manufacturing were quite promising and as such, Lean thinking was firmly introduced in other sectors, including the service sector with its own specific attributes. Lean aims to provide cost-effective, high-quality results through continuous process improvements. As it is a business-based philosophy it focuses on the empowerment of the productivity of the Lean organizations via customer-centric process analysis. Lean's focal point is that all processes within a business should contribute in adding value to the end product, as value is defined by the customer and from a customer's point of view, added value is perceived in the context of the willingness to pay for the

⁴ Ohno, T. Toyota Production System: Beyond Large-Scale Production; Productivity Press: Cambridge, MA, USA, 1988

	realization of specific product requirements. In case any step within the process doesn't contribute to this goal it is called waste and should be minimized to the maximum extend. Taking into consideration the above-mentioned critical elements, literature regards the following steps as vital for applying Lean thinking: • Identification of the waste sources, meaning processes and product features that don't add value, as perceived by the customer • Minimization of the non-value-added activities • Continuous emphasis and attention to the waste identification - minimization approach and the reinforcement of a Lean culture within the business/organization During the waste identification step, the following sources are perceived as most common⁵: • Overproduction • Inventory • Overprocess • Defects • Transportation • Motion • Waiting • Unused creativity In the world of startup businesses, the Lean methodology is a remarkably common framework as it focuses on the needs of new entities to adapt and adjust depending on customer and macro-environmental requirements. Initially, problem identification gears up the lean framework. Then the startup needs to conduct a Minimum Viable Product (MVP) which is constituted of the smallest form of the product allowing the startup to carry out a hypothesis testing. Following, the Hypothesis testing, gives the team the opportunity to validate the product in the market and either sustain or alterate their business model. With these small repetitive cycles of learn, build, measure, the startup can considerably alleviate the risks of failure which in the startup world is a decisive factor. 'Lean startup redefines a startup as an organization that is searching for a scalable business model, not one that has an existing business plan that it is determined to execute'⁶.
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⁵ Hines, P.; Taylor, D. Going Lean; Lean Enterprise Research Centre Cardiff Business School: Cardiff, UK, 2000; pp. 3–43.

⁶ Eisenmann, Thomas R., Eric Ries, and Sarah Dillard. "Hypothesis-driven entrepreneurship: The lean startup." *Harvard Business School Entrepreneurial Management Case* 812-095 (2012).

	 Figure 2: The Learn-Build-Measure cycle of the Lean framework
Key Characteristics in Education	In education⁷, Lean can be considered as a philosophy intending to provide a new way of thinking of how the education processes should be reorganized so as to provide equal or added value while eliminating certain factors that are not capable of contributing to the education process. Taking into consideration this aspect, two different perspectives should be highlighted⁸: 1. Lean Education deals with all stages of the educational system, aiming attention to the facilitation of the organization's transition into a lean organization. In lean education some elements aspects might seem puzzling due to the fact that products and customers are different and examined in various cases (i.e. in private schools, the degrees are the products and the students are the customers, while in public schools the graduates/students are the products and the state is the customer). 2. Lean Teaching is coping with techniques and approaches that intend to bring lean philosophy into the classroom (e.g. the process of knowledge sharing from the teacher to the students for improving their skills and competences). Considering this aspect, students can be considered as the

⁷ Martínez Sanahuja, Silvia. "Towards lean teaching: non-value-added issues in education." *Education Sciences* 10.6 (2020): 160.

⁸ Martinez, S. Lean Teaching: A New Trend in Education. In *Didactics of Mathematics: New Trends and Experience*, 1st ed.; Magreñán, A., Ed.; Nova Sciences: New York, NY, USA, 2020

	customers of the learning product. Generally, Lean Teaching is quite often regarded as a building block of Lean Education ⁹ .
How are the results measured	By measuring the wastes. The determination of the amount of non-value-added activities constitutes an indicator of advancement.
Market or applications being used most commonly	Manufacturing, Engineering, Software development, Startups
Gaps within the subsequent methodology / Issues to be considered	Education & Training depend on a complex variety of processes. Many stakeholders are hesitant concerning the use of a methodology generated in manufacturing world into education. Strong leadership, culture and training is necessary.
Relevance to the project / Strong points to be consider	Lean methodology is a framework that can be applied in Education and its opportunities can be mapped by teachers and students. Constant improvement of the cycles of Build-Measure-Learn might be needed and the results could be evaluated providing its benefits to the Educational environment.

Competency Based Learning

Id	2
Name	Competency Based Learning
Description	In general, competence-based approaches aim to enhance the work-life relevance of education to the meet needs of the labour market and societal development. ¹⁰ It is an approach to education that focuses on the student's demonstration of desired learning outcomes as central to the learning process.
Key Characteristics	A key characteristic of this type of learning is its focus on skills, mastery and competences. Despite the fact that in other learning

⁹ Emiliani, B. Lean University: A Guide to Renewal and Prosperity; The CLBM: Wethersfield, CT, USA, 2015

¹⁰ <https://www.emerald.com/insight/content/doi/10.1108/ET-07-2020-0216/full/pdf>

in Education	models, the necessary content of skills or concept is presented to students gradually and the success is aggregated, in a competency-based learning system, learners are not allowed to continue until they have demonstrated mastery of the identified competencies (i.e., the desired learning outcomes to be demonstrated). ¹¹ Except from the fact that this method is learner-centric, the concept of competency-based learning always focuses on clearly defined learning outcomes and thus, competency-based learning could be considered as a form of outcomes-based learning.
How are the results measured	Learners, at this phase, evaluate themselves and assess their improvement. Following, a preferably self-directed, based on the personalized knowledge they hold, progress and improvement have to take place. Then, their success can be measured with the use of a competency based assessment tool, either a software tool, or a written, paper based process for the assessment of the learner's level of competence and the identification of possible improvement needs.
Market or applications being used most commonly	Education
Gaps within the subsequent methodology / Issues to be considered	In a system with diverse methods, strong assessment forms and certain, manageable learning outcomes that are available and accessible to all trainees, competency-based learning could prove to be an effective method, that could lower incompetence and at the same time boost the pedagogical accuracy and the learners' accomplishments. Encompassed by its benefits, trainees with different knowledge backgrounds and literacy levels, are given the flexibility the opportunity to continue their learning path at their own pace. Nevertheless, this approach could prove to be difficult in terms of acknowledgement and assessment of the most critical competencies that could be supportive to the learners.
Relevance to the project / Strong points to be consider	The Competency Based Learning methodology enables learners with work or family time restrictions, to study at their own personal pace and therefore, it could considered to be an appropriate educational method for the EthAI Tour project.

¹¹ <https://elearningindustry.com/key-concepts-of-competency-based-learning>

Design Thinking

Id	3
Name	Design Thinking
Description	Design thinking is a human-centered approach to innovation (innovation management approach) — established for understanding the customer's needs, rapid prototyping and setting up creative ideas—that could revolutionize the way products, services, processes, and organizations are developed. ¹² When applying design thinking, decisions are formed and taken according to the customers actual needs instead of relying only on historical data or making risky bets based on instinct instead of evidence. ¹³
Key Characteristics in Education	Design thinking inspires learners to navigate and explore, think outside of the box and start being reflexive. Moreover, it is highly collaborative and adjustable and can be easily adapted with other methodologies.
How are the results measured	A measurement framework is based on the following criteria ¹⁴ : • Customer feedback – their feedback after the use of the product or service affects and influences the level of satisfaction based on their testimonials • Related activities – the amount of processes exploited, as well as the number of the participants in them • “Immediate” results – the number of implemented projects based on design thinking sessions • Traditional KPIs – such as financial performance, market success, and revenue outcome of design thinking projects • Reflective Measurements – questionnaires and surveys conducted internally and externally by participants in design thinking processes • Working culture – the impact of the design thinking inside the working environment could be measured under motivation,

¹² <https://online.hbs.edu/blog/post/what-is-design-thinking>

¹³ Razzouk, Rim & Shute, Valerie. (2012). What Is Design Thinking and Why Is It Important?. Review of Educational Research. 82. 330-348. 10.3102/0034654312457429.

¹⁴ https://doi.org/10.1007/978-3-319-19641-1_11

	team collaboration and engagement aspects
Market or applications being used most commonly	Business, Education, Computer Science
Gaps within the subsequent methodology / Issues to be considered	Integration of sustainability approaches in the process
Relevance to the project / Strong points to be consider	This methodology creates a needs-based, user-centered approach to learning.

Total Productive Maintenance

Id	4
Name	Total Productive Maintenance ¹⁵ (TPM)
Description	By forming a productive team with no gaps or overlaps, TPM pillars offer the structure to define and enhance everyone's job, from top management to shop floor employees. Everyone is aware of what must be done and how to accomplish it correctly the first time. By enhancing the competencies of its staff members and maximizing their capacity for productivity, education advances. Building a business organization and culture that continuously adapts to changes in the economic climate, technological advancements, the introduction of more complex machinery, and the development of more modern management techniques is the goal of a TPM program.
Key Characteristics	Soft skills training: Communication skills, diversity training, and teamwork training.

¹⁵ https://en.wikipedia.org/wiki/Total_productive_maintenance

in Education	• Technical training: Upgrading problem solving and equipment related skills. • The goal of training and education is to develop suitable and efficient training methods, provide the necessary training infrastructure, and disseminate information about the other TPM pillars
How are the results measured	• Reports • Essays • Research projects • Case study analysis
Market or applications being used most commonly	Industries, Training and Education, Safety, Health, Environment, Administration
Gaps within the subsequent methodology / Issues to be considered	-
Relevance to the project / Strong points to be consider	By enhancing the competencies and productivity of their staff, educational institutions advance. Building a business organization and culture that continually adapts to changes in the economic climate, technological advancements, the introduction of more complex machinery, and the creation of more modern management techniques is the goal of a TPM program.

Total Quality Management

Id	5
Name	Total Quality Management
Description	Total Quality Management (TQM) is an efficient and methodical management approach aiming for continuing success via customer satisfaction. This could be secured through the commitment of all organization members to participate in the continuous improvement

	of processes, products, services and their general culture¹⁶. Despite the fact that TQM was successfully implemented in the manufacturing sector, it quickly drew the attention and interest of academia to adopt the best practices of TQM in other sectors, including tourism¹⁷. With the TQM application of strategic planning, data and communication mechanisms and the integration of quality aspects into the organization, the general culture of the organization is effectively shaped according to 8 principles listed below: • <u>Communication</u> - Effective communication mechanisms are employed not only in case of organizational changes, but also within day-to-day activities. • <u>Process Centered</u> - It is considered a vital part of TQM, as the detection of unpredicted outcomes can be safeguarded by the monitoring of inputs, outputs and KPIs of a process and the precise definition of steps to be considered. • <u>Focus on Customer</u> - This principle determines the quality level and the efficiency of the actions. • <u>Employee commitment</u> - The key concept of the overall commitment of the employees to a common vision includes self-managed teams and other empowerment measures such as elimination of fear from work environments. • <u>Strategic and Systematic approach</u> - Quality is an integral part of strategic planning or strategic management in order to achieve the organization's vision, mission, and goals. • <u>Integrated System</u> - Even if an organization could be segmented into many departments, in the case of TQM it's the horizontal unification of these departments that is important. • <u>Decision-making based on Facts</u> - Constant monitoring and analysis of performance is recommended so as to achieve consensus and drive the improvements based on facts, as data-driven decision making is a focal point for TQM. • <u>Continuous Improvement</u> - Each organization seeks and is need of continuous improvement, in order to deal with the differentiation of stakeholder needs and to secure a competitive advantage.
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¹⁶ Deming, W.E. (1986) Out of the Crisis, MIT Centre for Advanced Engineering Study, Cambridge, MA

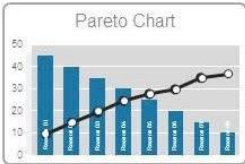
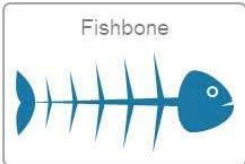
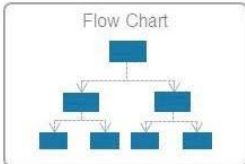
¹⁷ Farrington, T., Antony, J. and O'Gorman, K.D. (2018) 'Continuous improvement methodologies and practices in hospitality and tourism', International Journal of Contemporary Hospitality Management, Vol. 30, No. 1, pp.581–600.

	 Figure 3:Total Quality Management Principles
Key Characteristics in Education	TQM in education is characterized as a management approach which keeps in the spotlight quality aspects. TQM has been introduced in primary, secondary¹⁸¹⁹ and higher Education²⁰, including the achievement of high quality educational processes. However, the introduction of TQM in educational organizations is in need of numerous alterations, such as the management's and educators' perspective and actions, the coordination and close observation of the educational process, or the assessment of its outcomes, the general atmosphere of the organization and also the social relations.
How are the results measured	TQM utilizes the following Quality Improvement (QI) tools: • Cause –and –Effect diagrams (Fishbone diagrams) • Pareto Charts • Data Collection through Check Sheets (Process Maps, Data gathering tools), Stratification of data

¹⁸ Sfakianaki, E. (2019) 'A measurement instrument for implementing total quality management in Greek primary and secondary education', *International Journal of Educational Management*, Vol. 33, No. 5, pp.1065–1081.

¹⁹ Kaiseroglou, Nikolaos, and Eleni Sfakianaki. "A review of total quality management applications in schools." *International Journal of Management in Education* 14.2 (2020): 121-134.

²⁰ Bayraktar, E., Tatoglu, E. and Zaim, S. (2008) 'An instrument for measuring the critical factors of TQM in Turkish higher education', *Total Quality Management and Business Excellence*, Vol. 19, No. 6, pp.551–574.

	- Graphical tools such as Histograms, Frequency diagrams and Pie charts - Statistical Quality Control(SQC) and Statistical Process Control (SPC) - Scatter Diagrams and Plots and Correlation Analysis - Operation and Process Flow Charts  Pareto Chart  Histogram  Run Chart  CHECK Sheet  Fishbone  Flow Chart  Scatter Diagram Figure 4: TQM tools
Market or applications being used most commonly	Manufacturing
Gaps within the subsequent methodology / Issues to be considered	TQM implementation needs to be supervised by E&T management and staff on a constant basis, allocating resources in an environment of cooperation and open communication. Commitment at the highest level is required so that TQM methods become effective. This would allow cultural changes to be observed for the development and systematic testing of the performance of the method.
Relevance to the project / Strong points to be consider	Well elaborated approach, with many stakeholders both in the educational sector and beyond using it for years. QI tools used to measure the effectiveness of the approach - link with digital methods that are also data-driven.

Digital Competence Framework

Id	6
Name	Digital Competence Framework (DigComp)
Description	DigComp is a tool that can be customized so that digital skills developed and acquired can be applied in any different context. DigComp can be used by a very wide target, i.e. both by companies and institutions and by trainers and educators involved in processes of development of digital skills for their users. DigComp is a framework that describes what it means to be digitally competent with a scale of 21 target skills, which refer to learning outcomes. 'Competence' refers to not only what a student knows and understands, but also what he is able to do. The learning levels correspond with 8 progressive outcomes, from beginner level to highly specialized.²¹ The key components of digital competence are distributed in 5 areas which are then expanded into 21 competences that make up digital competence (for detailed description see DigComp: The European Digital Competence Framework, pp.6):²² 1. Information and data literacy ○ Browsing, searching and filtering, ○ Evaluating, ○ Managing. 2. Communication and collaboration ○ Interacting, ○ Sharing, ○ Engaging in citizenship, ○ Collaborating, ○ Netiquette. ○ Managing digital identity 3. Digital content creation ○ Developing, ○ Integrating and re-elaborating, ○ Copyright and licenses, ○ Programming. 4. Safety ○ Devices, ○ Personal data and privacy, ○ Health and well-being,

²¹ [2020-09-D-51-en-2.pdf \(eursc.eu\)](#)

²² [Digital Competences Framework \(DigComp 2.2\) update published - Occupazione, affari sociali e inclusione - Commissione europea \(europa.eu\)](#)

	○ The environment. 5. Problem solving ○ Technical problems, ○ Identifying needs and responses, ○ Creatively using digital technologies, ○ Identifying digital competence gaps.
Key Characteristics in Education	'Part of the EU Member States has already harmonized their education and training policies according to the European reference framework'.²³ We can look at the acquisition of digital skills process as a progressive and transversal learning training that requires to be consolidated over time. This framework proposes several possible development paths, divided in turn into progressive steps that consider the student as a whole. Thanks to its interdisciplinary nature it can be applied in all school levels and as a basic criterion for all the disciplines covered because it has now become indispensable in all school paths to acquire and know how to use digital skills, and for trainers and teachers to know how to change approach and mentality. In this historical phase, taking into account digital skills through study programs should no longer appear as a constraint, but rather as a really important opportunity (as much as other key competences).²⁴
How are the results measured	DCF maps the proficiency levels of DigComp to the cycles in the European Schools. The DCF proposes, therefore, six proficiency levels.²⁵ Each proficiency level represents a step up in pupils and students' acquisition of the competence according to its cognitive challenge, the complexity of the tasks they can handle and their autonomy in completing the task. Each level of mastery considers several factors simultaneously: ● the student's level of familiarity with the proposed situation (simple, current, new), ● the complexity of practices with digital tools (elementary, complex), ● the degree of autonomy (with help, alone, shared with others),

²³ Carretero, S.; Vuorikari, R. and Punie, Y., DigComp 2.1: The Digital Competence Framework for Citizens with eight proficiency levels and examples of use, 2017, doi:10.2760/38842. DigComp offers a tool to improve anyone's digital competence, and has become since 2013 a reference for the development and strategic planning of digital competence initiatives both at European and Member State level. Many Member States have already integrated the European reference framework into their education and training policies.

²⁴ [2020-09-D-51-en-2.pdf \(eursc.eu\)](#)

²⁵ [2020-09-D-51-en-2.pdf \(eursc.eu\)](#)

	- the complexity of procedures (application, development) and goals to be achieved, - the knowledge necessary for their implementation.
Market or applications being used most commonly	Education
Gaps within the subsequent methodology / Issues to be considered	The methodology lacks green approaches to teaching and there is no area encompassing sustainability. Moreover, the methodology is used for students going to primary and upper high school, not the adults in VET education. Finally, it has to be adapted to the VET sector in the tourism industry.
Relevance to the project / Strong points to be consider	All educational staff can mobilize digital tools and resources that assist to the acquisition of digital competence in order to adapt the activities to the project's demands. At the micro level, the European Framework for the Digital Competence of Educators (DigCompEdu) can support and direct teachers' practice and ongoing professional development, while at the macro level, it can support the growth of school institutions as learning organizations by giving professional communities of practice a common platform for discussion, partnership, and ability to reflect. The teaching, learning, assessment, and related learning support activities carried out by a particular educational institution are the main emphasis of the DigCompOrg. The DigCompOrg framework offers a thorough and general conceptual framework that captures all facets of the methodical integration of digital learning in educational organizations across all educational sectors and it can be modified to fit the various environments.

Six-Sigma

Id	7
Name	Six-Sigma ²⁶
Description	Six Sigma is a methodology that improves organizational processes by streamlining operations, improving quality, and reducing defects

²⁶ https://en.wikipedia.org/wiki/Six_Sigma

	in order to increase profitability. Six Sigma actually stands for "six standards of deviation." The DMAIC (define, measure, analyze, improve, control) mode of action in Six Sigma searches for ways to incrementally enhance procedures that may already be in place but are performing below expectations. By promoting efficiency and reducing defects, companies can improve quality and save time. They can deliver better products, which can contribute to increased engagement and confidence among employees. When that happens, the company's bottom line is strengthened so as to better help drive it toward the top.²⁷
Key Characteristics in Education	By reducing administrative and enrollment procedures and enhancing student experience, the Six Sigma continuous improvement technique enhances higher education institutions.
How are the results measured	Once CTQs (critical to quality characteristics) have been identified, a combination of interviews and surveys is used to quantify their effect on the student pass rate and form the desired future state.
Market or applications being used most commonly	Education , Healthcare, Software
Gaps within the subsequent methodology / Issues to be considered	-
Relevance to the project / Strong points to be consider	• Measure Performance The use of Six Sigma can help the educational system better monitor pupils' growth over time. The educational system can examine a few elements that directly affect educational quality, such as teachers, curriculum, GPA, or the number of pupils in each class. • Student Satisfaction Schools and universities can use Six Sigma procedures to analyze student performances over a certain time period to determine each student's strengths and shortcomings.

²⁷ <https://honorlock.com/blog/what-is-six-sigma-and-how-does-it-apply-to-higher-education/>

Ethazi

Id	8
Name	Ethazi
Description	Ethazi is a learning methodology applied in the Basque Country (Spain) and used in VET Centers with a focus on Collaborative Learning based on Challenges. The approach of the model through challenges needs a reinterpretation of the mechanics of learning. 'The interpretation that best fits the model, is to understand learning as a process of evolution, where the students are responsible for it. Challenge-based learning allows a scenario in which students individually and team levels are put into action and produce a result. This result is interpreted, it is analyzed what has worked and what has not, and is decided what is going to be done differently in the next challenge to approach higher objectives'. ²⁸
Key Characteristics in Education	• Challenge-based learning • Continuous improvement and Evaluation • Intermodularity • Self-Managed Cycle Teaching Teams • Evaluation to evolve in competency development • Adaptation of Learning Spaces
How are the results measured	Inside each challenge there is a phase where the analysis has a leading role to measure the precision of the result. If the result of analysis indicates it's possible to improve the challenge, if there is time to do so, the phases of the whole process are then repeated.
Market or applications being used most commonly	Education
Gaps within the subsequent methodology / Issues to be considered	-
Relevance to the project /	• Introduction of problem-based learning • Collaborative learning and teamwork

²⁸ <https://tknika.eus/en/cont/proyectos/ETHAZI-3/>

Strong points to be consider	- Organizational flexibility - Fosters growth of diverse skillsets, technical and soft skills
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Bloom's Taxonomy of Educational Objectives

Id	9
Name	Bloom's Taxonomy of Educational Objectives https://en.wikipedia.org/wiki/Bloom%27s_taxonomy#cite_note-selander2012-22
Description	Educational philosophy and psychology applied worldwide. In educational psychology, Bloom's Taxonomy is a method used to classify the learning phases that constitute the educational process. Benjamin Bloom indicates the stratified phases in six fields: remember (base of the pyramid); to comprehend; to apply; to analyze, to evaluate, to create.
Key Characteristics in Education	Bloom's Taxonomy (Bloom, Engelhart, Furst, & Krathwohl, 1956) is one of the most well recognized learning theories in education. It is frequently used by educators to develop learning objectives that address not just subject content but also the depth of learning they want students to attain, as well as assessments that properly reflect on students' progress towards these ends (Anderson & Krathwohl, 2001).
How are the results measured	-
Market or applications being used most commonly	Bloom's taxonomy (and the amended taxonomy) continues to inspire educational theory and the development of innovative teaching practices. The development of higher-order thinking skills interacts well with a growing worldwide emphasis on diverse literacies and learning modes, as well as the new area of integrated disciplines. The capacity to interact with and produce media would depend upon abilities from both higher order thinking (analysis, production, and assessment) and lower order thinking (knowledge, understanding, and application).
Gaps within the subsequent	-

methodology / Issues to be considered	
Relevance to the project / Strong points to be consider	This Theory is easily applicable to a variety of fields at all educational levels and the graphic visualization and representation is very immediate and can be used by applying the so called 'pyramid' to the soft skills needed by VET tutors, educators and trainees when approaching AI and advanced technologies.

Methodology Research-Action

Id	10
Name	Methodology Research-Action Action research promoted by CNOS-FAP Lombardy Region with the contribution of the University of Bologna, Department of Educational Sciences to promote reflection on the repercussions and effects of an experiment in use of technological devices. https://www.diariodellaformazione.it/editoriali/riflessioni-sulla-sperimentazione-sullutilizzo-dei-dispositivi-tecnologici-nella-formazione-professionale/
Description	Educational methodology applied worldwide. Action research is a research method that combines scientific research with action, understood as the transformation of a context, educational in this case. It is a cyclical process in which participants, who are also the researchers themselves, engage in a research action, collecting data on the action and using the information to improve the starting context. The phases into which Lewin's model (1946) is divided are three: • the establishment of the action research group; • the definition, by the research group, of the research problem, the choice of methodology, the definition of the data collection tools, their analysis and the formulation of intervention hypotheses; • the context improvement intervention phase.
Key Characteristics in Education	In the didactic context the application of such method is setting up a mixed research group (Universities and representatives of professional training centers) which together defined objectives, phases, action research tools, working methods between presence and distance, return of results towards the transformation of the sector.

How are the results measured	Utilization of questionnaires, focus groups deducted results, interviews.
Market or applications being used most commonly	Education at all levels especially VET
Gaps within the subsequent methodology / Issues to be considered	
Relevance to the project / Strong points to be consider	Totally applicable to the EthAI Tour project, great way to interview and reach out directly to main target groups and to gain perceptions from students and educators.

Virtual Work-Based Learning in VET

Id	11
Name	Virtual Work-Based Learning in VET https://www.vwbl.eu/en/node/1
Description	The Virtual Work-Based Learning in VET is applied in EU Countries. The team implementing the European project 2020-1-PT01-KA202-078845 vWBL/Virtual Learning Work-Based (virtual Work-Based Learning) to simulate the authentic training experience digital VET, as part of the Erasmus+ programme, conducted an in-depth investigation at the start of its activities to identify new needs and problems in the field of digital training in VET, involving teachers and sector experts in countries such as Portugal, Estonia, Italy, Bulgaria, Cyprus and Poland.
Key Characteristics in Education	It essentially consists of "working", as the name indicates in the practical lessons, in terms of distance learning by adapting strategies to attract students and teachers and improve the teaching method, especially with the parts/subjects that are most difficult to teach remotely/

How are the results measured	Teachers' Learning Circles in schools and students gather valuable feedback.
Market or applications being used most commonly	Education
Gaps within the subsequent methodology / Issues to be considered	-
Relevance to the project / Strong points to be consider	Extremely applicable to the EthAI Tour project and very good practice to follow; in particular concerning teachers/educators: questionnaires can be readapted and reused as well as the idea of having recommendations drawn from it.

Project Management Body of Knowledge (PMBOK)

Id	12
Name	Project Management Body of Knowledge (PMBOK)
Description	The "Project Management Body of Knowledge" or PMBOK provides definitions and guidelines for project planning, scheduling, executing and controlling.
Key Characteristics in Education	The Project Management Institute (PMI) developed a certification program to acknowledge skills and experience in project management. The PMI certification requires that a person meet domain experience levels, educational levels or both to apply. ²⁹
How are the results measured	• Multiple-choice test that requires reviewing the PMP handbook • Exam content online

²⁹ <https://www.pmi.org>

	Formal study-courses offered by PMI chapters or accredited Registered Education Providers (REPs).³⁰
Market or applications being used most commonly	Research, education, industry
Gaps within the subsequent methodology / Pain points to be considered	-
Relevance to the project / Strong points to be consider	The methodology is very appropriate to be applied in the project management processes of EthAI Tour as it includes all the necessary processes and document flow needed.

Methodology of Educational Research

Id	13
Name	Methodology of Educational Research
Description	Educational methodology for research applied internationally This methodology describes every necessary step for research in an educational project. ³¹
Key Characteristics in Education	- Tools - Phases - Results
How are the results measured	Statistically, qualitative and quantitative

³⁰ <https://www.pmi.org>

³¹

<https://tripurauniv.ac.in/Content/pdf/StudyMaterialsDetail/MA%20Education%202nd%20Semester/ED-CN-801C-Methodology%20of%20Educational%20Research.pdf>

Market or applications being used most commonly	Educational projects
Gaps within the subsequent methodology / Issues to be considered	Big volume of information
Relevance to the project / Strong points to be consider	Scientific research

Project ECOSLIGHT- Deliverable R3.2

Id	14
Name	Project ECOSLIGHT- Deliverable R3.2
Description	'The project ECOSLIGHT deliverable entitled "Methodology for realizing VET curricula" provides the main methodology for the ECOSLIGHT project in order to implement the VET curricula; at a second level it provides the methodology adopted for the content production procedure for all components of the VET curricula (MOOC and Specialization Course, and work-based learning) ³²
Key Characteristics in Education	• VET Curricula • ECVET • Memorandum of Understanding • Grid of competencies
How are the results measured	• Credits • Competences
Market or applications being used	This is a practical example on how to apply Bloom's taxonomy.

³² https://www.ecoslight.eu/wp-content/uploads/2021/11/ECOSLIGHT_R3.2.pdf

most commonly	
Gaps within the subsequent methodology / Pain points to be considered	It is specific for the lighting sector but can be adapted
Relevance to the project / Strong points to be consider	Very detailed

SOLO Taxonomy

Id	14
Name	SOLO Taxonomy https://www.johnbiggs.com.au/academic/solo-taxonomy/
Description	Structured of the Observed Learning Outcome (SOLO) used to indicate level of understanding covered by a learning outcome This helps to classify learning outcomes in terms of their complexity. As a result, students would be assessed in relation to the quality of the evidence (assessment task/s given).
Key Characteristics in Education	It enables course planners and teaching teams to identify the level of understanding that is meant to be reached by the learner and as a result plan the learning outcomes appropriately. This in turn serves as a blueprint for subsequent teaching activities and assessment tasks to be associated with the level of understanding set by the learning outcome.
How are the results measured	Regular audit exercises to ensure that the learning outcomes devised adhere to the guidelines of the SOLO taxonomy.
Market or applications being used most commonly	Higher Educational Institutions (inc. VET)

Gaps within the subsequent methodology / Issues to be considered	One must ensure that the resulting learning outcomes are clear and not vague as otherwise they would be difficult to put to practice.
Relevance to the project / Strong points to be consider	A Strong point for this project as working with learning outcomes facilitates integration of the proposed curricula within the framework of the Bologna Process.

Constructive Alignment

Id	16
Name	Constructive Alignment https://www.tru.ca/_shared/assets/Constructive_Alignment36087.pdf
Description	Used to plan teaching and learning activities, and assessment tasks with learning outcomes. Starting from the outcomes that students are intended to learn, course designers then move on to plan and align teaching/learning activities and assessment tasks to these outcomes. The learning is 'constructed' by the activities students carry out. Assessment is a measure of achievement of the learning outcomes.
Key Characteristics in Education	Constructive alignment is one example of outcomes based education (OBE). Within the VET scenario, outcomes-based education offers the curriculum/course planners to merge theory with practice.
How are the results measured	One can refer to literature in academic journals illustrating practical applications of constructive alignment in various sectors of education.
Market or applications being used most commonly	All education sectors from early years to higher education.
Gaps within the subsequent	The major challenge is to ensure that intended learning outcomes, teaching/learning activities and assessment tasks are correctly aligned.

methodology / Issues to be considered	
Relevance to the project / Strong points to be consider	A strong point for this project is the fact that working with learning outcomes, facilitates integration of the proposed curricula within the framework of the Bologna Process. It is possible to refer to various 'best practices' in Europe and elsewhere.

Tuning Project (Educational Structures in Europe)

Id	17
Name	Tuning Project-(Educational Structures in Europe) https://www.unideusto.org/tuningeu/
Description	A process to facilitate course design and implementation. Originally initiated as a project to link the Bologna Process and the Lisbon Strategy, it evolved into a process of designing, developing, implementing, evaluating and enhancing quality first, second and third cycle degree programs.
Key Characteristics in Education	The key characteristic is that it does not promote uniformity but points of reference, convergence and common understanding. The diversity of the European education systems is seen as an asset and the independence of academic, subject specialists and local/national authority is respected.
How are the results measured	-
Market or applications being used most commonly	Mainly higher education
Gaps within the subsequent methodology /	Adequate training is requiredm given the philosophy of the methodology.

Issues to be considered	
Relevance to the project / Strong points to be consider	It may provide guidelines for curriculum/ course/program development that would be transferable to other parts of Europe yet allowing for diversity based on content, learner profile etc.

4. Conclusions

The tourism sector was already under critical alterations when the Covid-19 pandemic hit and further accelerated the use of AI for the improvement of efficiency and the customer's experience. The proliferation of AI tools resulted not only in the exploitation of its benefits, but also brought to light serious ethical concerns, including the loss of privacy, bias and transparency issues, which could, in their turn, generate negative outcomes for the travelers, the society and our environment.

The EthAI Tour project aims to form and propose an innovative VET offering, aspiring to aid VET trainers and trainees to adapt and align to the new market needs and economic challenges, focusing on the implications of the use of AI from an ethical perspective.

Based on the research outcomes of WP2/A2 and the consortium valuable contribution, a selection of methodologies and quality assurance models in industrial and business sectors was delivered.

In total 17 methodological frameworks, already exploited by consortium partners or identified in EU industrial & business environments were elaborated based on their applicability to address the project's needs, constituting the basis for the research work and analysis of the next Activity 3, the EthAI Tour 'Methodological Framework'.

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