AIR IN VET

Applied Innovation and Research in Vocational Education and Training

FRAMEWORK FOR APPLIED INNOVATION AND RESEARCH IN VET

Deliverable 4.2: Describing the Framework for AIRinVET

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Deliverable 4.2: Describing the Framework for AIRinVET

Lead partner	Katapult
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PUBLISHABLE EXECUTIVE SUMMARY

The Framework for Applied Innovation and Research in Vocational Education and Training, is designed for VET centres aiming to strengthen their impact in Research and Innovation (R&I). It serves as a dynamic and inclusive guide, not merely a set of rigid guidelines but a flexible structure adaptable to diverse challenges such as policy environments, local conditions, and institutional needs.

Because of the fact that there are many elements that need to be taken into account when a VET centre wants to initiate or scale up its R&I activities, it can be a complex process to obtain an overview of its own state of affairs. Within this Framework, all elements are therefore clustered per relevant area. The various areas in their turn, are forming four Dimensions:

Impact: covers the main objectives for conducting R&I activities, and the desired impact. **Activities**: offers an insight into the activities and functions of the VET center, that are relevant for R&I activities. **R&I**: is allowing the institution for VET education to dive deeper in the R&I activities that it would like to be involved in, (e.g. various research methods, and the various forms research output can have (like prototypes, articles, proof of concept, etc.). **Governance**: focusses on how to organise R&I activities, how to fund them, cooperation with partners.

More extensive descriptions of these dimensions are included in chapter 4 of this report.

In October 2024, a follow up report will be published, in which a description of a AIRinVET Roadmap will be included: it will show that a self-assessment tool, based on the dimensions described in this report, including the recommendations following out if its results, will facilitate VET centers to initiate and/or scale up their R&I activities.

LIST OF ACRONYMS AND ABBREVIATIONS

AIRinVET	Applied Innovation and Research in Vocational Education and Training
CoVE	Centre of Vocational Excellence (www.copcoves.eu)
PDCA	Plan-Do-Check-Act
PPP	Public Private Partnership(s) (https://business.gov.nl/regulation/public-private-partnership/)
R&I	Research & Innovation (activities)
SME(s)	Small and Medium-sized Enterprise(s)
VET	Vocational Education and Training

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1. INTRODUCTION TO THE AIRINVET FRAMEWORK

The Framework for Applied Innovation and Research in Vocational Education and Training is designed for VET centres aiming to strengthen their impact in Research and Innovation (R&I) at regional and, especially, local levels. It serves as a dynamic and inclusive guide, not merely a set of rigid guidelines but a flexible structure adaptable to diverse challenges such as policy environments, local conditions, and institutional needs.

This framework is built upon previous achievements and future aspirations within the VET sector. It extends the work of prior results presented in the glossary, the network map and the SMEs engagement and AR mindsets report.

1.1 For whom will the Framework be helpful?

The AIRinVET Framework is beneficial for a wide range of stakeholders within the VET ecosystem, including:

- **Educational Leaders and Administrators**: Looking to enhance their institution's capabilities in R&I.
- **Faculty Members, Researchers, and Curriculum Developers**: Seeking to integrate applied research principles into their educational practices.
- **Business Partners**: Seeking for added value for the business partners of VET Centres. Therefore, we pay special attention to SMEs to align collaborative projects with VET centres, foster practical innovation, or better understand potential collaboration.
- **Policymakers and Regional Development Agencies**: Supporting the strategic alignment of educational programs with regional economic and workforce development goals.

1.2 Developmental Nature

The AIRinVET Framework shall be used as a blueprint to create a usable roadmap for VET institutions. Every individual institution has its strategies and goals. While reading the Framework (and later its accompanying tools), it is essential to define the individual needs, and the Framework supports this mapping and decision-making process. Based on the Framework, a Self-Assessment Tool will be introduced to institutions of VET education to start up / scale up their R&I activities (in collaboration with SMEs) in their region and provide them with insight into their current state of affairs. To improve their R&I, they will be offered a tailored AIRinVET Roadmap based on those insights, consisting of **tools**, **recommendations** and **inspiration**.

Three-Step Process for using the AIRinVET framework by VET Centres:

1. Understanding the AIRinVET Framework: Familiarize with the foundational four-dimension model.
2. Adaptation to the Organisation: Use the AIRinVET Self-Assessment Tool to tailor the model to each institution's unique characteristics and aspirations, recognizing that one size does not fit all.
3. Roadmap Design: Develop a strategic plan for implementing and evolving R&I activities, as outlined in the "Roadmap for Applied Research in VET," including relevant tools, recommendations, and inspiration.

Right now, we will focus on the AIRinVET Framework: the Roadmap will be described in our next report[1].

1. AIRinVET Roadmap, expected publication date October 31

1.3 Change Management in VET Centres

Implementing change within an organisation is a comprehensive process that requires understanding and aligning various factors, including the principles of organisation, change management and the roles of different actors. The change management process is crucial for ensuring that the adaptations and transformations outlined by the AIRinVET framework are effectively integrated and sustained over time.

Fundamental principles of change management involved in this framework include:

- Clear Communication: Ensuring all stakeholders are informed and on board with the changes.
- Stakeholder Engagement: Involving educational leaders, faculty members, industry partners, and policymakers in the change process.
- Iterative Feedback Loops: Facilitating gradual and accepted changes across the organisation.
- Recognition of the important role of students: even though they will not directly be changing the management within VET centers, it is important they do have a role in the process: there are no VET centres without students.

Educational leaders, faculty members, industry partners, and policymakers are crucial in driving and supporting these changes. By engaging these actors and applying change management principles, VET centres can successfully implement the AIRinVET framework, enhancing their R&I impact and contributing to regional and local development goals.
The whole framework consists of a tripartite structure, a three-step process involving iteration. Once the roadmap is implemented, its monitoring will lead to a readaptation of the model again in a PDCA (Plan-Do-Check-Act) cycle, ensuring continuous refinement and relevance to changing educational landscapes.

2. UNDERSTANDING THE AIRINVET FRAMEWORK

The AIRinVET standard framework is based on four assumptions based on the four AIRinVET dimensions.

Assumption 1: VET - an essential actor in the regional innovation ecosystem

VET can be an important actor in the regional and local innovation ecosystem. We are assuming that any VET centre can potentially impact its local and regional innovation ecosystem. This assumption is based on a ten-month extended mapping study carried out in the second work package of the project and published under the title *Publication on AR actors, business models and case studies*[2] (Etxebeste, et al., 2023). Next, the need for innovation and the role of VET centres is also highlighted in the report SMEs engagement & AR mindsets. Cooperation in regional Public Private Partnerships (PPPs)[3] (or even international Centres of Vocational Excellence), with especially SMEs, is considered of high importance to develop valuable and sustainable R&I activities, creating real impact.

Assumption 2: focus on multifunctional VET centres

According to our glossary, which follows the Council Recommendation on VET (2020), we follow a broad definition of VET[4]:

- Involves young students and adults (including career changers). In other words, all age groups and all European citizens are potential VET students.
- Aims to equip any person with knowledge, skills and competences related to the labour market. At the same time, VET can have other functions, such as entrepreneurship or research.
- Studies do not need to be connected to a particular occupation. They can be, but they can have a broader focus, although always in connection with the world of work.
- Includes learning activities that can take place in formal and informal settings.
- Covers VET at the tertiary level. We consider higher VET to be part of VET, not part of Academic Education.

This means that the AIRinVET framework will also be **useful for tertiary education institutions**, regardless of their type of organisation.

In addition, we consider that VET centres can have functions that go beyond teaching and learning activities. We labelled the type of school performing these types of non-teaching and learning functions as "multifunctional", as reflected in our report 'Publication on AR actors, business models and case studies':
The primary function of all VET providers in Europe is to train students, giving them the knowledge, competences, and skills required for a specific job or occupation. This training is usually extended to reskilling and upskilling functions as part of continuing VET. We will refer to VET centres which have as their sole function to provide initial and continuing VET, or only initial, or only continuing, as "unifunctional". But many VET providers extend the scope of their activities further: technical services for companies, working as incubators for entrepreneurs, providing services for the community, etc. We will refer to these as "multifunctional VET centres". Multifunctional VET centres are centres that perform the activities of an "unifunctional VET centre" (training) and complement them with other activities that differ from training (Navarro & Retegi, 2018).

The framework is aimed at multifunctional VET centres.
Unifunctional VET centres might find it useful as well, but most of the activities will be out of their scope.

2. D2.2 Publication on AR actors, business models and case studies.pdf (airinvet.eu)
3. https://business.gov.nl/regulation/public-private-partnership/: In a public-private partnership (PPP or Publiek-Private Samenwerking, PPS, in Dutch), companies and government bodies or civil society organisations work together. In the area of housing, for example, or infrastructure. The partnership may be solely financial (donations and sponsorship), but may also involve a more concrete collaboration. PPP is based on two main principles:
   - Both parties invest in the project. In a financial sense (manpower, materials budget) and in an expertise-related sense (knowledge, networks).
   - The parties contribute to a societal and often also commercial purpose.
4. Vocational education and training is to be understood as the education and training which aims to equip young people and adults with knowledge, skills and competences required in particular occupations or more broadly on the labour market. It may be provided in formal and in non-formal settings, at all levels of the European Qualifications Framework (EQF), including tertiary level, if applicable. (THE COUNCIL OF THE EUROPEAN UNION, 2020)

Assumption 3: R&I: more than just Applied Research done by VET

Although the title of this report is *Framework for Applied Innovation and Research in VET*, the framework is not exclusively oriented towards applied research. The reason is that when we carried out our mapping study, we found out that, apart from a few anecdotal cases, the research done by VET institutions is focused on their own activities, such as education and education development. If we define research following the OECD definition , we can understand it as "VET institutions doing research themselves". This does not mean that VET does not have an effect on innovation systems, especially at the local level. VET should thus be included and recognised as important actors in the innovation system.

It is important to note here that many of the activities done by VET Centres we learned about in this project, while not research activities, are knowledge-related activities that directly impact enterprises, especially SMEs. Universities and other classic actors in the research world are far from achieving an impact like this. Taking this into account, a better title for the framework would be *Framework for Research and Innovation in VET*. Whereby research and innovation (R&I) is understood as the contribution of a VET centre to the local, regional or national innovation system, especially when it goes further than skilling and when it has an impact on the introduction of improved products or processes (or a combination thereof). More specifically, we succeeded in identifying VET centres which provide services for companies to help them solve real-life problems through various activities, such as test beds, sharing equipment, proofs of concept, testing and simulations. **We will use the expression "research and innovation" (R&I) instead of "Applied Research" or 'Applied Innovation and Research'.**

Assumption 4: increasing impact

The impact of R&I activities carried out by VET institutions (mainly in cooperation with SMEs and potentially other partners within PPPs) can of course be found in an improved curriculum for students, better-skilled teachers/researchers, and having the school becoming a more and more indispensable actor within the open innovation ecosystem of its region. However, next to that, R&I activities can contribute to solving real-life problems and provide ways to think and work differently about the challenges we are facing nowadays. The impact made is therefore not only of relevance for the VET institution involved, nor for just the SMEs or other partners within the cooperation; it is a longer-term impact on society as a whole as well when innovations really change the way we deal with the problems we are facing. In this way, Research and Innovation activities make a valuable contribution to, for example, the green and digital transitions.

5. An original investigation undertaken in order to acquire new knowledge. It is, however, directed primarily towards a specific, practical aim or objective. -Source: OECD (2015), Frascati Manual 2015: Guidelines for Collecting and Reporting Data on Research and Experimental Development, The Measurement of Scientific, Technological and Innovation Activities, OECD Publishing, Paris, https://doi.org/10.1787/9789264239012-en

3. THE FOUR DIMENSIONS OF THE AIRINVET FRAMEWORK

The AIRinVET framework is built based on the assumptions discussed in the previous chapter. It consists of four dimensions that are interconnected but also of individual importance.

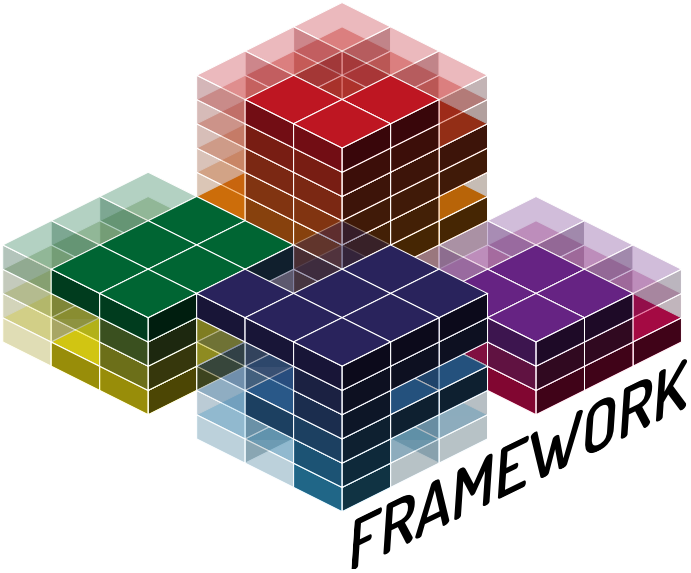


Image 01: The AIRinVET Framework

Impact: Looks at the strategic objectives for conducting R&I activities, the assessment methods for their results, and the motivation behind these endeavours. This dimension also considers R&I mindsets and incentive structures. It answers many WHY questions: why is the VET institution (wanting to be) involved in R&I activities, what motivation is there, and what do they want to reach/change: what impact would they like to make on the short and longer term?

Activities: This dimension focuses on the organisation's internal dynamics, cataloguing all functions and activities and profiling the academic and institutional types. It is crucial to understand the existing knowledge and expertise, which form the base upon which innovation activities are built.

Research and Innovation: Encompasses the fields and areas suitable for R&I within the organisation, including methodologies, outcomes, involved actors, and the influence of the local or regional ecosystem. It lays the groundwork for defining the scope of R&I initiatives.

Governance: This section offers strategies for managing R&I processes and highlights potential barriers and enablers within the organisational and wider ecosystem.

3.1 Areas of the Dimensions

Having established an understanding of the Framework's structure, we can now explore the four Dimensions that form the foundation of the AIRinVET Framework.

Each of the four Dimensions encompasses various areas, which consist of specific elements to consider during R&I activities. Initially, these areas were quite broad, so we aimed to narrow down their composition.

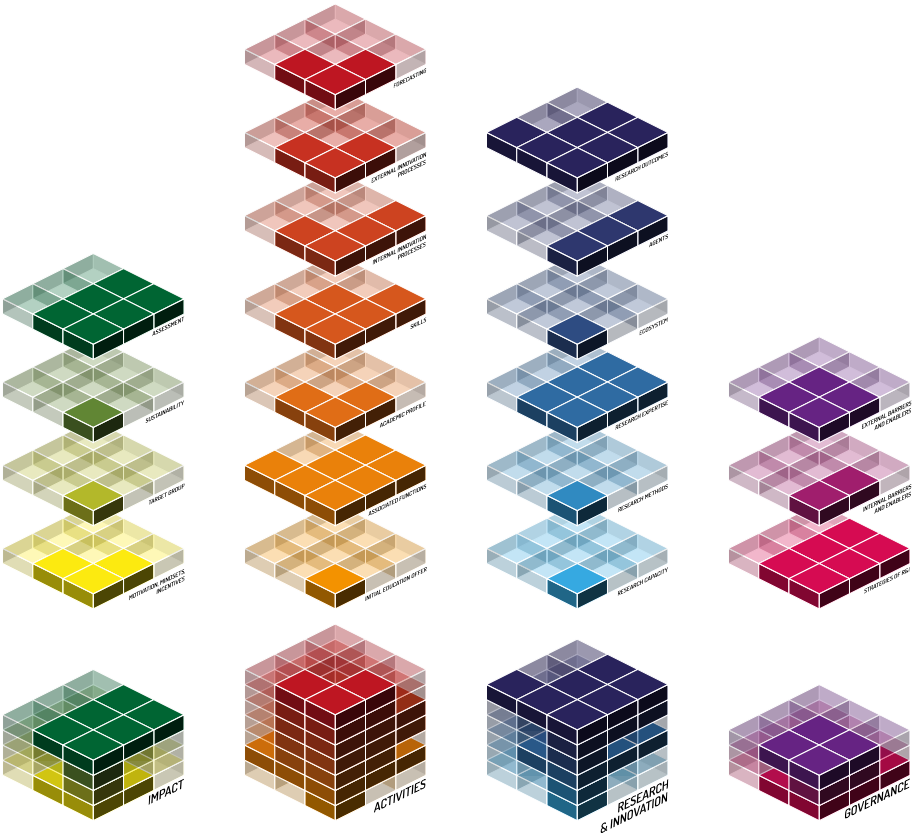


Image 02 – The AIRinVET Framework: Dimensions and Areas

We will begin by showing the four Dimensions and outlining the Areas within each one:

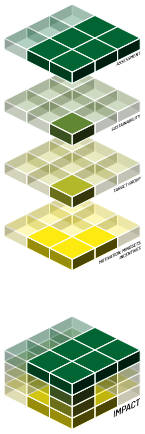
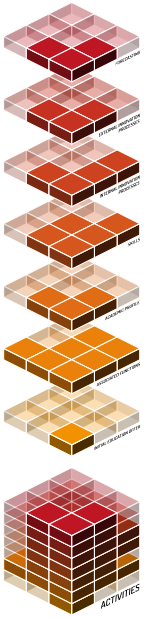


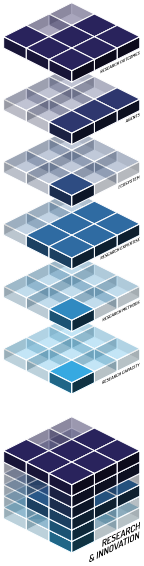
Image 03: Dimension 1 – IMPACT - Dimension and Areas

1. **Impact**: This includes the main objectives of the organisation, such as doing R&I activities at the local or regional level, and how VET can assess the results of the activities. It also includes aspects related to motivation, R&I mindsets, and incentives. Areas included:
   - Motivation, mindsets, incentives
   - Target groups
   - Sustainability
   - Assessment



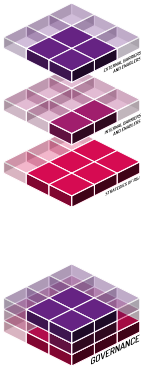
2. **Activities**: Includes all functions that are related to R&I activities. It also includes elements related to the type of organisation and its academic profile. Areas included:
   - Initial education
   - Associated functions
   - Academic profile
   - Skills
   - Internal innovation processes
   - External innovation processes
   - Forecasting

Image 04: Dimension 2 – ACTIVITIES - Dimension and Areas



3. **Research and Innovation**: Includes the areas and fields in which the organisations can carry out R&I, research methods used, R&I outcomes, actors involved, and the local or regional ecosystem. Areas included:
   - Research capacity
   - Research methods
   - Research expertise
   - Ecosystem
   - Agents
   - Research outcomes

Image 05: Dimension 3 – RESEARCH AND INNOVATION - Dimension and Areas



4. **Governance:** Governance and organisational management, including strategies to conduct R&I and the main barriers and enablers. It also includes the ecosystem. Areas included:
   - Strategies of R&I
   - Internal barriers and enablers
   - External barriers and enablers

This model describes the four dimensions that are relevant for a VET centre to work on R&I.

Image 06: Dimension 4 – GOVERNANCE - Dimension and Areas

3.2 Prioritizing the Dimensions

Our proposal for VET centres interested in starting or expanding R&I activities would be to examine first the **IMPACT** Dimension. It is necessary understanding the purpose behind their involvement in R&I before they can delve into the remaining three dimensions to further define their approach:

- **ACTIVITIES**: Assess current functions and existing activities and identify desired R&I activities for development.
- **RESEARCH and INNOVATION**: Evaluate their research capacity and potential for innovation.
- **GOVERNANCE**: Determine how to effectively organize and manage these activities.

4. DEEPER INTO THE FRAMEWORK: DIMENSIONS, AREAS, ELEMENTS

In this section, you will find the description of each Dimension and each Area in more detail, including the Elements within each area. The development of the dimensions areas and elements has been based on the knowledge and expertise of the project partners (see for example the Peer Review Model of Katapult, in the Netherlands and the TKgune programme from TKnika, in the Basque Country). Of course, also previous findings within this AIRinVET project have been used to base the framework on.

Relevance of the elements for R&I

The relevance of each element concerning R&I activities will also be described. The relevance of each element concerning R&I activities is closely connected to the motivation of VET institutions and the impact they want to make. For each VET institution this will be different, depending on its situation, regional context, capacities, etc. In this part, we will show that there is no 'one size fits all' approach.

4.1 Dimension 1: Impact

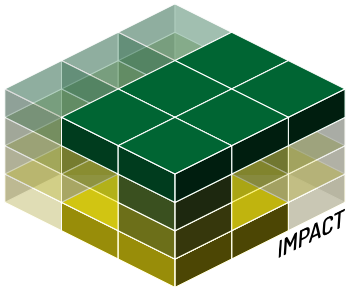


Image 07: Dimension 1, Impact, Areas and Elements

As mentioned before, this dimension covers the main objectives for conducting R&I activities at local or regional level, and how VET can assess the results of these activities. It includes elements related to motivation, R&I mindsets and incentives. Additionally, it involves defining the impact the VET centre aims to achieve through R&I activities, such as desired changes in the short or long term, in collaboration with regional Small and Medium-sized Enterprises (SMEs).

Please note that this dimension is important to establish a starting point and define the scope of R&I activities. Without a clear understanding of WHY a VET centre wants to engage in R&I activities, and the changes they aim to achieve, the R&I efforts may lack direction and purpose. Areas and elements concerning the IMPACT of the R&I activities that should be taken into consideration are:

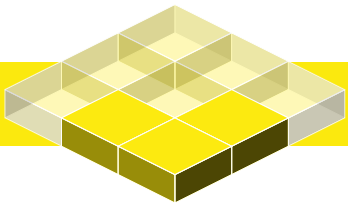


Image 08: Motivation, mindsets, incentives

Area: Motivation, mindsets, incentives

Motivation

To have clear WHY the people within the VET centre want to do R&I – what is their motivation to get involved in R&I – being for example gathering new knowledge, having access to equipment, solving real life problems of companies, personal fulfilment, etc.

Understanding the underlying motivations and incentives driving individuals within the VET centre to engage in R&I activities.

Aligning R&I initiatives with the intrinsic and extrinsic motivations of stakeholders, such as the pursuit of new knowledge, access to state-of-the-art equipment, opportunities to address real-world challenges, personal fulfilment, career advancement, or professional recognition, to foster enthusiasm, commitment, and ownership in R&I endeavours.

Open mindset

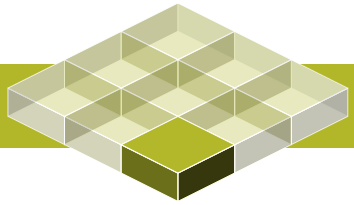
To have an open mindset about R&I and related issues. Cultivation of a receptive and flexible attitude towards research and innovation (R&I) and related concepts, practices, and opportunities within the VET centre.

R&I activities emphasize the importance of fostering an open mindset among stakeholders to embrace change, explore new ideas, experiment with innovative approaches, and adapt to evolving trends, challenges, and opportunities in R&I, promoting creativity, resilience, and adaptability in the pursuit of excellence and impact.

Incentives

Indicate what are incentives for doing R&I. Identification of the various rewards, benefits, or incentives that motivate individuals, organisations, and stakeholders to engage in research and innovation (R&I) activities.

R&I activities involve recognizing and leveraging incentives such as funding opportunities, intellectual property rights, professional recognition, career advancement, networking, access to resources and expertise, solving complex problems, addressing societal needs, and contributing to economic development and competitiveness to stimulate participation, collaboration, and investment in R&I initiatives.

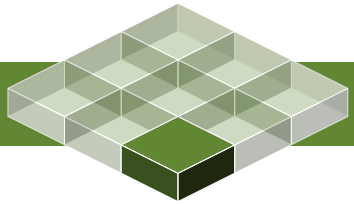


Area: Target group

Image 09: Target group

Consider who is the target group. Deliberation on the primary beneficiaries or stakeholders of the research and innovation (R&I) activities, which may include SMEs, larger companies, students, local communities, or society at large.

R&I activities involve identifying the specific needs, interests, and objectives of target- groups to tailor R&I initiatives, foster stakeholder engagement, and maximize the societal impact and value creation of research outcomes.

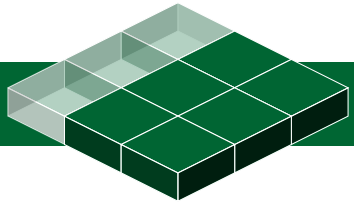


Area: Sustainability

Image 10: Sustainability

The viability, resilience, and enduring impact of collaborative projects or partnerships in research and innovation (R&I) over time.

R&I activities could emphasize the importance of considering long-term sustainability factors, such as financial viability, institutional support, stakeholder engagement, scalability, replicability, and societal relevance, to ensure the continuity, effectiveness, and legacy of R&I initiatives beyond initial funding or project cycles, fostering enduring partnerships, capacity-building, and positive societal outcomes.



Area: Assessment

Image 11: Assessment

Ex ante evaluation: An assessment performed after development of the roadmap, but before execute it, preferably by an external party, that answers the questions, whether and to what extent with this roadmap and the activities included the objectives set by the VET Centre will be reached. The 'Assessment - internal by VET' is an example of this kind of evaluation.

Roadmaps to integrate R&I activities do not automatically lead to the expected outcomes. Therefore an evaluation ex ante is necessary. Based on this evaluation the roadmap can be improved. Ex ante evaluation leads to a higher level of certainty that investments in building up R&I activities in a VET centre have been useful spent.

Summative evaluation: examination after completion of a project or roadmap implementation whether and to what extend the objectives that to be achieved with the implementation of the roadmap have actually been achieved, thus giving insight in het effectiveness of the roadmap and its implementation. This assessment is part of the check-activity of the PDCA cycle.
Roadmaps to integrate R&I activities in a VET Centre are made before the implementation. To learn from the implementation, and to see to what extent the results are achieved a summative assessment shows how effective the roadmap and its implementation were to reach the objectives set by the VET Centre.

Formative evaluation: assessment of the implementation of execution of the roadmap, during the implementation and execution.
During the implementation and execution of roadmaps for implementation of R&I activities it is needed to assess if everything is going well. Based on this continuous assessment it is easy to see which changes are needed to reach the objectives. By doing this during the project, adaptions can be made at the moment the deviations of struggles come into being and spills of time and money will be low.

Internal by VET: Examination of the process of evaluating the effectiveness, efficiency, and impact of R&I activities conducted internally within the VET centre.
R&I activities could emphasize the importance of internal assessment and evaluation mechanisms to monitor progress, identify strengths and weaknesses, and inform evidence-based decision-making, continuous improvement, and strategic planning in R&I endeavours.

Internal by SME: Recognition of the role of SMEs or industry partners in conducting assessments or evaluations of R&I projects or collaborations with VET centres.
R&I could involve engaging SMEs in the assessment process to gather feedback, assess outcomes from their perspective, and ensure alignment with their needs, expectations, and objectives, fostering mutual learning, trust, and collaboration between academia and industry.

External (3rd party): Acknowledgment of the involvement of external entities or third-party evaluators in conducting assessments or evaluations of R&I initiatives independently from the VET centre or participating stakeholders.
R&I activities could emphasize the importance of external assessments to provide impartial, objective, and credible evaluations, validate findings, and enhance transparency, accountability, and credibility in R&I practices and outcomes.

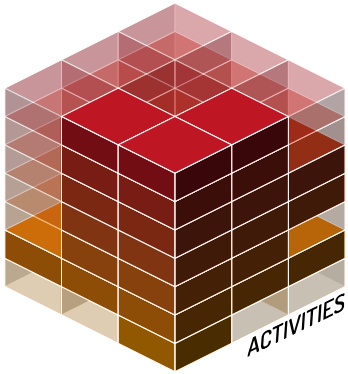


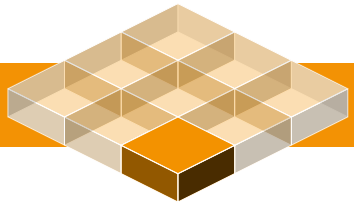
Image 12: Dimension 2, Activities, Areas and Elements

4.2 Dimension 2: Activities

Once the motivation and desired impact for R&I has been formulated clearly, it is time to dive into the next Dimension: ACTIVITIES and functions of the VET centre. It refers to the VET centre itself and helps to draft a knowledge map. This dimension includes all functions and activities, as well as the type of institution and its academic profile. This dimension is important to obtain a clear picture of the knowledge and expertise within the VET institution.
.It is highly recommended to connect the R&I activities to existing knowledge and expertise, thus avoid situations wherein both the activities and the needed substantive knowledge and expertise are new for the VET centre. Therefore, this Dimension is important to define the scope of the potential R&I activities of the VET centre.

Areas and elements concerning the ACTIVITIES of the VET centres that can be taken into consideration are:

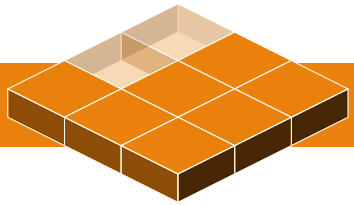
Image 13: Initial education offer
Initial education offer



Area: Initial education offer

Image 13: Initial education offer

Expected to take place in all VET institutions. The foundational educational programs provided by VET centres, encompassing essential skills and knowledge required for entry-level positions in various fields.
Research and Innovation activities in this context involve designing innovative teaching methods and curricula to enhance learning outcomes and meet evolving industry demands.



Area: Associated functions

Image 14: Associated functions

Continuous Education offer
Ongoing learning activities and programs aimed at updating and expanding the skills and knowledge of individuals beyond their initial education.
R&I activities focus on developing innovative approaches to deliver continuous education effectively, such as personalized learning pathways and adaptive technologies.

Entrepreneurship
The cultivation of an entrepreneurial mindset, skills, and knowledge to foster innovation, creativity, and business acumen.
Applied research in entrepreneurship involves investigating effective strategies for integrating entrepreneurial education into VET programs and supporting aspiring entrepreneurs in developing innovative ventures.

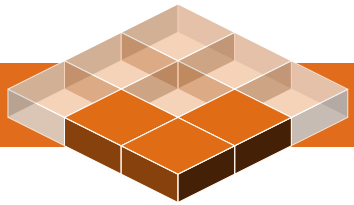
Career Guidance
Support services aimed at assisting individuals in making informed decisions about their career paths, including identifying interests, strengths, and opportunities for skill development.
Skills of teachers, students and researchers could be (further) developed by R&I activities, e.g.: research methodology could form part of the curriculum. Vice versa, the skills of students, teachers and researchers can be beneficial when conducting R&I activities.

Apprenticeships(/dual system)
Structured programs combining workplace learning with formal education, typically involving apprenticeships or dual education systems.
To do applied research: designing and implementing innovative apprenticeship models, enhancing collaboration between educational institutions and employers, and ensuring the relevance of skills taught in the workplace.

Inclusion: Guidance on disabilities
Support services and accommodations designed to assist individuals with disabilities in accessing and participating in education and training programs.
R&I activities: innovative approaches to inclusive education, such as universal design principles, assistive technologies, and personalized support services tailored to the needs of learners with disabilities.

Inclusion: Guidance on possible drop out
Interventions and support services aimed at identifying and addressing risk factors that may lead to early school leaving or dropout.
Concerning applied research: developing innovative strategies for early detection, personalized interventions, and holistic support systems to prevent dropout and promote educational attainment among at-risk learners.

Train the trainers
Programs and initiatives aimed at developing the competencies of VET teachers and trainers to effectively deliver high-quality education and training.
Applied research: innovative training methodologies, professional development opportunities, and the integration of emerging technologies to enhance the effectiveness of trainer training programs.



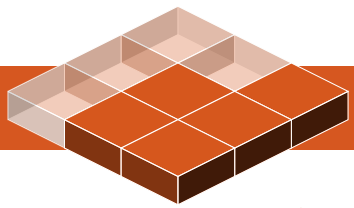
Area: Academic profile

Image 15: Academic Profile

Teaching fields in which education / training is offered:
Specialized areas or fields in which VET institutions provide education and training programs, such as technology, social media, manufacturing, business, health and others.
R&I activities: innovative approaches to curriculum design, delivery methods, and industry partnerships to meet the evolving needs of learners and industries within specific domains.

EQF level(s)
The European Qualifications Framework (EQF) levels indicating the complexity and depth of knowledge and skills acquired through education and training programs. Hereby a link to the various EQF levels and how they are defined.
Applied research needs to cater to the EQF level offered by the VET institution involved, recognizing prior learning, and developing innovative assessment methods to validate competencies and facilitate seamless transitions between education and employment.

Public / private status of the VET institution
The ownership and funding structure of VET institutions, whether they are publicly or privately operated or funded.
The public/private status of the VET institution has an impact on collaborations and partnerships, also when being involved in R&I activities. Funding models, and governance arrangements on the quality, accessibility, and sustainability of VET provision, as well as innovative financing mechanisms to support VET initiatives, influence the way the VET centre can be involved in research and innovations activities.



Area: Skills development and pedagogical process definitions

Image 16: Skills

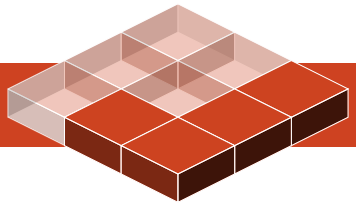
Curriculum development
The process of designing and updating educational programs to ensure alignment with industry needs, educational standards, and learner outcomes.
Concerning applied research: curriculum development involving integrated innovative teaching methodologies, emerging technologies, and industry trends into the design and implementation of VET curricula to enhance relevance and effectiveness.

Educational research
Systematic inquiry into effective teaching and learning strategies, instructional approaches, and educational theories to enhance learning outcomes.
Applied research in this area focuses on developing and evaluating innovative pedagogical practices, leveraging technology-enhanced learning environments, and promoting learner engagement and motivation.

Workforce development: Consultancy services on training programs for companies (upskilling, re-skilling)
Expert advice and support provided to companies to develop and implement training programs aimed at upskilling or re-skilling their workforce.
R&I activities explore innovative approaches to needs assessment, curriculum design, delivery methods, and evaluation frameworks to address the evolving skill demands of industries and promote workforce development.

Job transitions dynamics
Investigation into the dynamics and impact of job transitions within companies, including internal mobility, career advancement, and skill transitions.
R&I activities examine innovative strategies for facilitating smooth job transitions, such as competency mapping, career development programs, and talent management initiatives, to enhance organisational agility and employee satisfaction.

Future jobs
Investigation into emerging occupations, skills requirements, and workforce trends driven by technological advancements, economic shifts, and societal changes.
R&I activities would involve analysing labour market data, conducting occupational foresight studies, and engaging with industry stakeholders to identify emerging job opportunities, anticipate skill demands, and inform educational and training strategies to prepare individuals for future employment.



Area: Development of internal innovation processes

Image 17: Internal innovation processes

Implementation of technological innovation(s)
The adoption and integration of new technologies and digital tools to enhance teaching, learning, and administrative processes within VET institutions.
R&I activities focus on identifying emerging technologies, evaluating their potential impact on education and training, and developing innovative strategies for technology integration, infrastructure development, and digital literacy enhancement.

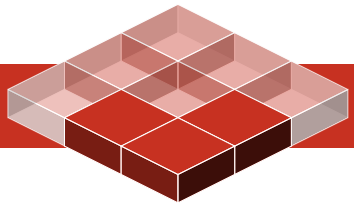
Implementation of process innovation(s)
The redesign and optimization of organisational processes, workflows, and systems to improve efficiency, effectiveness, and quality (in VET provision).
R&I activities investigate innovative approaches to process reengineering, change management, and continuous improvement methodologies, to streamline operations and enhance service delivery.

Implementation of social innovation(s)
Initiatives and interventions aimed at addressing societal challenges, fostering social inclusion, and promoting equity and diversity within VET systems.
R&I activities explore innovative solutions to social issues, such as inclusive education policies, community engagement programs, and partnerships with social enterprises and NGOs, to create more inclusive and supportive learning environments.

Evaluation

Evaluation of the feasibility, effectiveness, and potential impact of emerging technologies and innovative solutions in real-world and/or educational settings.

R&I activities involve piloting and assessing new technologies, such as virtual reality, artificial intelligence, and blockchain, to determine their suitability for enhancing teaching and learning experiences, improving educational outcomes, and fostering innovation in VET.



Area: Developing external innovation processes

Image 18: External innovation processes

Technical services/solutions

Provision of specialized technical expertise, support, and project-based solutions to address practical challenges and innovation needs of companies. Technical services and projects to solve companies real life problems.

R&I involves collaborating with industry partners to identify, analyse, and develop innovative solutions to real-world problems, such as product development, process optimization, and quality improvement initiatives, to drive business innovation and competitiveness.

Open innovation ecosystem

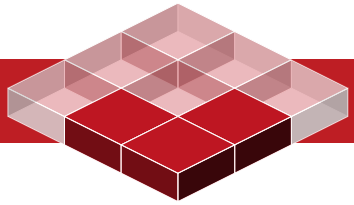
A collaborative network and environment that facilitates the exchange of knowledge, ideas, and resources among various stakeholders, including VET institutions, companies, research organisations, and policymakers.

R&I: fostering open innovation ecosystems, such as co-creation platforms, innovation hubs, and cross-sector partnerships, to promote knowledge sharing, collaboration, and collective problem-solving for societal benefit.

Equipment sharing linked to innovation(s)

Collaborative arrangements and practices for sharing equipment, facilities, and resources among VET institutions, companies, and other stakeholders to support innovation and skills development.

R&I: such as shared labs, maker spaces, and mobile learning units, to increase access to state-of-the-art technologies, reduce costs, and promote collaboration in applied research and development.



Area: Forecasting

Image 19: Forecasting

Educational Forecasting

Anticipating future developments and trends in educational theories, teaching methodologies, and learning technologies through systematic analysis of data and insights.

Research and Innovation activities in pedagogical forecasting involve analysing emerging trends, technological advancements, and societal changes to inform strategic planning, curriculum design, and pedagogical innovation in VET provision.

Technological Forecasting
Predicting future developments and advancements in technology, including digital tools, automation, and artificial intelligence, and their potential implications for education and training.
R&I in technological forecasting examines key technological trends, disruptive innovations and their impact on VET systems, workforce skills, and employment opportunities to inform policy-making and strategic investment decisions.

Social Forecasting
Projecting future social dynamics, demographic shifts, and cultural changes that may influence education, training, and workforce development.
Applied research in social forecasting analyses socio-economic trends, demographic patterns, and societal values to anticipate emerging challenges and opportunities for VET provision, equity promotion, and skill development, guiding policy formulation and program development efforts.

This reorganisation groups related items together and provides a clear structure for understanding the areas and elements concerning VET centre activities.

Image 20: Dimension 3, Research and Innovation, Areas and Elements

4.3 Dimension 3: Research & Innovation

The third Dimension that needs to be taken into account is RESEARCH AND INNOVATION itself: this includes the areas and fields in which the organisations are able to carry out research or work on innovations, research methods used, research/ innovation outcomes, actors involved, and the local or regional ecosystem. This dimension is important to establish a starting point and define the scope of R&I activities.

Areas and elements concerning R&I activities (existing and desirable) that need be taken into account are:

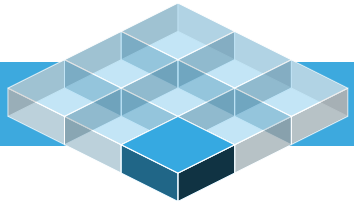
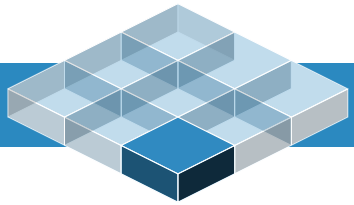


Image 21: Research capacity

Area: Research capacity

Facilities and equipment of VET institutions (willing to be) doing R&I
The physical infrastructure and resources available within VET institutions, which may include laboratories, workshops, technology centres, and specialized equipment, intended to support research and innovation activities.
Research and Innovation emphasizes the importance of investing in state-of-the-art facilities and equipment to facilitate hands-on experimentation, prototyping, and collaborative projects across various domains.

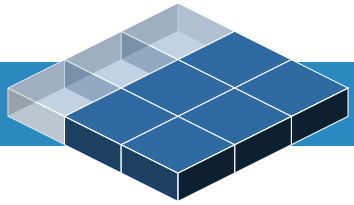


Area: Research methods

Image 22: Research methods

Research methods

Various approaches and techniques employed to conduct research, including:
data collection, desk research (literature review) data analysis, experiments, projects, prototyping, and others.
Research and Innovation involves selecting and combining appropriate methods to address research questions, gather evidence, generate insights, and validate hypotheses, aiming to produce actionable results and practical solutions.



Area: Research expertise

Image 23: Research expertise

Teacher engagement

Participation of VET instructors and educators in research and innovation activities, ranging from contributing domain expertise to leading research projects and mentoring students.
Research and Innovation emphasizes the role of teachers in bridging theory and practice, integrating research findings into curriculum development, and fostering a culture of inquiry and continuous improvement within educational institutions

Researcher engagement

Engagement of professional researchers, including academics, scientists, and industry experts, in collaborative research projects with VET institutions.
Research and Innovation involves partnering with researchers to leverage their expertise, access specialized knowledge and resources, and enhance the quality and impact of research outcomes through interdisciplinary collaboration and knowledge exchange.

Student engagement

Participation of VET students in research and innovation activities, including hands-on projects, internships, and collaborative research initiatives.
Research and Innovation promotes active learning, critical thinking, and problem-solving skills among students, providing opportunities for experiential learning, professional development, and exposure to real-world challenges and industry practices.

Training of teachers to improve their R&I skills

Professional development programs and initiatives aimed at enhancing the research and innovation capabilities of VET teachers and instructors.
Research and Innovation involves providing training in research methodologies, project management, data analysis, and other relevant skills to empower educators to effectively integrate research into teaching practice, foster innovation, and contribute to knowledge creation and dissemination.

Training of researchers to improve their R&I skills

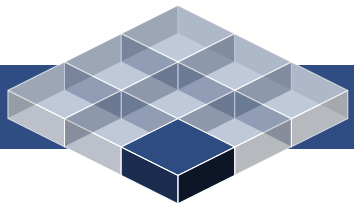
Capacity-building activities designed to strengthen the research and innovation competencies of academic researchers, industry professionals, and other stakeholders involved in collaborative projects with VET institutions.

Research and Innovation emphasizes continuous learning and skill development, offering training opportunities in research methodologies, grant writing, technology transfer, and entrepreneurship to support researchers in conducting high-quality research and translating findings into practical solutions.

Training of students to improve their R&I skills

Educational programs and initiatives aimed at developing students' research and innovation skills, including critical thinking, problem-solving, communication, and collaboration.

Research and Innovation emphasizes experiential learning, mentorship, and hands-on research experiences, empowering students to design and conduct research projects, analyze data, and communicate findings effectively, preparing them for future careers in academia, industry, or entrepreneurship.



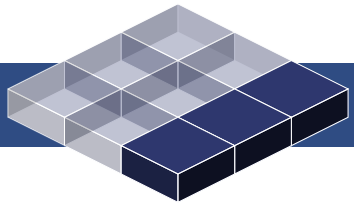
Area: Ecosystem

Image 24: Ecosystem

Ecosystem: possible regional partners and stakeholders

The network of organisations, institutions, and stakeholders within a specific region or community that collaborate and interact to support research and innovation activities in VET.

Research and Innovation involves engaging with regional partners, such as businesses, industry associations, government agencies, research institutes, and community organisations, to leverage complementary expertise, resources, and networks, foster knowledge exchange, and address local challenges and opportunities collaboratively.



Area: Agents

Image 25: Agents

Public institutions

Participation and collaboration of government agencies, ministries, and public organisations at the national, regional and/or local level in research and innovation initiatives in VET.

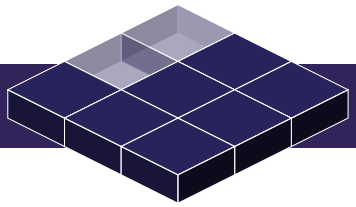
R&I involves engaging with public institutions to align research priorities, policies, and funding opportunities, leverage public resources, and ensure the relevance, sustainability, and societal impact of research activities in addressing key challenges and opportunities in VET.

Public / private agents

Participation of public and private entities, including research centres, innovation clusters, universities, companies, and industry associations, in collaborative networks and partnerships to support research and innovation in VET.

Research and Innovation involves fostering multi-stakeholder collaborations, leveraging diverse expertise and resources, and promoting knowledge exchange and technology transfer to drive innovation, competitiveness, and economic growth in the VET sector and beyond.

Alliances
Strategic partnerships and alliances formed between VET institutions and small and medium-sized enterprises (SMEs), large corporations, startups, industry associations, and other stakeholders to foster innovation and entrepreneurship in VET. Forming a network.
R&I activities involve collaborating with diverse partners to co-create solutions, share best practices, access funding and markets, and address industry needs.



Area: Research outcomes

Image 26: Research outcomes

Book
Scholarly publications or monographs resulting from research activities, providing in-depth analysis, findings, and insights on a particular topic or research project.
Research and Innovation may produce books that contribute to the academic discourse, disseminate research findings, and serve as valuable resources for educators, practitioners, policymakers, and other stakeholders interested in the field of VET and related areas.

(Journal) Article(s)
Peer-reviewed articles published in academic journals, presenting original research findings, methodologies, and theoretical contributions relevant to VET and related fields.
Research and Innovation aims to disseminate research outcomes through (high-quality) journal articles, contributing to the advancement of knowledge, informing evidence-based practices, and fostering scholarly dialogue and collaboration within the research community.

Portfolio(s)
Compilation of research projects, publications, presentations, and other scholarly activities showcasing the achievements and contributions of VET institutions, researchers, and students in the field of research and innovation.
Research and Innovation activities involve creating portfolios to document and communicate the impact, relevance, and excellence of research endeavours, supporting institutional branding, outreach, and funding efforts.

Product(s)
Tangible outputs or innovations resulting from research and development activities, such as software applications, tools, prototypes, and devices.
R&I aims to translate research findings into practical solutions, products, or services that address industry needs, and contribute to economic growth and societal development through technology transfer and commercialization.

Prototype(s)
Early-stage models or representations of products, systems, or solutions developed to test feasibility, functionality, and performance before full-scale implementation.
R&I involves prototyping as a means to iteratively design, refine, and validate innovative ideas, technologies, and interventions, accelerating the innovation process and minimizing risks associated with product development and deployment.

Proof of concept
Experimental evidence or demonstration validating the feasibility, viability, and potential impact of a new idea, technology, or innovation.
R&I activities aim to generate proof of concept to assess the practicality and marketability of research outcomes, attract investment, and facilitate technology transfer and commercialization, driving innovation and entrepreneurship in VET and related sectors.

Intervention
Innovative strategies, programs, or interventions designed to address specific challenges, improve outcomes, or promote positive changes in VET practices, policies, or systems.
R&I activities involve evaluating the effectiveness and impact of interventions through rigorous evaluation methods, such as randomized controlled trials, quasi-experimental designs, and mixed-methods approaches, to inform evidence-based decision-making and continuous improvement in VET provision.

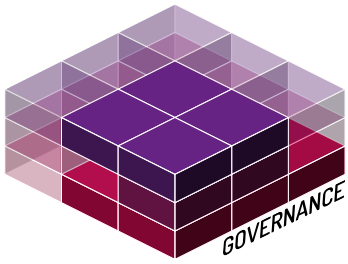


Image 27: Dimension 4, Governance, Areas and Elements

4.4 Dimension 4: Governance

This Dimension includes GOVERNANCE and organisational management, entailing strategies to conduct R&I and to create awareness around the main barriers and enablers that will be encountered. It also includes the open innovation ecosystem.
This dimension is important to enable VET centres to gain a clear picture of the way R&I can be be organised, before embedding it into their organisation's strategy, mission and vision, and to connect to existing legislation.

Areas and Elements concerning GOVERNANCE that need be taken into account are:

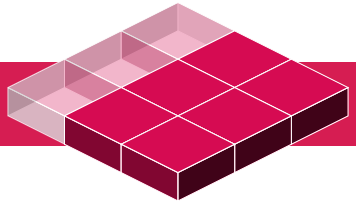


Image 28: Strategies of R&I

Area: Strategies of R&I

Solid (core) team
A dedicated and cohesive group of individuals within the VET institution responsible for leading and driving research and innovation (R&I) activities forward.
This team typically consists of experts from various disciplines, including educators, researchers, project managers, and administrative staff, who collaborate closely to define goals, allocate resources, coordinate efforts, and ensure the successful implementation and impact of R&I initiatives.

Integration of R&I (methodology/project) into the VET institutions strategy
The deliberate incorporation of research and innovation (R&I) principles, methodologies, and projects into the overarching strategic goals, priorities, and operations of the VET institution.
This integration ensures that R&I activities align with the institution's mission, vision, and values, contributing to its long-term sustainability, competitiveness, and relevance in addressing emerging challenges, advancing knowledge, and meeting the needs of stakeholders and society.

Scope: core competences, definition of the catalogue of the projects that the VET centre can achieve
The systematic process of identifying, categorizing, and prioritizing potential research and innovation (R&I) projects that align with the VET centre's capabilities, resources, expertise, and strategic objectives.
This catalogue serves for decision-making, resource allocation, and project management, enabling the VET centre to focus on high-impact R&I initiatives that contribute to its mission, address societal needs, and enhance its reputation and competitiveness.

Stakeholder engagement: raising awareness and promoting of students/teachers to get involved in R&I

Activities aimed at informing, motivating, and engaging students and teachers in research and innovation (R&I) activities within the VET institution.

This involves raising awareness about the benefits and opportunities of R&I, providing information about available resources, training programs, and support services, and fostering a culture of curiosity, creativity, and collaboration to inspire active participation and contribution to R&I endeavours.

Recruitment: hire people to conduct R&I within the VET centre

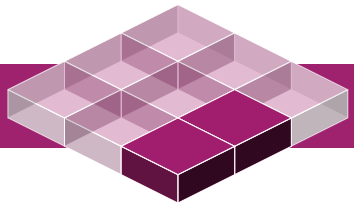
The recruitment and employment of qualified professionals, researchers, and experts to lead and conduct research and innovation (R&I) activities within the VET institution.

This includes hiring individuals with specialized skills, knowledge, and experience in relevant fields, such as research methodology, project management, data analysis, and technology development, to enhance the institution's R&I capacity, expertise, and impact.

Partner relations: generate and improve relations with stakeholders and companies

Efforts to cultivate and strengthen partnerships, collaborations, and networks with external stakeholders, including industry partners, companies, government agencies, research institutes, and community organisations, to support research and innovation (R&I) activities within the VET institution.

This involves establishing trust, mutual understanding, and shared goals, facilitating knowledge exchange, resource sharing, and collaboration, and leveraging complementary expertise, resources, and networks to address common challenges, seize opportunities, and create value for all parties involved.



Area: Internal barriers and enablers

Image 29: Internal barriers and enablers

Sufficient internal resources

The availability of adequate and appropriate internal resources within the VET institution to support research and innovation (R&I) activities effectively.

This includes the expertise, skills, and know-how of teaching staff and researchers, access to state-of-the-art equipment, facilities, and infrastructure, as well as administrative support, funding, and institutional commitment, necessary to foster a conducive environment for R&I excellence, creativity, and impact.

Ownership: a sense of responsibility towards the R&I project

A shared commitment and accountability among stakeholders within the VET institution to uphold the integrity, quality, and ethical standards of research and innovation (R&I) projects and initiatives.

This involves demonstrating professionalism, transparency, and diligence in conducting R&I activities, adhering to relevant regulations, guidelines, and best practices, and ensuring that R&I outcomes contribute to the advancement of knowledge, societal well-being, and organisational goals.

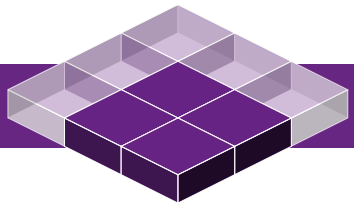


Image 30: External barriers and enablers

Sufficient available funding

Adequate financial resources and funding mechanisms to support the planning, execution, and sustainability of research and innovation (R&I) projects within the VET institution.

This includes securing grants, sponsorships, and investments from international, national, regional, and/or local government agencies, industry partners, philanthropic organisations, and other funding sources, as well as optimizing resource allocation, budget management, and fundraising efforts to maximize the impact and value of R&I initiatives.

R&I enabling policies – internal and external

Institutional policies, regulations, and guidelines that facilitate and support the conduct, management, and dissemination of research and innovation (R&I) activities within the VET institution.

This includes internal policies related to intellectual property rights, ethics review, conflict of interest, data management, and research integrity, as well as external policies and regulatory frameworks governing funding, accreditation, licensing, and collaboration, which create an enabling environment for R&I excellence, accountability, and compliance.

Enabling governmental strategies

National or regional strategies, initiatives, and policies implemented by government authorities to promote and support research and innovation (R&I) activities within the VET sector.

This includes funding programs, tax incentives, regulatory reforms, education and training policies, and innovation ecosystems designed to stimulate investment, collaboration, and entrepreneurship, foster knowledge creation and diffusion, and enhance the competitiveness and sustainability of the VET system and its contributions to economic and social development.

Good coordination among stakeholders

Effective communication, collaboration, and coordination between industry partners, small and medium-sized enterprises (SMEs), educational departments, and VET institutions, to support research and innovation (R&I) initiatives and achieve common goals.

This involves establishing clear roles, responsibilities, and communication channels, fostering trust, mutual respect, and shared ownership, and promoting open dialogue, information sharing, and alignment of interests and priorities to enhance synergy, efficiency, and impact in R&I partnerships and collaborations.

5. CONCLUSION

The four Dimensions, including their various Areas and Elements, collectively form a valuable Framework for Research and Innovation within VET. This Framework is not a rigid set of rules but a flexible guide that organisations can adapt to their unique contexts, allowing them to design their own approach after self-reflection.

This makes the Framework of great value for VET centres who are willing to start up / scale up their Research and Innovation activities and are in need of some direction.

Process from Framework to Roadmap
This Framework will be used to develop a Self-Assessment Tool, designed to tailor the model to each institution's unique characteristics and aspirations, acknowledging that one size does not fit all.

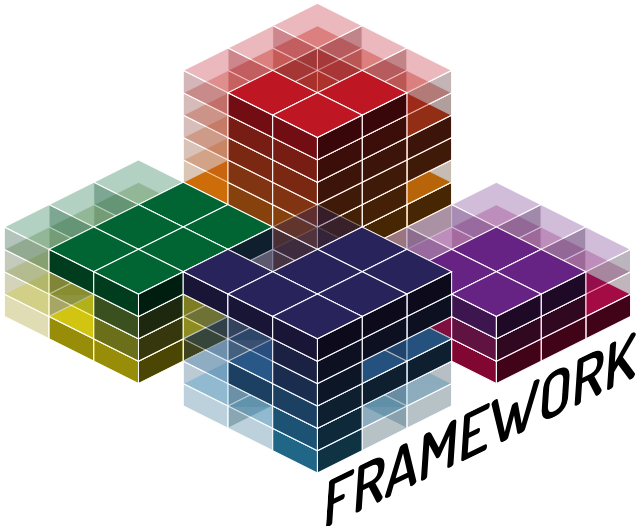


Image 01: The AIRinVET Framework

In the field of organisation science this is described as making the solution contingent with the situation. Among others, Mintzberg has given attention to the topic of contingency in his book The Structuring of Organizations (1979).

How this can be done well, will be highlighted in our next report, about the AIRinVET Roadmap. In this report we will also dive into the development of a strategic plan for implementing and evolving R&I activities, including relevant tools, recommendations and sources of inspiration.

AIRinVET Framework > Self-assessment > Roadmap, tools

Each VET centre embarking on this transformative journey can approach these changes holistically or select specific dimensions to enhance, depending on their unique circumstances and strategic goals. This modularity ensures that every institution can find value and direction within the AIRinVET framework, tailored to their needs and developmental stage. Including change management principles ensures a smooth transition, fostering a culture of continuous improvement and innovation.

The principle of "one size does not fit all" highlights the importance of flexibility. If an institution has effective existing practices, they can certainly continue using them. Our framework encompasses diverse strategies and contexts observed from numerous projects and organisations, distilled into four key dimensions. If an institution's approach differs, they can integrate elements from our framework to enhance their strategies. Our guidelines, discussion tools, strategy-defining aids, and awareness-raising documents are meant to support dialogue and foster a common language, also for interaction with governmental bodies.

Adopting a holistic approach also means there is no prescribed order for addressing various elements; institutions should prioritize based on their current needs. Institutions should focus on the most critical elements for their current needs without adhering to a fixed sequence. Our framework is not intended to necessitate a complete rewrite of existing strategies but to provide elements that can be integrated into their own Research and Innovation (R&I) initiatives. It is an open-ended, non-exhaustive list of elements that can be continually expanded and adapted.

Impact
The model consists of a standard set of elements that are important for VET centres to have an impact in R&I at local and regional level, mostly by helping SMEs in developing or implementing new products or processes.

Next steps: the AIRinVET Roadmap

The AIRinVET Framework shall be used as a blueprint in order to create a usable Roadmap for VET institutions. Each and every one of the individual institutions has its own strategies and goals. While reading the framework and accompanying tools, it is necessary to define the individual needs of the VET center. The framework should support this mapping and decision process. Based on the Framework, a Self-Assessment Tool will be introduced in order to allow VET institutions to start up / scale up their R&I activities in cooperation with SMEs in their region and will give them insight in their current state of affairs. Based on those insights, they will be offered **tools**, **recommendations** and **inspiration** to improve their R&I.

This way, the VET institutions can work on adapting it to their own organisation, tailoring the model to each institution's unique characteristics and aspirations, recognizing that one size does not fit all.

By following the three-step process, VET centres can transition smoothly from framework to roadmap, ensuring that their approach to research and innovation is continuously refined and remains relevant in the face of evolving educational landscapes.

The next step within our project will be the development of a strategic plan for implementing and evolving R&I activities, as outlined in the "Roadmap for Applied Research in VET," including relevant tools, recommendations, and sources of inspiration.

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