AIR IN VET

Applied Innovation and Research in Vocational Education and Training

D3.2 SMES ENGAGEMENT & AR MINDSETS REPORT

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PUBLISHABLE EXECUTIVE SUMMARY

Deliverable D3.2 of the Applied Research and Innovation in Vocational Education and Training (AIRinVET) project presents a comprehensive analysis of research and innovation (R&I) engagement within the European Union's Vocational Education and Training (VET) centres and Small to Medium Enterprises (SMEs). The report addresses three primary objectives:

1. Evaluating the current landscape of applied research and innovation from the perspectives of both VET and SMEs.
2. Identifying key elements and barriers for applied research and innovation activities.
3. Proposing practical tools and training materials to foster an applied research mindset.

Drawing from these objectives, it unveils successful models, pinpoints challenges, and proposes actionable resources to instil AR&I mindsets among VET management and educators. This report offers insights into the dynamic interplay between VET centres, SMEs, and innovation. It is intended to serve as a strategic guide for stakeholders seeking to cultivate a culture of innovation within the evolving landscape of vocational education.

LIST OF ACRONYMS AND ABBREVIATIONS

AR&I:	Applied Research and Innovation
AIRinVET:	Applied Research and Innovation in Vocational Education and Training
AR&I-SME:	Small to Medium-sized Enterprise engaged in Applied Research activities
CCI:	College and Community Innovation
CCTT:	Centres Collégiaux de Transfert de Technologie
CFI:	Canadian Foundation for Innovation
CoVE:	Centre of Vocational Excellence
CVET:	Continuous Vocational Education and Training
EU:	European Union
FE:	Further Education
ICT:	Information and Communication Technology
MoNE:	Ministry of National Education of Türkiye
NFBS:	Non-Financial Business Sector
Non-AR&I-SME:	Small to Medium-sized Enterprise not engaged in Applied Research activities
NSERC:	Natural Sciences and Engineering Research Council of Canada
PET:	Professional Education and Training
PPPs:	Public-Private Partnerships
R&D:	Research and Development
R&I:	Research and Innovation
RTO:	Registered Training Organisations
SME:	Small to Medium-sized Enterprise
TACs:	Technology Access Centres
TAFE:	Technical and Further Education
TVET:	Technical and Vocational Education and Training
UAS:	Universities of Applied Sciences
VET:	Vocational Education and Training
VTAH:	Vocational-Technical Anatolian High schools
WP:	Work package

You may also consult the glossary that was produced as part of the project: www.airinvet.eu/tools/glossary/

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1. INTRODUCTION

In contemporary European vocational education and training landscapes, the imperative for applied research within VET centres and small and medium-sized enterprises is increasingly recognised as crucial for fostering innovation and competitiveness. However, the mapping research (link: www.airinvet.eu/outcomes/)undertaken in work package 2 of the AIRinVET project, unveiled difficulties in identifying many "applied research" activities in VET centres. A quote from the conclusion of the report summarises: "The mapping does not show a special relation between applied research and VET. It seems that there are some activities that can be labelled as applied research, but they tend to be somehow anecdotal, in the sense that they do not tend to be systematised. Most of the activities mapped are not applied research according to the OECD definition, but non-teaching and learning activities that have some impact on innovation systems (at the local level).

The AIRinVET project, through its various tasks and initiatives, undertakes a comprehensive assessment of the current state of applied research within VET centres and SMEs across the European Union and beyond. The acknowledgment of the potential for research and innovation endeavors conducted by VET centres for companies varies significantly across the European Union and appears to be in its early stages. At the outset of the AIRinVET project, a mapping study was conducted to understand the extent of applied research within VET centers.

One key finding is the difficulty in identifying applied research activities within VET centres. Despite efforts to map these activities, it must be noted that many of them do not fit the criteria for applied research as defined by the OECD. Instead, the activities identified as non-teaching seem to be more ad hoc and lacking in systematic organisation, while still contributing to innovation systems at the local level.

This suggests that while there may be some research and innovation activities happening within VET centres, they may not align with traditional definitions of applied research. Furthermore, there seems to be a lack of systematic approach or integration of these activities within the VET landscape. This finding underscores the need for further exploration and potentially the development of frameworks or mechanisms to better support and recognise applied research within VET centres. In this report we include non-teaching, knowledge generation and difussion activities within the scope of applied research and innovation activities.

The insights for this report are derived from several activities and methodologies, including desk research, surveys, and qualitative interviews. The data collection phase spanned from April to December 2023.

Through this report, we aim to provide stakeholders with valuable insights, actionable recommendations, and practical tools to propel the symbiosis between applied research, VET centres, and SMEs, thus fostering a culture of innovation within the vocational education landscape.

In summary, the overarching goal of this report is threefold:

1. **Evaluation of the current landscape:** Delve into the existing scenario of applied research within the realms of VET centres and SMEs. This involves a thorough examination of the level of engagement, identifying successful models, and understanding the barriers that hinder fruitful collaborations.

2. **Identification of key elements and barriers:** Uncover the critical elements that contribute to successful engagement in applied research while simultaneously analysing the barriers that impede the collaborative efforts between VET centres and SMEs. This holistic understanding is pivotal for formulating targeted strategies.

3. **Proposal of tools and training materials:** Propose practical tools and training materials designed to cultivate applied research mindsets and skills among VET management and teachers. By leveraging insights from the project tasks, we aim to provide actionable resources that empower educators and managers to foster innovation activities by VET.

The different tasks undertaken that lead to this report were the following:

Task 3.1 – AIRinVET curriculum template:

- Creation of an AIRinVET curriculum template to assure a consistence in all the training materials created within the project. The template includes the main relevant sections of the curriculum, objectives, targets, learning outcomes, contents, technologies, learning methodologies, and delivery mechanisms. The template will be used for all training material elaborated in the interventions of WP5.

Task 3.2 – Engagement of SMEs:

- Report on SMEs engagement in applied research in VET: A comprehensive analysis of SMEs' involvement in AR&I within the VET context, shedding light on successful cases and on areas for improvement.
- Development of a decision tree for applied research by SMEs with VET centres: An innovative tool crafted to guide decision-making processes related to AR&I within VET by SMEs, offering a structured approach for effective engagement.

Task 3.3 – Engagement of VET Centres:

- Report on VET engagement in AR&I: An in-depth exploration of the engagement levels of VET centres in applied research, with a focus on best practices and challenges faced.
- Evaluation of the training for VET teachers and managers: A critical assessment of existing training programs for VET teachers and managers, aiming to identify gaps and propose enhancements.

Task 3.4 – Barriers for AR:

- Identifying the main barriers from the perspective of different target groups (VET, policy level, SMEs) when establishing AR&I systems in VET centres.
- Listing measures that could be adopted to overcome those barriers.

Task 3.5 – Mindsets for AR:

- Presentation of training materials: Collection and presentation of data on mindsets for applied research, offering a rich repository of training materials designed to foster an innovative mindset among VET management and educators.

This report is tailored to serve a diverse group of stakeholders including SMEs, VET providers, and policymakers. With a focus on providing actionable insights and practical recommendations, this report aims to empower SMEs and VET providers to deepen their engagement in applied research while informing policymakers about the necessary support mechanisms required to facilitate this collaboration. Additionally, this report is open to the public, ensuring transparency and accessibility to all interested parties.

Besides this report, six engagement videos directed at VET centres and SMEs and targeted to the regional audiences of the Basque country, Germany and the Netherlands, have been produced. They can be viewed on the project website from March 2024: www.airinvet.eu.

2. ENGAGEMENT OF SMES

The following chapter gives insights about SME' engagement in the realm of applied research and innovation with VET centres. The goals are to identify the key elements driving SMEs engagement in AR&I, to find out how they perceive vocational education and training centres, and their motivations to work (or not) with VET centres on non-teaching, knowledge generation or difussion activities.

2.1 Methodology

A threefold methodology was employed to learn about the engagement of SMEs in applied research and innovation with VET centres:

1. Desk research
2. A quantitative survey within the AIRinVET project among SMEs
3. Using data from a previously conducted survey with SMEs within Tknika's programme TKgune[1]

This combination of methodologies forms a robust framework for comprehensively understanding the perspective of SMEs on AR&I and their willingness to engage with VET centres. By analysing the collected data, the consortium aims to propose tailored recommendations and concrete measures to increase SME participation in AR&I projects with VET centres,

2.1.1 Desk research

Existing literature and resources on applied research and innovation activities by SMEs with VET centres were scanned as part of the desk research. Although the main target is European SMEs, other countries, such as Australia and Canada, were included as case studies. Using non-European academic publications in the desk research is relevant because it provides further information on SME collaboration with VET centres on AR&I activities. The initial hurdle encountered during the desk research was the intricate nature of the wording and terminology associated with applied research. SME engagement in AR&I activities is not always explicitly articulated as such, making it imperative to navigate diverse terminologies and interpretations across sources. The lack of a standardised vocabulary led us to examine various publications and resources to uncover implicit references to SME and VET collaboration in applied research endeavours. We followed the defintions given in the report D2.1 Glossary, which was produced as part of the project and that you may consult online www.airinvet.eu/tools/glossary. Generally, there are not many academic publications specifically on that topic. They provide little information on why SMEs engage or not in applied research activities with VET centres. . Despite the challenges encountered during the desk research, navigating between the diverse terminologies, perspectives, and definitions proved instrumental in capturing a holistic understanding of SME engagement in AR&I activities with VET centres. The diverse range of sources contributed to a nuanced exploration, enriching the findings, and laying the groundwork for the subsequent survey phase.

2.1.2 AIRinVET Survey for SMEs

A quantitative survey was developed and spread from September to November 2023 to SMEs through the network of all the project partners and their associated partners. The aim was to investigate SME engagement in AR&I activities with VET centres in European countries. The survey was designed with the tool "SurveyMonkey" in English, Dutch, German, and Spanish to make it accessible to a diverse respondent base. This multilingual survey employs a piped-logic approach, ensuring a systematic and respondent-friendly progression through the questionnaire. It integrated insights from prior Work Package 2 mapping activities. It encompassed a range of crucial aspects, including demographic data, sector categorisation, previous experience with applied innovation research, stakeholder involvement, existing collaborations with VET, and the overall perception of VET centres. The survey also delved into limitations and incentives influencing SMEs' decisions to engage in AR&I projects with VET centres. The network was chosen strategically to reflect a broad spectrum of SMEs engaged in applied research initiatives.

It was challenging to obtain responses from SMEs; only 15 participated in the survey. However, combined with the outcomes of the TKgune network, this survey provides invaluable insights into the nuanced dynamics of SME engagement with VET centres in AR&I activities. The findings not only affirm the multifaceted considerations influencing collaboration but also serve as a foundation for strategic recommendations to enhance the synergy between SMEs and VET centres in the realm of applied research and innovation.

The survey can be found in Appendix 1 or viewed online.

1. TKgune is a network formed by vocational training centres to facilitate the bi-directional transfer of knowledge between centres and companies

2.1.3 TKgune survey for SMEs

AIRinVET project coordinator, the Basque VET applied research centre Tknika, implemented the programme TKgune, which aims to develop innovation projects with companies to respond to the needs of scientific and technological updating of teachers, promoting innovation both in small and medium-sized enterprises and in VET centres (TKgune, 2021). TKgune created a survey for SMEs during a collaboration with a VET centre on AR&I projects in 2023. SMEs were asked to assess the quality of the work, the value for money, the deadlines, the communication, and the impact of the collaborative project. 50 SMEs took part in the survey, providing a robust data set and offering insights into the perspectives of entities spanning various sectors and demographic profiles.

The TKgune survey can be found in Appendix 2.

2.2 Results

2.2.1 Key findings from the desk research

Crucial economical role of SMEs
The consulted publications highlight the fundamental role played by SMEs in a country's economic growth. In the European Union, SMEs represent 99,8% of the enterprises, 64,4% of the employers, and 51,9% of the value added in the non-financial business sector (NFBS) in 2022 (Di Bella & al., 2023). Within SMEs, micro-SMEs form the highest number of enterprises (93,7%), the highest value added (36%), and the highest number of employees (45,8%). The EU countries with the largest share of micro-SMEs in the SME population in the NFBS in 2022 were Belgium, Cyprus, Czech Republic, France, Hungary, Poland, Portugal, Slovakia, and the Netherlands. SMEs are just as valuable for Australian economy. They create around 7 million jobs, contribute 57% of the Australian gross domestic product, and account for over 99,5% of all employing Australian businesses (TAFE Directors Australia, 2020). In Canada, 97,9% of the one million private companies in Canada are SMEs with under 100 employees (Berthiaume & al., 2023).

Given the crucial role by SMEs in the economy, applied research and innovation activities are essential for SMEs to remain competitive in the global market, to adapt rapidly to the changing market conditions, to improve overall productivity and efficiency and to foster partnerships with other stakeholders.

The need for innovation
SMEs face a variety of challenges in today's business environment – labour shortages, automatisation and digitalisation, rising costs for raw materials, rising inflations, supply chain disruptions and skills mismatch to name a few (Di Bella & al., 2023). In addition to long-term changes such as demographic change and climate change, acute crises such as the COVID-19 pandemic and the war in Ukraine have strained many SMEs in recent years. The challenges are manifold and complex and will not be elaborated on further here.

SMEs face constant changes and need to cope with an uncertain external environment, over which they have little influence (Arenhardt & al., 2018). There is consensus that SMEs must innovate to tackle economic, environmental, and social challenges (Victorian TAFE Association, 2018). This is essential to be competitive on national and global markets (Arenhardt & al., 2018). They need to adjust their business models, develop, adapt, or change their products, and create new forms of production through applied research (Di Bella & al., 2023). SMEs investing in research and development (R&D) also enjoy more growth and sustainability than those that do not (Berthiaume & al., 2023). It increases the value of companies and improves the productivity of an economy. The 2020 TAFE report highlights that "the capability to undertake practical research and apply it to the firm or industry is the key to success – for the firm, employees, and ultimately the economy." (TAFE Directors Australia, 2020, p.5). The Canadian example shows that undertaking AR&I activities in collaboration with VET centres benefits SMEs. Canadian SMEs proved to be more resilient and better at adapting to disruption when doing so. In 2017/2018, 4,400 new processes, products, prototypes, and services have been developed in Canada thanks to research activities in colleges and institutes. The EU expenditure on R&D increases year on year. In 2021, the EU spent €328 billion on R&D, 6% more than in 2020 (€310 billion) (European Commission, 2022). In 2022, the rate reached €352 billion, representing a 6,34% increase over 2021 (Eurostat, 2023b). However, R&D intensity in the EU, i.e. the R&D expenditure as a percentage of GDP is rising slowly in the EU. It only increased by 0,14% between 2012 and 2022, see figure 1:

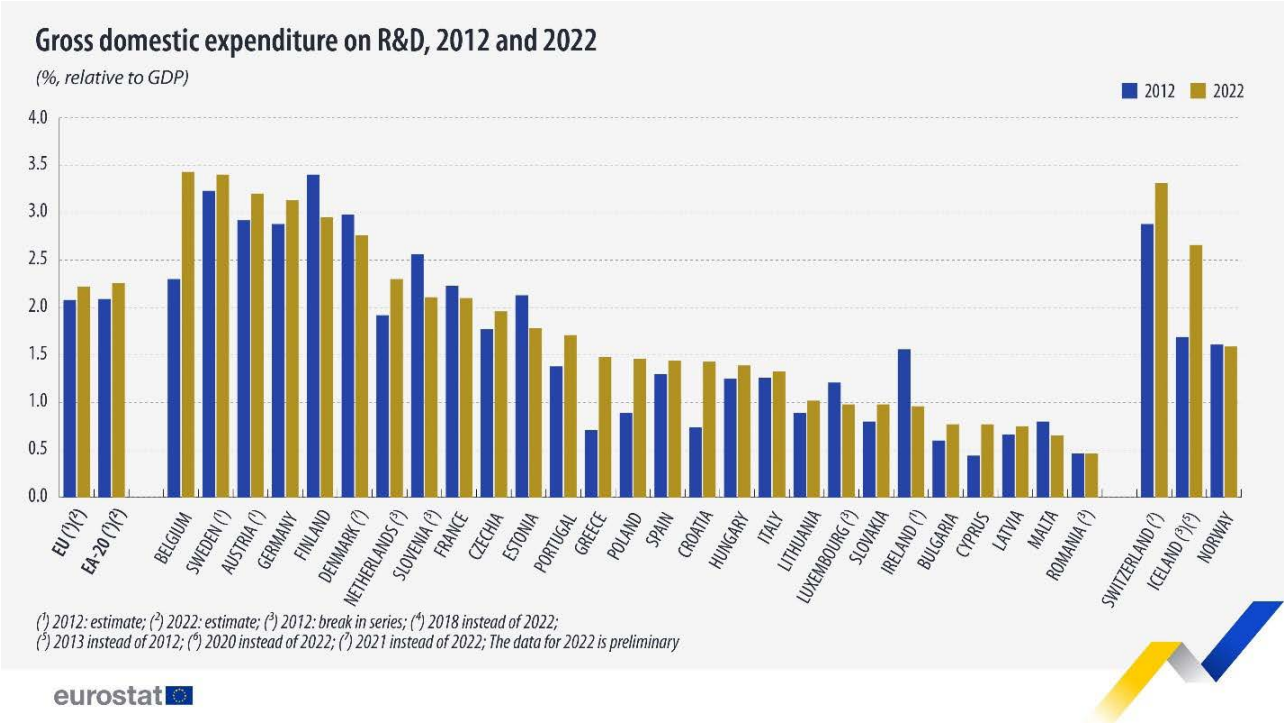

Figure 1. Gross Domestic expenditure on R&D, 2012 and 2022 [2]

It even fell in 8 EU member states: in Finland, Denmark, Slovenia, France, Estonia, Luxemburg, Ireland, Malta, and Norway.

SME engagement in applied research and innovation

Despite the benefits outlined above, European SMEs seem to have little interest in innovative practices (Arenhardt & al., 2018). They tend to innovate less than large enterprises, as shown by the Community Innovation Survey 2020, see figure 2:

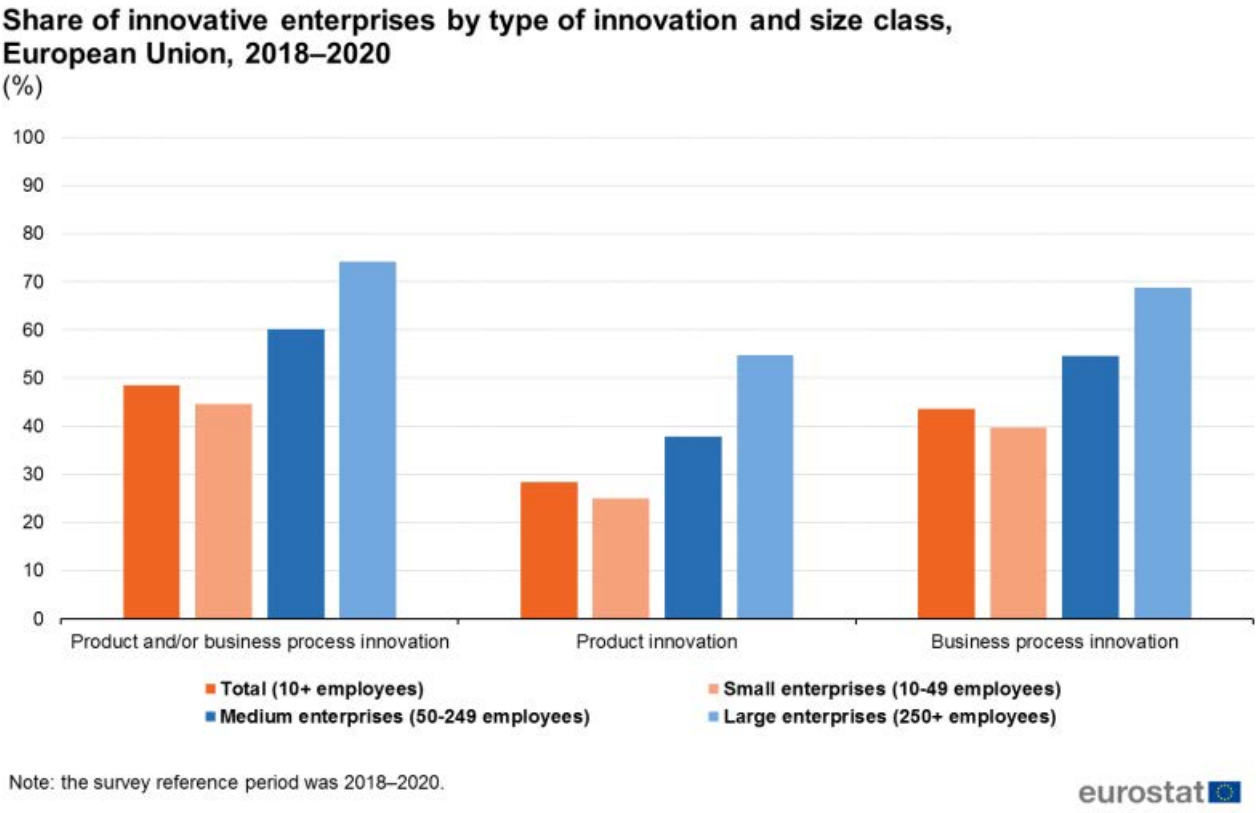

Figure 2. Share of innovative enterprises by type of innovation and size class, European Union, 2018-2020 [3]

2. https://ec.europa.eu/eurostat/web/products-eurostat-news/w/ddn-20231201-2
3. 111170.pdf (europa.eu)

SME engagement in AR&I activities is hampered by obstacles. Their ability to innovate is linked to the external environment, the structural factors, and their specific characteristics (Arenhardt & al., 2018). Desk research has shown that SMEs have limited resource and possibilities for internal development of knowledge and technology. A survey from 2022 on the access to finance of enterprises shows that EU-27 SMEs considered the availability of skilled staff or experienced managers and the costs of production or labour as quite important issues (Di Bella & al., 2023). In Canada, SME involvement in applied research used to be limited by their difficulty in acquiring or accessing the skills to innovate and the prohibitive costs of research and development (TAFE Directors Australia, 2020). Due to the lack of resources and the risks associated with applied research activities, SMEs tend to reduce their expenditure on research and development (TAFE Directors Australia, 2020). Such is the case of Australia, which has a weak industry research collaboration compared with international standards. In 2020, the industry financed only 5,1% of the expenditure on research and development of the higher education sector. The trend is similar in Canada, which had the weakest rate of private sector investment in research and development in the G7 in 2022 (Méthot & al., 2022). In the country, only 27% of R&D expenditures went to SMEs in 2022, although they represent 98% of Canadian companies. This figure has been declining in the past few years.

Another obstacle to SME involvement in applied research is the lack of recognition. Many innovation projects between technical and further education institutions (TAFE) and SMEs are unrecognised (TAFE Directors Australia, 2020). SMEs know little about the capacity of the applied research capacity of VET centres and tend to underutilise them (TAFE Directors Australia, 2020). SMEs are also not always ware of the importance of innovation. In the EU, countries with higher GDP per capita tend to be less aware of it than less developed countries (Arenhardt & al., 2018). According to the report, innovation has positive impacts on the performance of SMEs when they recognise its importance.

2.2.2 Key findings from the AIRinVET survey

General information

The first set of questions of the survey provides general information about the companies. The participants were asked about the company's size, customers, the sector or industry in which they operate, and their position within the company.

Participants' country and position within their company

Fifteen companies from four European countries participated in the questionnaire:

- 10 from Germany (Berlin, Mecklenburg-Vorpommern, Lower-Saxony, Saxony, and Schleswig-Holstein)
- 3 from the Netherlands (Friesland, Utrecht, and Zuid-Holland)
- 1 from Estonia (Tallinn)
- 1 from Poland (Gdynia)

Among the participants, 40% are company employees, 33.33% are company managers, and 20% are company owners. One participant from Germany is a VET advisor.

Company size

The companies surveyed generally have between 1 and 9 employees or between 10 and 49 employees. Only 20% are medium-sized companies with 50 to 250 employees. None of them have more than 250 employees, which confirms that the participants in the questionnaire are SMEs according to the European Commission's definition.[4]

Company sectors

The SMEs were asked about the sector or industry in which they operate, based on the European statistical classification of economic activities NACE Rev.2 (Eurostat, 2008). The results show that the companies surveyed are involved in various sectors:

- Construction (5 companies)
- Information and communication (3 companies)
- Agriculture, forestry, and fishing (2 companies)
- Arts, entertainment, and recreation (1 company)
- Education (1 company)
- Manufacturing (1 company)
- Professional, scientific, and technical activities (1 company)
- Other service activities (1 company)

4. https://single-market-economy.ec.europa.eu/smes/sme-definition_en

Company seniority

The last general question is about the company's seniority. The participants are well established, as 75% of them have been operating for 5 years or more. They also have different customers. 80% work for private customers, 53.33% for other companies and 33.33% for the government or a public administration.

SMEs' engagement in applied research and innovation activities

The second part of the questionnaire deals with the engagement of SMEs in applied research and innovation (AR&I) activities.

SMEs' engagement in applied research activities

The results show that it is not common for SMEs to be engaged in AR&I activities. 53.33% of the participants have not been involved in such activities yet. However, all the companies engaged in applied research and innovation activities describe their experience as "positive". One may wonder why not more SMEs engage in AR&I activities when it seems to benefit them. It is interesting to look at the profiles of the SMEs already involved in applied research and innovation activities, referred to here as "AR&I-SMEs" and compare them to the companies which have not been engaged in such activities called here "non-AR&I-SMEs".

Profile of the SMEs engaged in applied research activities

It is not possible to determine if there is a link between the country and the engagement of SMEs in applied research and innovation activities. The questionnaire does not show if it is more common in some countries. Germany is the most represented country in the questionnaire with 10 companies. Among the German participants, 50% carry out AR&I activities. This figure corresponds to the general trend, so we may assume the indicator "country" does not play a significant role in the SMEs' engagement in AR&I activities.

Among the participants already involved in AR&I activities, 4 are company employees, 2 are company managers, and 1 is advisor for VET. The questionnaire shows that company owners tend to be less engaged in applied research and innovation activities. They represent 20% of the participants, but none of them are involved in AR&I activities, see figure 3:

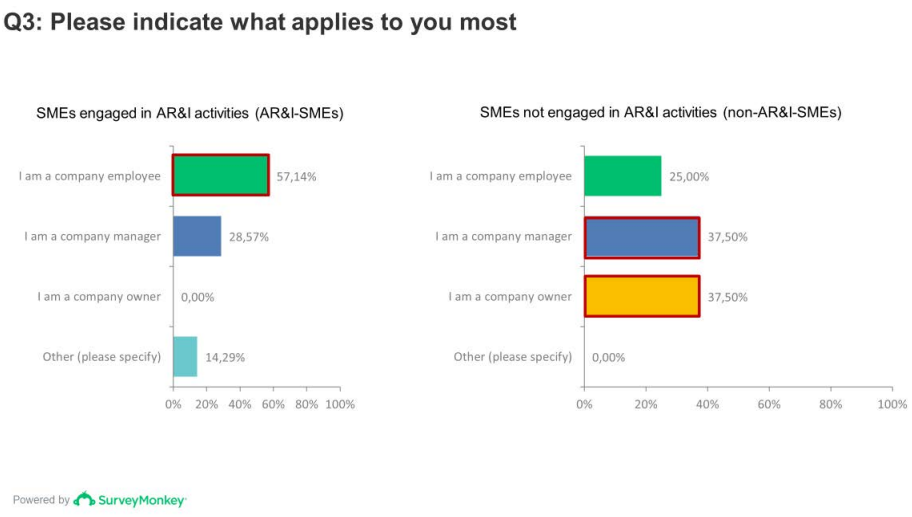

Figure 3. Position in SME

There are no significant differences in size between AR&I-SMEs and non-AR&I-SMEs. The companies engaged in AR&I activities are slightly larger on average, see figure 4:

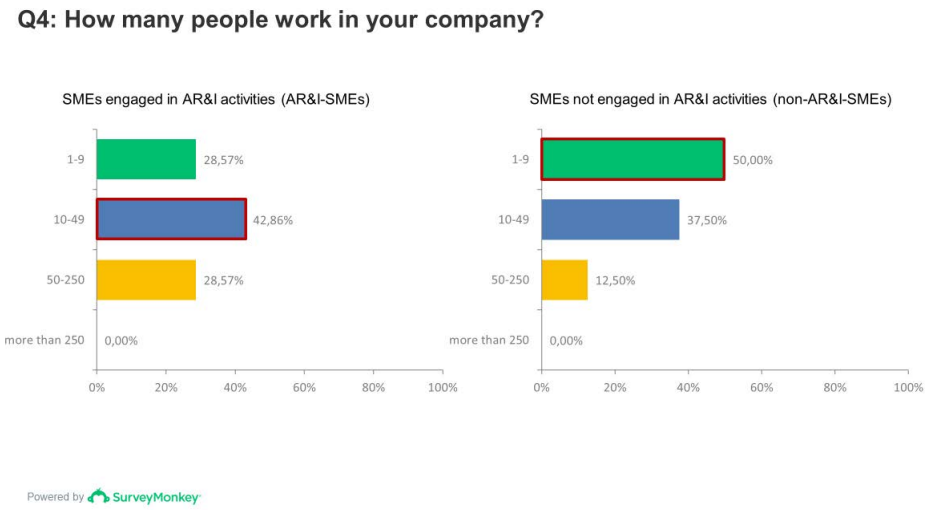

Figure 4. Number of employees in SMEs

Companies involved in applied research and innovation activities are mainly small or medium-sized enterprises, whereas half of those not engaged in AR&I activities are micro-enterprises.

Companies' engagement in AR&I activities does not seem to be related to their sector of activity. AR&I-SMEs and non-AR&I-SMEs are active in the same sectors. Interesting is that the SMEs engaged in AR&I activities are operating in various sectors such as agriculture and construction. The results show that AR&I activities attract SMEs from all sectors.

The AR&I-SMEs seem to be slightly more experienced than the non-AR&I-SMEs, see figure 5:

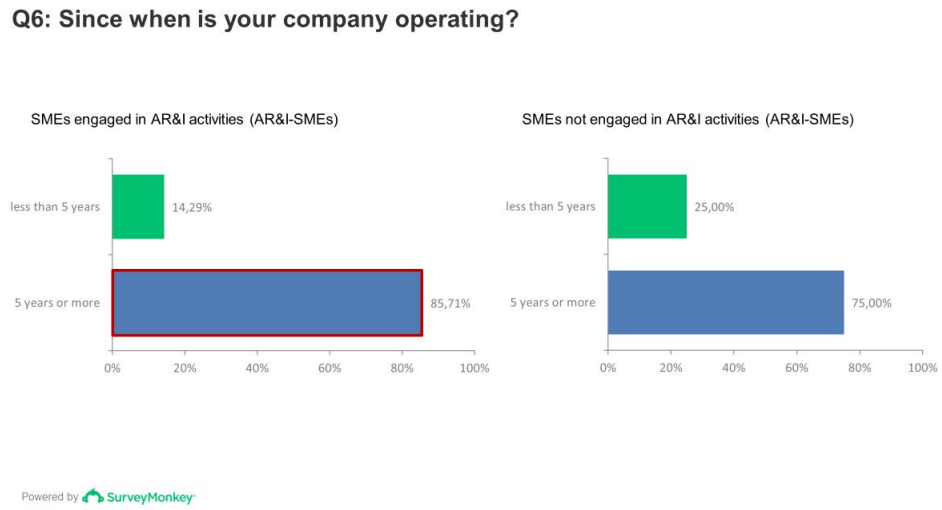

Figure 5. SME seniority

However, the questionnaire does not provide information on the exact number of years the company has been in business. The results do not allow us to establish whether a company's seniority plays a role in its involvement in AR&I activities.

The questionnaire reveals an interesting difference in the type of customers. If AR&I-SMEs and non-AR&I-SMEs both have private customers as main customers, the AR&I-SMEs work much more with the public sector, see figure 6:

Q7: Who are the main customers of your company (multiple answers possible)

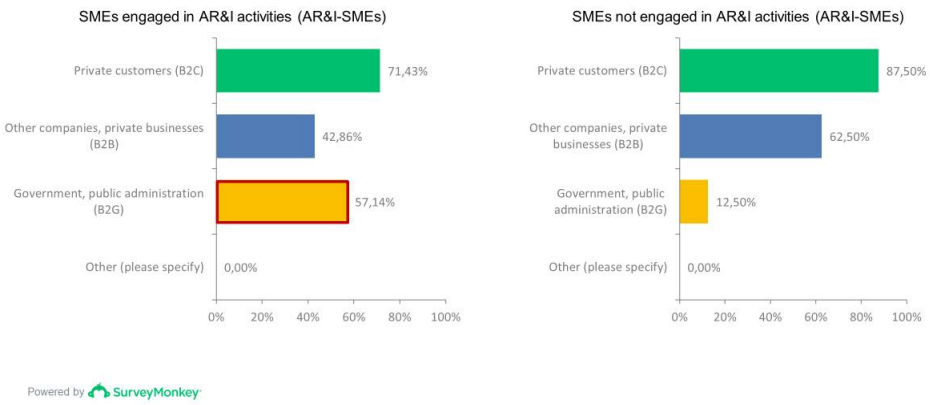

Figure 6. Main SME customers

57.14% of them indicate that their main customers are the government and public administrations, against 12.50% of the non-AR&I-SMEs. The results show that SMEs working with the public sector are more likely to take part in applied research and innovation activities. This aspect could be further investigated in future studies.

One may wonder why SMEs engage in applied and research activities and how they do it. The questionnaire ask the SMEs already engaged in AR&I activities about the outputs and tangible solutions developed, their partnerships with other institutions, their funding, and their overall experience.

Type of applied research and innovation activities undertaken by SMEs

The companies already engaged in AR&I activities are mainly involved in product development (60%) and process optimisation (60%). They also work on technology advancement (50%) and market analysis (20%). The outputs and tangible solutions developed are well-defined. 40% of the SMEs surveyed developed new product prototypes, market reports, and insights or improved software algorithms as part of their AR&I activities. One company indicated having worked on energy saving in production. Streamlined production processes and program impact assessments are not among the outputs and tangible solutions developed by the SMEs surveyed. The results nevertheless demonstrate the diversity of the outcomes of AR&I activities.

Type of funding for applied research activities undertaken by SMEs

SMEs have access to different funding sources to finance their AR&I activities:

- 60% use government grants
- 40% use research partnerships
- 40% use internal funding

The results show that SMEs do not necessarily have to use internal funding to engage in applied research and innovation activities. It means a lack of financial resources is not an obstacle to SME involvement in AR&I activities.

SMEs' partners in applied research and innovation activities

Many stakeholders are involved in the AR&I activities developed by SMEs:

- 80% are internal company teams/departments
- 40% are external industry experts/consultants
- 40% are government agencies
- 40% are academic researchers
- 20% are end-users or customers

However, none of the SMEs surveyed work with students on AR&I activities. Indeed, educational institutions do not appear to be a traditional partner of the companies. 60% of them have never collaborated with any educational institutions on applied research or innovation projects, whether colleges or vocational education schools. Among the few SMEs which did, they only worked with institutions of higher education; 50% with a university, 50% with a University of Applied Sciences. According to the results of this questionnaire,

SMEs do not work at all with VET centres. The questions afterwards about how SMEs perceive VET centres need to be answered by more companies to get meaningful data.

Determining factors in the success of applied research activities

Companies were asked to rate their overall collaboration experience with educational institutions and the key enablers that can contribute to a successful applied research and innovation projects. It was positively experienced by one company, and moderately so by another. Both respondents consider that clear communication channels and complementary expertise and resources are important for a successful collaboration with VET centres. However, for one of the two companies, it is even more important to have effective project management, timely and reliable deliverables, and a strong commitment from both parties. Several aspects contributed to the success of their collaboration with VET centres: the alignment of goals and objectives, the regular progress monitoring and evaluation and the clear definition of roles and responsibilities have been "very important" for one company and "important" for the other. The two SMEs also consider that the open and collaborative culture and the adequate funding and resources have played an important role. As indicated earlier, there were too less respondents to get meaningful data. On the other hand, the responses we get are a good starting point for further investigation, wherein the responses can be used as hypotheses to be tested.

SMEs' motivations to collaborate with educational institutions on applied research and innovation activities

All participants were asked about their sources of motivations to engage in such projects with educational partners and the barriers perceived.

Barriers for SMEs to engage in applied research activities

Among the answers, only one comes from a company already engaged in AR&I projects with educational institutions. The results show that non-AR&I-SMEs perceive many challenges when it comes to cooperation with educational institutions. 85.17% of the "non-AR&I SMEs" think that the cultural differences between education institutions and industry are a barrier to their collaboration (57.14% "strongly agree", 28.59% "agree"). 71.43% agree that the benefits or relevance to company goals are unclear. The AR&I-SME also perceives these two factors as barriers but considers finding suitable educational institutions the most difficult in such projects ("strongly agree"). 42.86% of the non-AR&I-SMEs share this idea, but they generally deplore even more the lack of awareness about potential collaborations (85.72%). Administrative and contractual complexities, as well as intellectual property concerns, are rarely seen as obstacles to collaboration with educational institutions. The AR&I-SME and 71.43% of non-AR&I-SMEs do not consider intellectual property a challenge. None of the enterprises surveyed identify administrative and contractual complexities as an obstacle to working with educational institutions. Most SMEs have difficulties assessing the time and resources required to develop applied research and innovation activities with educational institutions.

SMEs' interest in collaborating with educational institution on applied research activities

The questionnaire then focused on the importance of specific conditions for companies to consider collaborating with an educational institution on applied research projects. The trend is similar for the AR&I-SMEs and the non-AR&I-SMEs. Most enterprises consider the alignment of research interests with company goals (87.50%) and strong support from top management (75%) to be important or very important factors. SMEs disagree on the importance of the funding or financial incentives and the opportunity to connect with future employees/recruiting talent. 37.50% described funding or financial incentives as "somewhat important", 25% as "neutral", 25% as "important", and 12.50% "very important". The trend is similar on the opportunity to connect with future employees/recruiting talent. However, most of them agree that access to specialised facilities or equipment (62.50%) and having clear guidelines for intellectual property rights (87.50%) are "somewhat important".

The SMEs engaged in applied research activities were then asked if they would consider collaborating with an educational institution on future applied research projects. Interestingly, the company which has had an average experience with educational institutions in AR&I projects answered "definitely", whereas the other company, which rated its experience as "good", answered "probably". The questionnaire does not provide information on the non-AR&I-SMEs' interest in collaborating with an educational institution.

Given that none of the SMEs surveyed has already collaborated with VET schools on applied research and innovation activities, it is interesting to know whether they plan to do so in the future. The responses are quite negative. Half of the participants feel that collaboration with VET schools is "not valuable or relevant", while the remaining half see it as "somewhat valuable but with limited potential". No company think it would be highly valuable and innovative for them. The SMEs will be inclined to work with VET schools if they gain:

- Opportunities for knowledge exchange and networking (62.50% "agree", 37,50% "strongly agree")
- Access to specialised knowledge and expertise (62.50% "agree", 25% "strongly agree")
- Potential for innovative solutions to business challenges (50% "agree", 25% "strongly agree")
- Enhanced reputation and visibility in the industry (62.50% "agree", 12.50% "strongly agree")

To a lesser extent, some are also interested in access to funding or grants for collaborative projects (25% "agree", 12.50% "strongly agree") and the access to equipment (12.50% "agree", 12.50% "strongly agree"). One participant cited the recruitment of staff as an additional source of motivation for his organisation.

The SMEs surveyed are open regarding the type of applied research and innovation activities they consider to undertake, see figure 7:

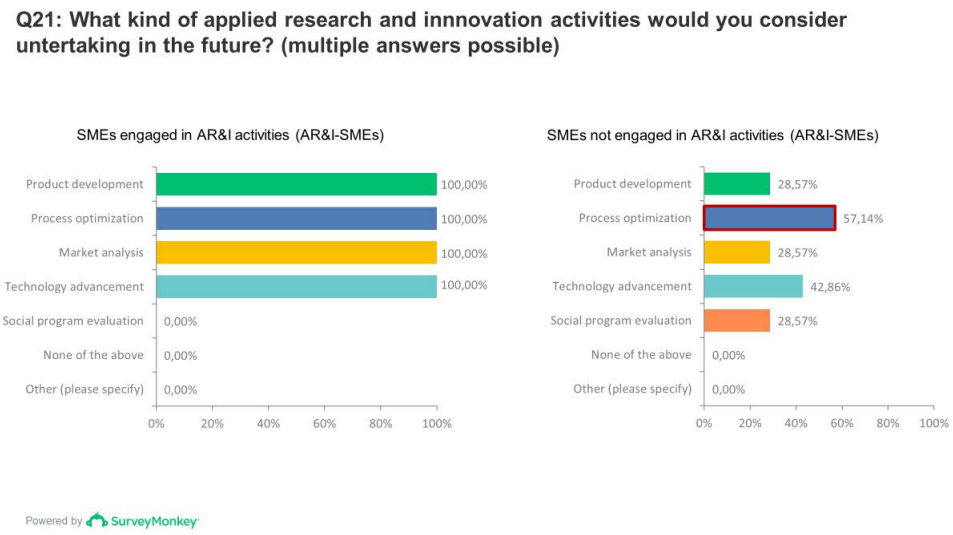

Figure 7. Type of applied research and innovation activities SMEs would consider undertaking in the future

The survey results show that SMEs have little collaboration with educational institutions, and even less with VET schools. According to the responses, it seems that SMEs do not know enough about educational institutions and what they can offer to their companies. The SMEs are open to collaboration with educational institutions but are little aware of the benefits they could gain from doing so. They also lack information on the good practices to adopt for a successful project. However, they provide concrete points in which educational institutions could support them (knowledge, innovation, and reputation).

2.2.3 Key findings from TKgune survey

1. **Timely delivery and accessibility:**
   - SMEs within the TKgune network emphasise the importance of timely delivery of services from VET centres, highlighting the significance of adherence to project timelines.
2. **Technical capacity of teachers and technicians:**
   - The technical capacity of VET teachers and technicians emerge as a critical factor influencing SME collaboration, underscoring the importance of expertise in driving successful applied research projects.
3. **Communication and interdisciplinary collaboration:**
   - Effective communication and the ability to bring together entities from diverse disciplines are essential to successful collaboration, emphasising the need for cohesive interdisciplinary efforts.
4. **Financial assistance and flexibility:**
   - Financial assistance, coupled with flexibility and the availability of resources, are noted as pivotal incentives, demonstrating that SMEs prioritise support mechanisms that alleviate economic burdens and enhance project adaptability.
5. **Attraction of students to the company:**
   - Collaborating with VET centres is viewed as an avenue to attract students to SMEs, providing a talent pool and fostering a symbiotic relationship between education and industry.
6. **Economic improvement and knowledge transfer:**
   - SMEs recognise the potential for economic improvement and knowledge transfer as key outcomes of engaging with VET centres, indicating a dual benefit for both parties involved.
7. **Access to resources:**
   - The collaboration is seen as an advantageous opportunity for companies with limited resources, aligning with broader goals of skill development and industry relevance.

Conclusion of the investigation on SME engagement in AR&I activities

Desk research, AIRinVET survey and TKgune survey show that SMEs engage little in applied research and innovation activities with VET centres, mainly due to lack of information and experience. However, the results clearly demonstrate the benefits of engaging in AR&I activities. The surveys identify sources of motivations for SMEs, providing insights on how to develop a research culture among SMEs.

2.3 Decision tree

A decision tree has been developed from the perspective of SMEs to clarify how AR&I with VET can take shape. This decision tree delineates various collaboration options between VET and SMEs, contingent upon the time commitment and motivation of the SMEs. It serves as a useful tool for both SMEs and VET centres seeking insights into collaborative opportunities in applied research. The decision tree centres on the SME's perspective, and comprises three sequential steps, described below.

Step 1: The starting point of the decision tree commences with the inquiry 'How much time and resources does the company have available?'.

Step 2: Subsequently, the next step involves examining the SME's underlying motives for engaging in collaboration, drawing insights from interviews conducted and analysed in the final mapping report (WP2).

Step 3: The third step aims to showcase the various forms of collaboration in VET available to the SME. Additionally, real-life examples out of the case studies (WP2) illustrate these different forms of collaboration. Some of these examples align with the definition of applied research as outlined in the project report D2.1 glossary.

The decision tree can be found in Appendix 3, and on the AIRinVET website.

3. ENGAGEMENT OF VET/HVET

In the following chapter, we identify and describe the key elements that make AR&I approach acceptable for VET/HVET centres in different regions. As the involvedness of VET centres varies among regions and even among VET centres, the aim is to learn the motivations that incentive the inclusion of AR&I activities within the centre's strategies in the country regions.

This chapter consist of 2 main parts:

3.2 **Report on VET engagement for AR&I in VET** based on the collected data., which will be classified and processed by regions, VET centre size, and sectors. As a result, the consortium will propose recommendations and potential measures for VET centres to increase their involvedness in AR&I projects. The methodology is described in chapter 3.1, the results are in chapter 3.2

3.3 **Training for VET teachers and managers** on how to involve SMEs in AR&I in VET. These trainings aim to give teachers and managers tools to increase the awareness among SMEs about the possibilities of AR&I in VET. A description is given in chapter 3.3.

3.1 Methodology of the report

A fourfold methodology was employed to investigate VET engagement in applied research and innovation activities. Desk research, Orkestra's research project on TKgune, a survey, and interviews were used. VET organisations and associations at regional levels, as well as international VET associate partners in the project, were interviewed to ensure a representative sample of VET centres in each region to draw reliable conclusions. Different aspects of the mapping activities (WP2) were integrated in this process.

3.1.1 Desk research

Desk research was carried out based on the final mapping report (WP2) of the AIRinVET project. In this report, we clearly distinguish applied research on VET from applied research by VET. We focus on VET centres that carry out non-teaching and learning activities related to knowledge difussion or generation and play a role in a concrete innovation system. Our desk research is based on VET innovation being "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 in the introduction of improved products or processes (or combination thereof)" (as defined in the final mapping report (WP2) (p.14)). As with the desk research on SME engagement in AR&I, there are not many academic publications on applied research by VET.

The final mapping report (WP2) already provides an exhaustive overview of the applied research policy contexts of some countries (p. 27 to 37). In this section, we will briefly present the VET policies of the countries covered in the desk research, as they directly impact VET engagement in AR&I activities. The understanding of what constitutes VET varies significantly across different countries, and so does the definition of VET levels. While some countries (e.g. Germany) would classify Universities of Applied Sciences (UAS) within the VET spectrum, others distinguish them from traditional VET centres. This diversity of definitions required a nuanced approach to contextualise findings and ensure accurate interpretation. Although the report initially focuses on European VET centres, other countries, such as Australia and Canada, were included in desk research to have a global understanding of the variables influencing VET engagement in AR&I activities. Desk research shows there are many more publications on VET applied research in Australia and Canada than in European countries.

3.1.2 Orkestra's research project on TKgune

TKgune network consists of 46 VET centres, with between 5 and 6 teachers per vocational training centre involved in projects. VET teachers from the TKgune network were asked to respond to a collaborative project survey as part of a research project on the programme conducted by the Vice-Ministry of Vocational Training and Orkestra-Basque Institute of Competitiveness. The survey was designed in Basque and then translated into English for the AIRinVET project. The survey aimed to examine the benefits and impact of the TKgune programme for the various stakeholders. VET teachers and coordinators were asked about their itinerary and their experience within TKgune programme. The survey encompasses questions about the difficulties faced by VET centres and the key success factors of an AR&I project.

The survey can be found in the appendix Appendix 2.

3.1.3 AIRinVET Survey for VET

A quantitative survey was developed on "SurveyMonkey" based on the insights from prior in final mapping report (WP2). The aim was to complete and validate the desk research findings to understand better why VET centres do or do not engage in AR&I activities. The survey provides information on the characteristics of the VET centres surveyed, the importance of AR&I within their institution and the barriers encountered. Several survey questions are identical for VET centres and SMEs so that their responses can be compared. The survey was designed in English and then translated into Dutch, German, and Spanish to make it more accessible and easier for respondents to understand. It was spread to VET centres within the project partner and associated partner network. This multilingual survey employs a piped-logic approach, ensuring a systematic and respondent-friendly progression through the questionnaire.
The survey can be found in the Appendix 3 or viewed online.

3.1.4 Interviews

AIRinVET partners conducted fifty-two semi-structured interviews with VET centres from different countries between April and October 2023 as part of the in final mapping report (WP2). Nineteen countries are represented, out of which 13 located in Europe. These interviews provide information on AR&I activities in VET providers. The interviewees were asked about their organisation, i.e. its structure and activities, value proposition, research methods and methods assessment. The outputs, resources, organisation context and policies, funding structure and revenue streams, as well as the engagement of SMEs/communities, were also covered. This chapter focusses on the last part of the interview, i.e. on context and policies, funding and revenue streams as well as the engagement of SMEs/communities. The interviewees spoke about their barriers and motivations to engage in AR&I activities with companies. These interviews provide concrete examples of why VET centres do or do not engage in such activities.
The AIRinVET interviewer guideline and the list of institutions interviewed can be found in the "D2.2 Publication on AR actors, business models and case studies" available on the AIRinVET project website.

3.2 Results

3.2.1 Key findings from desk research

Desk research gives valuable insights about the VET systems and AR&I policies in different countries. It also provides information on the challenges faced by VET centres in carrying out applied research and innovation activities and suggests recommendations to develop an AR&I culture within their institution.

VET systems and applied research policies by country

Innovation in VET has developed in the past years. In 2019, 29% of the innovative practices undertaken by TVET were products/services, 26% were ecosystem/external relations, 26% were processes, and 19% were organisational practices (Ganter de Otero, 2019). However, the VET learning models, and policy frameworks differ depending on the country (European Training Foundation, 2023). Some countries have a dual model like Germany, some an education-led model like France, and others a market model of education like the UK (The future of vocational education, 2023). Governance structure is also very different from one country to another, with some being centralised while others are decentralised. While the report aims to explore the AR&I landscape in the European Union, sources and case studies beyond Europe are highlighted.

Spain has been a highly decentralised country with 17 autonomous communities since the adoption of the Spanish Constitution of 1978 (Moso-Diez & al., 2022). Spain's autonomous communities differ in demography, population, economy, labour market, sectors, business, society and culture. They also have different VET systems adapted to their local needs and environment, as the Spanish VET system is implemented at the regional level, even though it is designed institutionally and legislatively at the state level. Spain offers intermediate and higher levels of vocational education and basic VET programmes for early school leavers (European Training Foundation, 2023). Higher VET consists of a two-year associate degree program focused on rapid integration into the labour market. Spanish VET splits into two subsystems (Moso-Diez & al., 2022). Initial VET is formulated and implemented at the regional level, whereas continuous VET (CVET) comes under the central government authority.

In line with the Spanish governance structure, applied research in vocational education is framed by national and regional policies (European Training Foundation, 2023). In 2022, the Spanish government adopted a law on the organisation and integration of vocational education and training to "incorporate innovation, applied research, digitalisation, sustainability, and entrepreneurship into all VET programmes" (European Training Foundation, 2023, p.20). At regional level, VET applied research and innovation policies are also implemented. Basque Country, for example, has developed the Basque Vocational Education and Training Plan, which tackles new challenges in society. The region also adopted its own VET law in 2018 to expand the objectives of vocational education and change the role of VET institutes. The goal is to make applied innovation and entrepreneurship a central part of the Basque vocational education system. Under this law, teachers must get involved in applied innovation. The Department of Education of the Basque Government established the institute and expertise centre Tknika, which is recognised as a Centre of Vocational Excellence (CoVE). This centre aims

to "strengthen vocational education through innovation, creativity and entrepreneurship" (European Training Foundation, 2023, p.6). Around 200 projects are carried out each year as part of TKgune programme. Tknika has developed an applied research methodology for the programme beneficiaries. Most companies involved in TKgune projects are SMEs. Unlike in Canada, students are not directly involved in applied research projects with companies. The quality of the projects is a priority, as SMEs involved pay for the services of VET centres to improve their competitiveness. Moreover, the law prohibits VET centres from charging money for students' work. However, students gain knowledge and insights into the project thanks to the knowledge transfer from their teachers, which is an integral part of Tknika's applied research methodology. The TKgune programme involved 300 teachers from 45 VET centres working on applied research and innovation projects of over 3000 companies in 2022. In response to the Basque VET law, the Spanish Ministry of Education created CoVEs within Spain. Each autonomous community designates its member VET centres.

Applied research is mainly funded through ad hoc funding in Spain, i.e. grants, prizes, and pilot projects from local and governmental educational institutions, but is also eligible for Erasmus+ funding. The 2021-2027 Erasmus+ program has a budget of 400 million euro to set up "Partnerships for Excellence". In 2021, Spain was involved in 9 out of 13 projects supported.

Germany is a leader in translating research into new technology (Beddie & Simon, 2017b). The country has a well-established dual system of vocational education and training, that distinguishes from its higher education/university system (Edwards & Hazelkorn, 2019). The German system combines practice and theory in VET and produces STEM graduates from its higher education system (Beddie & Simon, 2017b). Universities of applied sciences (Fachhochschulen) dedicated to applied research have been created, mainly in technological fields (Victorian TAFE Association, 2018). Seventy-two institutes and research units throughout Germany collaborate on applied research projects within the Fraunhofer-Gesellschaft. This organisation is financed by public and private funds. More than 150 highly successful spin-off companies have been created thanks to this investment.

In **the Netherlands**, the education policy is decentralised (European Training Foundation, 2023). Schools set general quality standards, provide funding and are "responsible for their curricula and are free to decide how to spend available resources" (European Training Foundation, 2023, p.24). The Netherlands is a leader in vocational education, with many colleges engaged in integrated, practice-oriented research (Packer, 2022). The country offers intermediate and higher levels of vocational education and basic VET programmes (European Training Foundation, 2023). Higher VET consists of a two-year associate degree program focused on rapid integration into the labour market. In the Netherlands, "basic VET (MBO levels 2 and 3) is seen as more practically oriented programmes open to a broader group of learners" (European Training Foundation, 2023, p.59). The Netherlands also provides so-called professional VET (or higher professional education) accredited at EQF level 6 within University of Applied Sciences (UAS).

In the Netherlands, applied research follows a bottom-up approach. The Dutch government has invested in applied learning and applied research services for industry by creating universities of applied sciences (UAS) (Victorian TAFE Association, 2018). UAS are a key player in the Dutch innovation system and has already involved around 4600 companies since the project began. Since 2000, the Netherlands has taken various measures to develop research capability at the UAS (Beddie & Simon, 2017b). New staff positions called 'lectors' were created to increase knowledge, professionalise staff, renew educational programs, and facilitate knowledge circulation from and to the economy and society. Knowledge circulation grants "were designed to improve knowledge development and exchange between the universities of applied sciences and industry (from 2005), and also between these universities and public sector organisations (from 2006)" (Beddie & Simon, 2017b, p.28). It took time for these two measures to be adopted by all stakeholders, but research in universities of applied sciences is now an integral part of Dutch tertiary education.

Two other initiatives were launched in parallel: Practorates[5] and public-private partnerships (PPPs). Practorates are teams of multi-disciplinary teachers who come together in VET institutes to explore new professional practices through applied research. (European Training Foundation, 2023). Practorates tend to focus on improving the quality of education rather than stimulating innovation in the economic sectors. In 2022, the Dutch Ministry of Education has committed to invest 25 million yearly in practorates. 85 practorates of 44 VET institutes carry out active educational research or research in occupational domains. Public-private partnerships bring together businesses, regional/government bodies, and VET institutes. The 450 PPPs are part of the central network organisation and AIRinVET project partner Katapult[6], which supports them in all stages of development.

Applied research can be financed in several ways in the Netherlands. The Dutch government mainly supports applied research through ad hoc grants, but more and more are becoming structural. For example, the Regional Investment Fund was awarded 173 million euros for 2014-2021 and funded 84 PPPs. Beneficiaries of this fund must also invest their own funds in the project; the average contribution amounted to 100 000 euros for 2014-2021. The Dutch government also founded the National Growth Fund in 2020 to support projects promoting long-term economic growth. Thirty-five projects were allocated 24.8 billion euros for the period 2021-2025.

5. In English – Practoraten.nl
6. We are Katapult

In **Switzerland**, the Swiss vocational and professional education and training system is divided into Vocational education and training (VET) and Professional education and training (PET) (OECD/CERI, 2008). VET corresponds to the upper secondary level and leads to a Federal VET Certificate after two years or a Federal VET Diploma after three or four years. It is open to adults and allows young people to study for the Federal Vocational Baccalaureate after three or four years. PET corresponds to the tertiary level (type B) and "combines both practical skills and theoretical expertise in preparation for managerial functions" (OECD/CERI, 2008, p.5). Experienced professionals wishing to improve their knowledge can take examinations to obtain a federally recognised diploma, i.e. the Federal PET Diploma or the Advanced Federal PET diploma. In Switzerland, 59% of all diplomas awarded are in vocational education. VET/PET are attractive to students because they usually give them the status of apprenticeship, which comes with earnings and a true-work related experience.

Türkiye and the United Kingdom stand out because they are two highly centralised states:
Türkiye is a highly centralised state, with education policy under the authority of the Ministry of National Education (MoNE) (European Training Foundation, 2023). Türkiye offers intermediate and higher levels of vocational education. Continuing vocational education programmes are provided by the MoNE and the Ministry of Labour and Social Security, whereas higher vocational institutes operate autonomously while being nationally represented through the Council of Higher Education. Higher VET is offered in the form of an associate degree programme lasting 2 years and focused on rapid integration into the labour market. Vocational education and training have become a top priority for the Turkish government. The reform of its education system with the 'Education Vision 2023' policy notably aims to strengthen applied research activities in intermediate vocational education. MoNE set out various measures depending on the type of vocational-technical Anatolian high schools (VTAH): those facing academic difficulties need to be modernised and have access to training for teachers and additional courses regarding basic skills. Other VTAHs are performing greatly and have benefited from investment in R&D centres and laboratories working on intellectual property, registering patents, and developing brands and product designs. These high-performing VTAH, of which there are around 200, are in Organised Industrial Zones and are founded by companies "with the aim of training qualified graduates which will subsequently be able to enter the workforce" (European Training Foundation, 2023, p.31).

A case in point is Private Enka VTAH, one of the most prestigious VET schools in Türkiye, which was founded by the global engineering and construction firm Enka to promote high-quality EQF level 4 education. The school's curriculum and activities are independent of the company and are designed by the Turkish Ministry of National Education. Private Enka VTAH is thus considered to be a public school. However, the school's facilities and labs of the school have been funded by the Enka Foundation, as are the education costs of all students. The school is mostly funded by the Enka Foundation but also receives subsidies from the MoNE. Students of all grades are selected by teachers to carry out multidisciplinary or specialised research projects in chemistry, physics, or mechanical engineering.

VET applied research can be funded in several ways in Türkiye. Subsidies are granted by the agency of the Turkish government Scientific and Technological Research Institution of Türkiye, European programmes such as Erasmus+ and Horizon Europe, and the program about Centres of Vocational Excellence (CoVEs). The MoNE engaged in constructing at least one CoVE in each of the provinces of the country in a protocol signed with the Union of Chambers and Commodity Exchanges of Türkiye. Students are usually involved in applied research projects in Türkiye but voluntarily, as it is not part of their curriculum. Unlike in Canada, patents cannot be commercialised, as schools like private Enka VTAH are considered public schools.

Applied research in the **United Kingdom** is primarily focused on scholarship about teaching and learning. The aim is to establish a 'scholarship framework' through projects such as the Scholarship Project, which was funded by the government from 2015 to 2018 (Beddie & Simon, 2017b). The project aimed to improve the capabilities of teachers and enhance student learning in Further Education (FE) colleges that offer higher education.

Australia, Canada, and New Zealand are relevant examples in applied research by VET because they have advanced systems:
Australia has two research models with a strong end-user focus: rural research and development corporations and cooperative research centres (Beddie & Simon, 2017b). Rural research and development corporations are "a partnership between industry and government, funded through a co-investment model that involves levies on production and a matching government contribution." (Beddie & Simon, 2017b, p.30). These corporations conduct short-term studies to address today's issues and work on tomorrow's challenges through long-term activities. Cooperative research centres have been established in 1990 and focus on research applications and end-users, linking researchers with industry and government. They aim to "bridge the gap between discovery research and the requirements of industry for commercialisation-ready innovations." (Beddie & Simon, 2017b, p.32).

Australian public VET centres, known as technical and further education institutions (TAFE), established applied research centres to develop research and scholarly capability. (Victorian TAFE Association, 2018). Australian TAFEs are in 600 delivery points across central business districts, suburban, regional, rural, and remote locations (TAFE Directors Australia, 2020). The applied research centres within

TAFE are successful and have produced impressive results for institutes and their industry partners (Victorian TAFE Association, 2018). It has increased the interest of TAFE institutions in collaborating with industry in the field of applied research because it is "grounded in real industry contexts, problems and challenges" (Victorian TAFE Association, 2018, p.10). Following the creation of applied research centres, tools supporting AR&I were developed, such as the VET Applied Research developmental framework. This audit tool helps VET educators and other professionals assess their skills and capabilities in learning, communicating, and organising to determine if they are 'applied research literate' (Beddie & Simon, 2017b).

Canada has a largely decentralised governance structure in which provincial governments hold most policy responsibilities and are exclusively responsible for vocational education (European Training Foundation, 2023). Intermediate and higher levels of vocational education, as well as higher VET, are offered. Higher vocational education students represent one-third of all tertiary education students in the country. In Canada, applied research began modestly in the 1970s and has since expanded thanks to the creation of structures and funding systems (Méthot & al., 2022). The first *Centres collégiaux de transfert de technologie* (CCTT) were successfully created in Quebec in 1983.

The involvement of educational institutions in private-sector innovation has grown since the creation of Canadian college-affiliated Technology Access Centres (TACs) in 2012 based on Quebec's CCTT model. The TAC service model relies on applied research, technical services as well as training and knowledge mobilisation. TACs develop technologies that meet industry demands but do not claim intellectual property rights or an equity stake in these projects (Berthiaume & al., 2023). It enables small businesses to engage in research activities, giving them access to infrastructure, expertise, and government funding while limiting the risks involved (Méthot & al., 2022). It aims to complement the work of other innovation agents and avoid undue competition with private companies and unnecessary duplication. In seven years, the number of TACs has increased sixfold, reaching 60 in 2019 (Ganter de Otero, 2019). In 2022, the 60 TACs worked with almost 4200 businesses (Berthiaume & al., 2023). TACs are a great success thanks to several of their features. A TAC is agile, not time-constraint, and can adjust to changes in its internal and external environment to meet the needs of all stakeholders (Méthot & al., 2022). Students engaged in applied research projects benefit from accelerated practical experience to solve technical, scientific, and economic problems (TAFE Directors Australia, 2020). They also get connections to future employers and jobs, enhanced program curricula, and strong outcomes in experiential learning. Indeed, enhancing students' learning helps to build an innovative workforce. The over 2,000 specialised innovation experts of the TACs are in all Canadian provinces except Newfoundland and the Northwest Territories, so most of the Canadian population has access to them, with 95% living within 50 km of a college. The TACs are independent of each other and adapted to their local environment but form together the network Tech-Access Canada. This network enables TACs to share their knowledge and practices and provides access to the resources of every TAC across the country to any client, wherever in Canada (Berthiaume & al., 2023).

The federal government provides the largest source of funding for applied research projects, mainly through three funding organisations: the Natural Sciences and Engineering Research Council of Canada (NSERC), the Canadian Foundation for Innovation (CFI), and the Social Sciences and Humanities Research Council. In 2004, the NSERC launched the College and Community Innovation pilot program to promote applied college research. The program became permanent in 2008 and provides, since then, financial support to faculties through an annual fund of fifteen million Canadian dollars. Canadian colleges can benefit from the Technology Access Centre grant, a five-year, renewable, and stable funding, to carry out applied research activities in line with their regions' economic priorities. It represents $75 million, i.e. 2,4% of Canadian federal research funding for applied research (Victorian TAFE Association, 2018). In addition to this program, colleges, institutes, and affiliated research facilities have access to a CAD 10 million fund from the CFI (Méthot & al., 2022). Provinces also contribute financially; colleges located in Ontario, for example, have access to the Ontario Research Fund supported by the Ontario Ministry of Economic Development, Job Creation and Trade (European Training Foundation, 2023). The public investment in the R&D capacity of the Canadian college system was rewarded in 10 years (Beddie & Simon, 2017b).

The **New Zealand** system is quite particular. The Institute of Technology and Polytechnics are financed by public funds, just like in the other countries, but bound to undertake applied and technological research under the New Zealand Education Act 1989 (Victorian TAFE Association, 2018).

Overall challenges

The Australian example shows that VET centres' involvement in applied research depends on three key issues: the organisation's capability in terms of qualified human resources, its reputation, and its degree of autonomy to manage all aspects of the project (Packer, 2022). Most TVET centres lack the time, resources, or staff to engage in applied research activities (Ganter de Otero, 2019). The weakness of the centres in terms of applied research capacity and capability, with the absence of appropriate and corresponding support for teachers/academic staff are barriers driving the role of VET in the innovation system. The lack of time and money are the main constraints to doing research in the VET sector in Australia (Beddie & Simon, 2017b). Funding tends to move to universities, which attracts more and more students, to the detriment of VET centres. Over the last decade, spending on VET fell to 4% below 2005 levels, while higher education expenditure rose by 45% (Beddie & Simon, 2017a). Canadian TACs have similar problems and lack operating funds to grow

and be sustainable (Berthiaume & al., 2023). In Australia, teachers lack adequate resources to keep up with the latest technologies and innovations (Beddie & Simon, 2017a).

Even though research in VET has developed, it remains little recognised by the public, and little regarded as a professional practice (Victorian TAFE Association, 2019). VET is rarely considered as an applied research player in Australia, whether in the minds of policymakers or in the VET system itself (Beddie & Simon, 2017b). This lack of visibility makes the VET sector an underused resource in the innovation system, as in Australia (Beddie & Simon, 2017a). The trend is similar in the UK, where VET centres are not considered natural partners in innovation (Victorian TAFE Association, 2018).

VET applied research must be developed considering national economic needs to have a positive impact throughout the country. The new Canadian college-affiliated Technology Access Centres are not created in response to the national economic priorities for economic sectors or in response to emerging fields but to meet local priorities (Berthiaume & al., 2023). Yet, it is primordial that AR&I projects also address key Canadian government focus areas such as climate change, renewable energy, emergent technologies, access to health care, and reconciliation with First Nations communities. VET centres must be agile and adaptable to meet today's industry needs. Indeed, technical and vocational education (TVET) faces the transition to greener economies, the implementation of digital technologies in the world of work, and the emergence of new forms of entrepreneurship (Ganter de Otero, 2019). In Australia, changes to VET training packages require long timeframes, which is detrimental to the responsiveness of institutions towards the industry (Beddie & Simon, 2017a).

Recommendations and good practices

Although applied research projects differ from each other, they should all apply some good practices to be successful. The International mapping study on good practices of applied research in vocational education and training shows that ideally, the project lasts between 6 months and several years, involves students, and is co-funded by private companies (European Training Foundation, 2023).

Applied research is successful when:

- It is forward-thinking as part of the strategic direction of the organisation (Packer, 2022).
- It is based on existing strengths whether in terms of industry relations, technology, or unique facilitates (Packer, 2022).
- Research competencies are integrated throughout course levels (Packer, 2022).
- The partnerships are based on clear understanding and agreement upon goals, a focus on internal and external customers, commitment to excellence and to teamwork, decision-making based on measurement and data as well as to lifelong learning (Ganter de Otero, 2019).
- It follows the steps of planning, implementation, and sharing results (Victorian TAFE Association, 2019).
- A research problem and question is defined, the others' knowledge about the problem are studied, and an appropriate methodology is applied (Victorian TAFE Association, 2019).
- Data are collected, prepared, analysed, interpreted, and presented in quantitative or qualitative forms (Victorian TAFE Association, 2019).
- The results are disseminated to peers and the validity and reliability of findings are evaluated (Victorian TAFE Association, 2019).
- The priorities are identified, analysed, mapped, and established. It is important to engage external actors and stakeholders in the projects (Ganter de Otero, 2019).
- It includes a comprehensive human resource management approach (Ganter de Otero, 2019).

The UNESCO-UNEVOC trends mapping Innovation in TVET proposes general recommendations at the system, political, and institutional levels to improve innovation in TVET (Ganter de Otero, 2019):

1. **At the political level**
    - Implement policies to identify skills demands, establish Labour Market Information Systems, and develop up-to-date curricula and entrepreneurship in TVET (Ganter de Otero, 2019).
    - Develop an applied research skills framework to ensure professional standards (Beddie & Simon, 2017b).
    - Invest in staff to increase research capacity of the TVET centres (Beddie & Simon, 2017b).
    - Give VET centres time and resources (Ganter de Otero, 2019).
2. **At the system level**
    - Develop platforms, and support mechanisms to help TVET identify and connect with other local actors (Ganter de Otero, 2019).
    - Promote VET as an innovation partner to policymakers and practitioners (Edwards & Hazelkorn, 2019).
    - Develop a framework assessing VET teams' skills to find out if they are 'applied research literate' (Beddie & Simon, 2017b).
    - Support TVET centres in the identifying and accessing diverse sources of financing (Ganter de Otero, 2019).
3. **At the institutional level**
    - Adapt TVET school's management and governance systems to support the development and implementation of innovation (Ganter de Otero, 2019).

- Take into consideration motives and objectives as well as the leadership teams' capacity and motives (Ganter de Otero, 2019).
- Use indicators to identify and measure innovation (Ganter de Otero, 2019).
- Support staff members (Ganter de Otero, 2019).

3.2.2 Key findings from Orkestra's research project on TKgune

The survey conducted by the Vice-Ministry of Vocational Training and Orkestra-Basque Institute of Competitiveness provides information on the difficulties and needs of VET teachers from TKgune network to develop innovation projects:

1. **Teaching teams:**
   - VET centres of the TKgune network lack stable teaching teams in centres. This is due to staff turnover in the education system and the lack of teachers willing to develop innovative projects for companies.
   - Teachers lack training in detecting opportunities for innovation applied to companies.
2. **Economic resources:**
   - The respondents highlight the lack of economic resources to develop TKgune in the centres. VET centres need funds to pay teachers and have access to the latest technologies. For example, TKgune projects are invoiced, but not the time dedicated to the development of new knowledge of teachers.
3. **Framework and procedures**
   - There is a lack of available resources, i.e. machines and teaching staff know-how in VET centres. A catalogue of knowledge and resources applicable to TKgune, indicating available machine hours, and teacher hours should be defined.
   - There is a lack of procedures for transferring the knowledge gained to the students.
   - The respondents note the failure to design combined models of economic aid with the ecosystem (provincial councils, town councils, government, etc.).
   - Defining a programme that coordinates sectors such as education, industry, finance, is difficult.
   - The question of the responsibility for the products implemented in companies should be clarified.
   - For the respondents, TKgune should be considered a strategic project that aims to update teachers' knowledge in VET centres. It cannot be an unprocedural programme within the centre.

3.2.3 Key findings from the AIRinVET survey for VET

Profile of the VET centres surveyed

Participants' country and position within their VET institution

40 individuals involved in VET centres participated in the questionnaire. 20 countries are represented: Azerbaijan (1), Bosnia and Herzegovina (1), Estonia (2), Finland (1), Germany (2), Ireland (1), Latvia (1), Lithuania (3), Malta (1), Moldova (1), Netherlands (18), Norway (1), Peru (1), Poland (1), Portugal (1), Romania (1), Serbia (1), Slovenia (1), Spain (1).

The participants hold various positions within their VET institution, see figure 8:

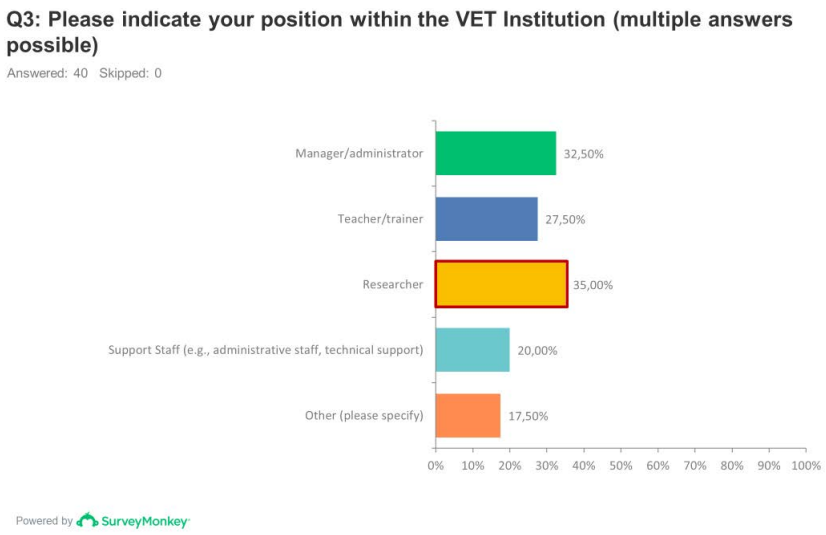

Figure 8. Position in VET institution

Six respondents work within Practorates, i.e. multi-disciplinary teacher teams who explore new professional practices through applied research in the Netherlands (European Training Foundation, 2023). One person who filled in the survey is quality assurance head.

Sectors and levels of VET centres[7]

The respondents were then asked about the sectors of activity of their VET centre. VET centres are mostly involved in education (47.50%), construction (42.50%), information and communication (42.50%) as well as manufacturing (42.50%). More than 30% focus on human health and social work activities (37.50%), accommodation and food service activities (35%), transportation and storage (32.50%), as well as electricity, gas, steam, and air conditioning supply (30%). They also work, to a lesser extent, in wholesale and retail trade (27.50%) financial and insurance activities (25%), professional, scientific, and technical activities (17.50%), water supply (17.50%), agriculture, forestry and fishing (12.50%), other service activities (10%), real estate activities (10%) and mining and quarrying (7.50%). Some participants mentioned other sectors, such as "tourism and hospitality" and "energy" for example.

The 8 levels defined in the European Qualification Framework (EQF) are offered within the VET centres surveyed. The most represented levels of education are EFQ 2, EQF 3 and EQF 4, see figure 9:

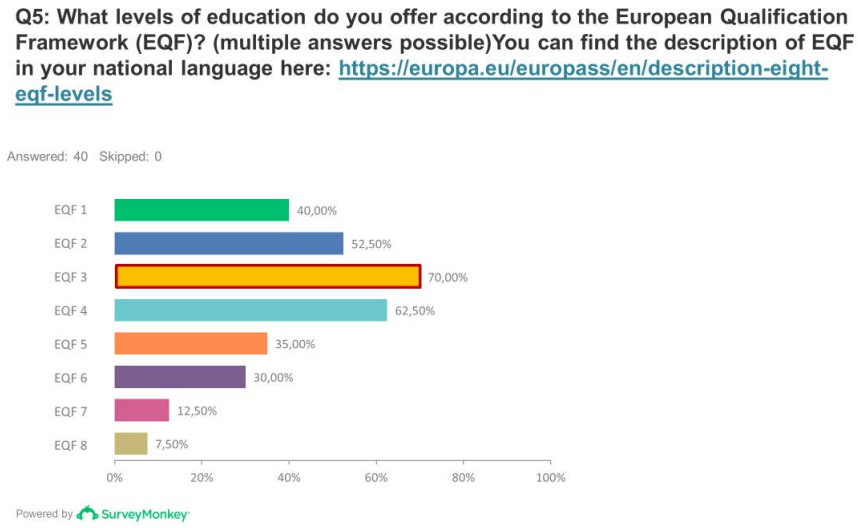

Figure 9. Levels of education offered in VET institutions

Size of VET centres

The courses offered by the VET centres surveyed are available for many students. Half of the VET centres surveyed have more than 2000 students, see figure 10:

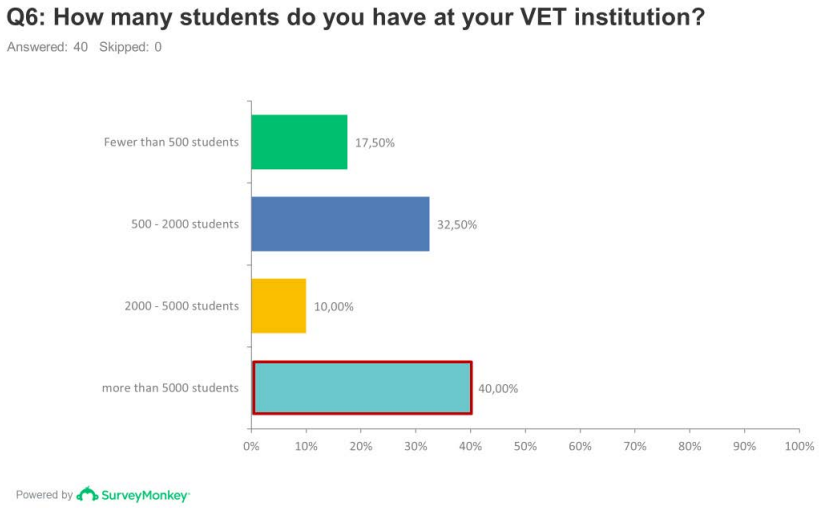

Figure 10. Number of students in VET institutions

7. The survey participants could give multiple answers.

These figures correspond to the number of staff employed in the VET institution, see figure 11:

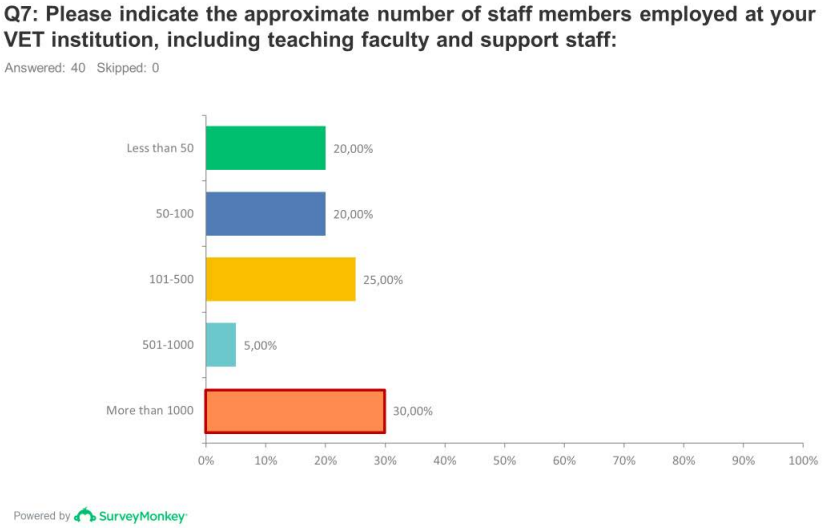

Figure 11. Number of staff employed in the VET institutions

The results show that the VET centres surveyed are either small or large. Few are medium-sized. They are well established; 95% of them have been operating for more than five years.

Type of training and services offered by VET

Various training and services are offered within the VET centres surveyed:

- 73.68% offer initial VET programs for individuals entering the workforce for the first time
- 71.05% offer continuing VET programs for individuals seeking to upgrade their skills or pursue career advancement
- 65.79% offer short-term professional development courses for upskilling or reskilling purposes
- 60.53% offer apprenticeship programs combine on-the-job training with classroom instruction
- 39.47% offer career guidance
- 36.84% train the trainers
- 31.58% offer higher VET programs providing specialised vocational training at a higher educational level

Lifelong Learning Programs, integration/language, switching pathway/remediation and organisation of exams/assessments are other types of training and services offered by three of the VET centres surveyed.

The questionnaire can be considered representative thanks to the diversity of responses from participants.

VET centres' involvement in applied research and innovation activities

Type of services provided by VET to companies

The next part of the questionnaire investigates the involvement of VET centres in applied research and innovation (AR&I) activities. The results show that applied research and innovative projects are not the main areas of cooperation between VET centres and SMEs but are handled by around one in two institutions, see figure 12:

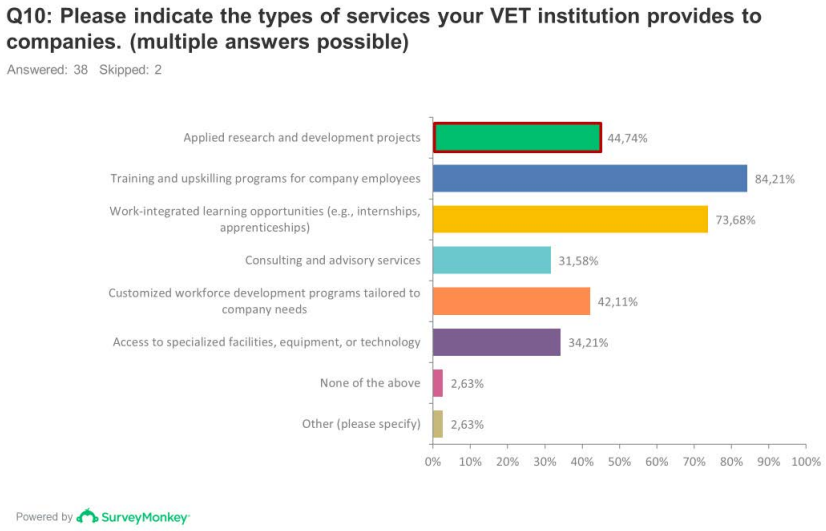

Figure 12. Type of services provided by VET institutions to companies

Average time spent on applied research activities per week

The participants spend on average 14 hours per week working on AR&I activities, which corresponds to around 35% of their working week for a 40-hour week.

Type of applied research and innovation activities undertaken by VET centres

13 VET centres described their involvement in various applied research and innovation activities. The most common AR&I activity undertaken by VET centres surveyed is the development of education materials, see figure 13:

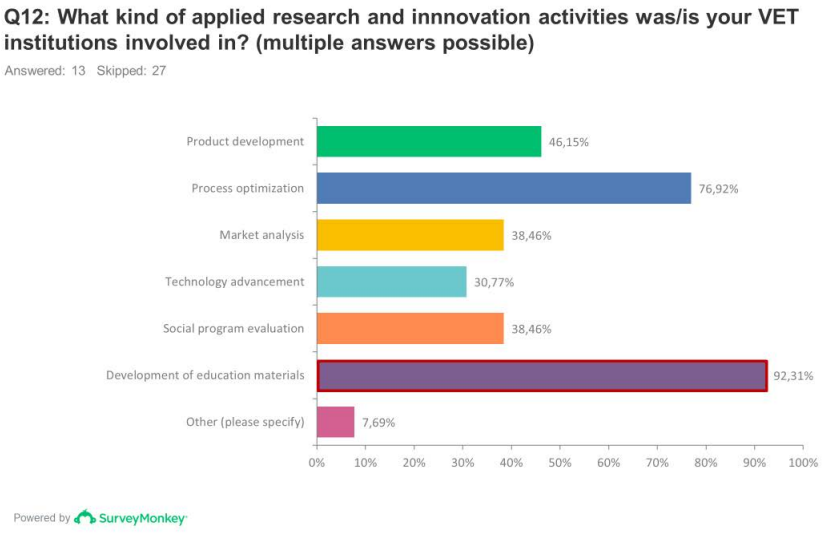

Figure 13. Type of applied research and innovation activities undertaken by VET institutions

VET centres also work on AR&I activities directly aimed at improving the competitiveness of SMEs such as process optimisation and product development. The results show that VET centres can offer a range of applied research and innovation services to SMEs.

Outputs and tangible solutions developed

VET centres were then asked about the outputs or tangible solutions that were developed with companies. Here too, the results are varied, and no clear trend is emerging:

- 46.15% have developed new product prototypes
- 46.15% have developed proof of concept
- 38.46% have developed market reports and insights
- 38.46% have developed programme impact assessments
- 23.08% have improved software algorithms
- 15.38% have developed streamlined production processes
- 7.69% have developed adapted educational programmes linked to the workplace (care and childcare)
- 7.69% have delivered skills analysis and curricula

Number of applied research case studies undertaken per year

According to the participants' responses, most VET centres undertake fewer than 10 applied research case studies[8] per year (fewer than 5 for 46.15% and between 5 and 10 for 23.08%). Among the 4 institutions left, 2 are involved in 11-50 case studies per year and 2 in more than 50.

Rating by VET centres of their experience in applied research activities

Respondents to the questionnaire are divided on their experience of engaging in applied research activities. 46.15% rate it positively, whereas 15.38% describe it as "challenging" or even "highly challenging" (7.69%). 30.77% do not know how to position themselves and responded "neutral".

VET centres' partners in applied research and innovation activities

VET centres work with many partners in applied research and innovation activities, see figure 14:

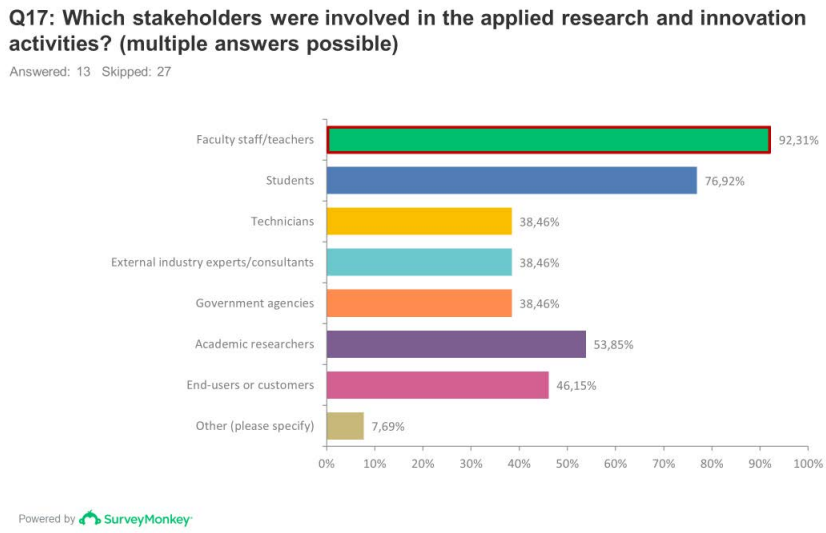

Figure 14. Stakeholders involved in applied research and innovation activities undertaken by VET institutions

VET centres surveyed mainly rely on in-house human resources (faculty staff/teachers, students, academic researchers) to develop AR&I activities. One participant commented that the partners change according to the project but that they always try to work in a trilateral manner with educational stakeholders, professionals, and researchers.

8. By case studies, we refer to projects.

Type of funding for applied research activities undertaken by VET centres

To finance their applied research and innovation activities, VET centres rely on grants or external funding, see figure 15:

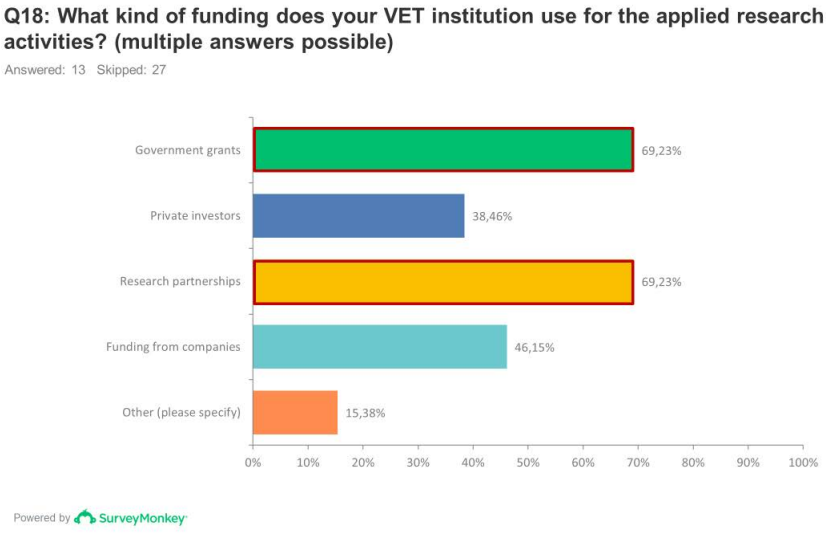

Figure 15. Type of funding used by VET institutions for their applied research and innovation activities

VET centres' collaboration with companies in applied research and innovation activities

Determining factors in the success of applied research activities

The success of a collaboration with companies on applied research and innovation projects depends on various elements. VET centres were asked to rate their importance on a scale of 1 to 5, with 5 being the highest. The weighted average shows how important the following factors are for VET centres:

1. Strong industry partnerships and collaborations, sufficient funding, and resources (4.42 out of 5)
2. Complementary expertise and resources (4.17 out of 5)
3. Strong commitment from both parties (4.15 out of 5)
4. Qualified staff with research expertise, proactive outreach, and promotion of collaboration opportunities to companies (4.08 out of 5)
5. Supportive institutional leadership, timely and reliable deliverables (4 out of 5)
6. Clear communication channels (3.92 out of 5)
7. Access to advanced technology or equipment, effective project management (3.83 out of 5)
8. Well-defined processes for project management and implementation (3.75 out of 5)

Most variables are rated more than 4 out of 5 by VET centres, which shows their importance in the conduct of successful collaborations with companies. All participants agree or strongly agree on the importance of having strong industry partnerships and collaborations, as well as complementary expertise and resources when working with companies. Half of the VET centres surveyed strongly agree on the importance of having sufficient funding and resources. Interestingly, one VET centre does not consider a strong commitment from both parties to be important for successful collaboration, unlike all other participants.

Barriers for VET centres to engage in applied research activities

The next question investigates why the VET centres surveyed have not collaborated with a company on applied research projects yet. Participants were asked to rate the 12 statements in terms of the barrier they represent ("none", "minor", "moderate", "significant", "major"). Responses varied, but all are considered obstacles. The lack of funding and resources, the lack of staff, as well as the time constraints and heavy workload are considered obstacles by all participants of the questionnaire. For 37.50%, time constraints and a heavy workload are major barriers, whereas the lack of funding and resources is mostly considered a significant barrier (53.33%). Cultural differences between education institutions and industry are perceived differently according to the VET centres. 18.75% do not see it as a barrier. Among the 81.25% left, 18.75% think it is a "minor barrier", 18.75% a "moderate barrier", 25% a "significant barrier" and 18.75% a "major barrier". The weighted average shows the most important obstacles according to VET centres on a scale of 1 to 5, with 5 being the highest:

1. Time constraints and heavy workload (3.88 out of 5)
2. Lack of funding and resources (3.60 out of 5)
3. Lack of staff (3.44 out of 5)
4. Insufficient faculty expertise in research and innovation (3.40 out of 5)

5. Unclear benefits or relevance (3.25 out of 5)
6. Lack of awareness among companies about collaboration opportunities (3.13 out of 5)
7. Administrative and contractual complexities, cultural differences between education institutions and industry, limited access to advanced technology or equipment (3.06 out of 5)
8. Limited industry partnerships (2.87 out of 5)
9. Regulatory or compliance issues (2.69 out of 5)

Despite the various barriers, VET centres wish to collaborate with companies on future applied research projects. 56.25% will "probably" consider it, whereas 43.75% responded "definitely".

Motivating factors for VET centres to engage in applied research activities

Different factors motivate them to collaborate with companies. Most VET centres are interested in the opportunities for knowledge exchange and networking (56.25% "agree", 43.75% "strongly agree"), and gaining access to specialised knowledge and expertise, as well as the access to funding or grants for collaborative projects (50% "agree", 37.50% "strongly agree"). VET centres tend to be less motivated by a potential enhancement of their reputation and visibility in the industry; 12.50% responded "neutral", 6.25% "strongly disagree" and 6.25% "disagree". The weighted average gives an overview of the greatest sources of motivation for companies:

1. Opportunities for knowledge exchange and networking (4.44 out of 5)
2. Access to specialised knowledge and expertise, access to funding or grants for collaborative projects (4.25 out of 5)
3. Access to equipment (4.06 out of 5)
4. Potential for innovative solutions to business challenges (3.94 out of 5)
5. Enhanced reputation and visibility in the industry (3.81 out of 5)

In the last question, the participants were asked about the key conditions that need to be met to undertake applied research projects with companies. Surprisingly, two variables were left out by the VET centres. No data is available on the importance of clear communication channels, effective project management and proactive outreach and promotion of collaboration opportunities to companies in the development of applied research projects. A strong commitment from both parties is considered "very important" by more than half of the participants (56.25%). Almost half of the VET centres surveyed (43.75%) do not know whether having well-defined processes for project management and implementation is an important condition to undertake applied research projects with companies. The weighted average shows how important the following variables are for VET centres:

1. Strong commitment from both parties (4.50 out of 5)
2. Supportive institutional leadership (4.31 out of 5)
3. Enhanced marketing and awareness efforts to promote collaboration opportunities (4.20 out of 5)
4. Increased funding and resources allocation, enhanced faculty training and expertise development in research and innovation (4.13 out of 5)
5. Strengthened industry partnerships and collaborations, streamlined processes, and reduced administrative burden (4.06 out of 5)
6. Improved access to advanced technology or equipment (4 out of 5)
7. Complementary expertise and resources (3.88 out of 5)
8. Well-defined processes for project management and implementation (3.75 out of 5)

Conclusion

The questionnaire results show that VET centres are interested in collaborating with companies on AR&I projects. They see it as an opportunity to exchange knowledge and networking, to have access to specialised knowledge and expertise as well as to funds. However, they face various obstacles, and their engagement is limited for reasons of time, personnel, and financial resources. Overall, the experiences of the VET centres surveyed have been rather good so far, but looking at the figures, more than half of the questionnaire participants do not provide AR&I services to companies.

3.2.4 Key findings from the interviews

The interviewees highlighted the benefits of collaboration between SMEs and VET centres on applied research and innovation activities, which are valuable for everybody. However six major obstacles to the involvement of VET centres in AR&I projects with companies were identified.

Lack of visibility and recognition

According to many interviewees, VET centres lack recognition and are rarely seen as research partners by other stakeholders. Interviewees from Australia, Estonia, Latvia, and Malta explain that VET is generally considered to be at a lower level than higher education institutions. VET is seen by society as "a second-chance education system" according to a Maltese interviewee and is less attractive for students.

Portugal is a case in point; around 60% choose a traditional path for their secondary studies. VET centres are overshadowed by higher education institutions, that are considered the main research partners. The value of AR&I by VET also tends to be underestimated by SMEs, as in the Netherlands.

Lack of funding

The lack of recognition leads to difficulties in funding AR&I activities by VET centres. VET centres compete with higher education institutions, that have a better reputation and benefit from more funding schemes. These financing difficulties are emphasised by interviewees from Australia, Belgium, Canada, Croatia, Estonia, Finland, Hong Kong, Latvia, Malta, and the Netherlands. Canada is a good example; according to one interviewee, 97% of federal research funding and around 94-96% of grants from funding agencies go to universities. Interviewees from Canada, Finland, Portugal, and Spain deplore the lack of funding for VET centres. Engaging in AR&I activities costs a lot of money, and not all occurred costs are eligible or can be covered by grants, as in Canada. Interviewees from Canada and Spain underlined that the lack of funding leads to a lack of personnel. In Canada, some vacant positions have not been filled for several years now. The question of the sustainability of financing also plays an important role in VET engagement in AR&I activities. Interviewees from Croatia, Finland, and the USA consider securing research funding a significant challenge. Another issue is pointed out by a Latvian interviewee; VET centres are not always aware of their funding options.

Lack of time

Besides funding, AR&I activities require time from VET teachers and managers. In several countries, such as Belgium, Canada, Latvia, Portugal and Spain, VET teachers lack time to engage in AR&I activities. Research should be fully integrated into VET teachers' curriculum so that they can balance between teaching and research. However, this would require the teaching hours to be replaced and therefore more money, as underlined by a Canadian interviewee. The heavy administrative burden can also be an obstacle to VET engagement in AR&I activities, as explained by interviewees from Australia, Canada, and Spain.

Lack of capacity

All the challenges presented above make it difficult to attract qualified personnel, as shared by a Canadian interviewee. This is especially challenging for specific areas such as cyber security research. VET centres need to be well equipped, whether in terms of resources or personnel and to meet the needs of SMEs. According to an interviewee, demand from companies exceeds the capacity of colleges in Canada.

Democratise AR&I in SMEs and VET centres

SMEs and VET centres have different cultures, which can make their collaboration challenging. According to a Latvian interviewee, SMEs' main objective is to be competitive. Therefore, they tend to place more importance on the financial side than on the fundamental value of projects. Interviewees from Latvia and Spain also underline the difficulties in attracting companies to collaborate with VET centres. One reason why SMEs can be reluctant to engage in AR&I projects with VET centres is the lack of control regarding information security. An interviewee from Latvia explains that students involved in AR&I projects with one SME may then work at a competitor's company. VET centres must therefore have something interesting to offer to the company to get it on board, as said by a Spanish interviewee. Carrying out AR&I does not only require flexibility on the part of SMEs; VET teachers also need to have an open attitude and a certain mindset to engage in such projects, as one Dutch interviewee recalls.

Lack of framework

Applied research by VET needs to be framed at various levels to reduce the barriers of VET centres to engage in such activities. The case of the Andalusian region in Spain shows that beyond the definition of general objectives, it is essential to establish connections between the stakeholders in a framework way. An interviewee from this region shared the difficulty of large communities such as Andalusia, Catalonia, Madrid, and Valencia to coordinate and the lack of connections between the different regions. Interviewees highlighted the need to establish a framework to respond to the lack of recognition, funding, time, and capacity of VET centres. In Australia, there is no set time for VET teachers to carry out research within their institutions. The situation is similar in Latvia, where applied research is optional for VET teachers. Interviewees from both countries explained that VET teachers' approach would be different if AR&I activities were completely integrated into curriculum modules and given a specific time. AR&I activities by VET also need to be better framed financially in some countries. A Dutch interviewee underlined that VET centres for EQF3 and 4 are not considered knowledge institutes in the Netherlands and are therefore excluded from some grant schemes dedicated to innovation. The lack of a framework for financial support for AR&I activities was also stressed out by an Australian interviewee.

3.3 Training for VET teachers

From 23rd to the 25th of January, 2024, a training for VET teachers took place in Hamburg. The primary focus of this training was to equip educators with strategies for engaging SMEs in applied research and innovation (AR&I) in VET. The overarching goal was to empower teachers and managers with the necessary tools to enhance SMEs' awareness of the opportunities of AR&I in VET.

A cohort of 12 participants, predominantly comprising VET teachers, converged for this experience, coming primarily from Basque Country and Germany. The training consisted out of 2 days with site visits and presentations, followed by a day of lectures and workshops. For a more in-depth insight into the training content, a detailed description (adhering to the AIRinVET curriculum template), is available in Appendix 5.

Site visits

The first day, the participants visited the Berufliche Schule für Stahl- & Maschinenbau BS04, a VET school for industrial mechatronics and metal technology. Participants attended classes of the dual apprenticeship programming robots and working with their online learn management system. Two students of higher education showed their final exam project with great best practices of applying research in VET. Participants were shown how Bachelor professionals had worked with assessment of 3D printing results and metal construction for agriculture machinery. Both projects were thrilling due to their capacity to apply innovation research methods and designs. The students have shown their professional way how they managed their project and how the teacher were supporting them.
After lunch, the participants had a presentation and discussion while introducing the German apprenticeship dual system. It was a great experience for all participants to see how the VET systems differ and how applied research can be integrated to VET.
After a long day of intensive training, everyone had a nice dinner down at the Hamburg Harbor.

The start of the second day began with a small recap of the day before and the discussion went into depth while introducing the Basque system of VET research. There, research is mainly conducted by the teachers and trainers of the schools and funded by the government. After finding new solutions, they are transferred to students and learners.
In the afternoon, the participants visited the center of applied aviation research (Zentrum für angewandte Luftfahrtforschung), where they were shown a lot of new prototypes drones and hydrogen approaches. Although it was engineering and academic applied research, you could estimate how those kinds of approaches are also possible to transfer to the VET system. After the round trip through the laboratories, the participants attended an introduction to the study integrated apprenticeship model of the Berufliche Hochschule Hamburg (BHH). They discussed how to integrate research and learning, see figure 16:

Figure 16. Picture of the visit to the Center of applied aviation research – ZAL in Hamburg, January 24, 2024

Training day

On the last day, the participants engaged in a comprehensive training program comprising five distinct blocks, each facilitated by various partners affiliated with the AIRinVET project. The first block of the training introduced participants to a valuable tool for stakeholder mapping within their innovation systems. During this session, participants actively utilised the tool, gaining insights into their current partners, those they aim to actively engage, and those they intend to keep informed. This exercise not only provided a visual representation of existing collaborations, but also highlighted potential gaps in the network, indicating which types of partners might be underrepresented, see figure 17:

Figure 17. Stakeholder mapping tool used by participants from different organisations and regions
From left to right: France and Ukraine, Tartanga, Basque Country (2x), Germany and Techniek Nederland.

In the second block of the training, the participants delved into an analysis of the current status of applied research within their VET centre. Employing the dimensions established by the AIRinVET project in WP2, participants were guided through an explanation of these key dimensions. Subsequently, each participant gauged their institution's self-capacity in applied research through a brief questionnaire and plenary discussion. This interactive session facilitated a collective understanding of the diverse dimensions of applied research in VET, as well as provided individual participants with valuable insights into the current state of applied research within their own VET centres.

The third block consisted out of an interactive lecture on applied research and innovation in VET in Germany. Impressions of the last days were summarised, followed by a showcase on how research is combined with learning in VET at the BHH. Case studies were shown, and the activities of the last days were discussed.

In the fourth block, several additional recommendations and tools were presented to the participants. The session started with a concise overview of the landscape of AR&I in the Basque Country, setting the stage for a lecture on diverse strategies to cultivate an applied research mindset. A decision tree was unveiled to further equip participants with practical insights on how to engage SMEs in AR&I projects. Subsequently, participants were introduced to a different decision tree tailored for VET centres, illustrating how they could effectively collaborate with SMEs. This segment allowed participants to actively engage with the decision tree on paper, responding to the questions from the perspective of an SME. Notably, participants recognised the decision tree as a valuable conversation starter in the collaborative process. For an in-depth exploration of the decision tree, please refer to Chapter 2.3.

In the last block, participants gained practical insights and skills for fostering successful collaborations between VET centres and SMEs. Strategies for building and maintaining meaningful partnerships, effective communication, conflict resolution and assessing SME readiness were discussed in an interactive lecture. Lastly, the training participants familiarised with the concept of the elevator pitch. They all got to practice their own elevator pitch in which they presented project ideas to potential SME partners, see figure 18.

Figure 18. Pictures of the AIRinVET training in Hamburg, January 23-25, 2024

Training evaluation

As the last training day concluded, participants provided feedback through an evaluation survey, reflecting their overall experience of the training. Encouragingly, the responses were very positive. All participants unanimously agreed that the overall organisation of the training was good, and that the duration and schedule of the training were appropriate. Furthermore, the consensus among the participants was that the atmosphere throughout the training was encouraging. Additionally, most participants found the group size to be appropriate.

The positivity extended to the training content and methods, with participants expressing a unanimous satisfaction. All attendees agreed that the training content met their expectations, and that the topics and addressed issues were relevant to them. They found that the content was well organised and easy to follow, and most participants gained valuable knowledge from lessons and examples presented during the training. All participants considered the site visits as well as the training day as useful and informative.

When participants were asked about the tools and tips they found most valuable to take home, the decision tree emerged as the standout. Additionally, the dimension tool, the elevator pitch and management in the dual system were cited by participants as something to take home.

The participants found great value in observing how applied research is conducted in VET across different countries. They appreciated the opportunity to exchange diverse opinions and explore various models of the framework within the European context. The training provided them with profound insights into the intricacies of the AIRinVET system, offering a comprehensive understanding of best practices and alternative methodologies. Additionally, some participants mentioned that the training enhanced their understanding of the collaborative dynamics between VET centres and SMEs.

Altogether, the participants have been very positive on the training. The average grade the participants gave the training was an 8,8 out of 10. While the feedback was predominantly favourable, there were diverse suggestions of improvement from the participants. These included recommendations such as recruiting more individuals from different countries to enhance the diversity of perspectives, incorporating more interactive elements, providing additional examples of innovation projects in SMEs, increasing the number of site visits, enhancing management practices, focusing on professional offers, and establishing a structured framework for applied research. This feedback underscores the participants' engagement with the training, offering valuable insights for refining and optimisation of future trainings.

To access the evaluation form the participants filled out, please refer to Appendix 6.

4. MINDSETS FOR APPLIED RESEARCH AND INNOVATION

The mindsets of VET centres for AR&I are influenced by regional contexts, differences in systems, regional and national policies, and cultural backgrounds. While taking these factors into account, we will identify the main barriers to establish AR&I systems in VET centres at different levels (political, SME, and VET institution levels) in this section. The task will be carried out based on personal interviews, complex surveys, and findings of WP2 dedicated to the mapping and contextualisation of applied research in VET. Results of T3.2 and T3.3 of this WP3 will also be used to feed the study. The identified barriers will be clustered and processed to learn their causes and to determine the measures that should be adopted to overcome them. Three different approaches will be proposed to develop an AR&I culture within the management teams at VET centres, within the teachers and staff, and the companies.

A series of recommendation, coaching actions and suitable activities will be elaborated to support VET centres in their intention to improve mindset changes.

4.1 SME and VET centre approaches to AR&I activities

The surveys enable to compare the AR&I needs and expectations of SMEs and VET centres. The results show that carrying out applied research activities is not a priority for SMEs. Among the SMEs surveyed, 53.33% do not carry out AR&I projects. Collaboration between VET centres and SMEs on AR&I activities remains modest. Only 44.74% of VET centres work on AR&I activities with SMEs, whereas none of the SMEs surveyed collaborate with VET centres. It is interesting to compare the responses of SMEs and VET centres surveyed to see whether their approaches to applied research correspond. This will give us information on the potential of collaboration between SMEs and VET centres and help us design the strategy to adopt to instil an AR&I culture based on public-private partnerships.

Type of applied research and innovation activities undertaken by SMEs and VET centres
AR&I activities undertaken by SMEs and VET centres are quite similar, see figure 19:

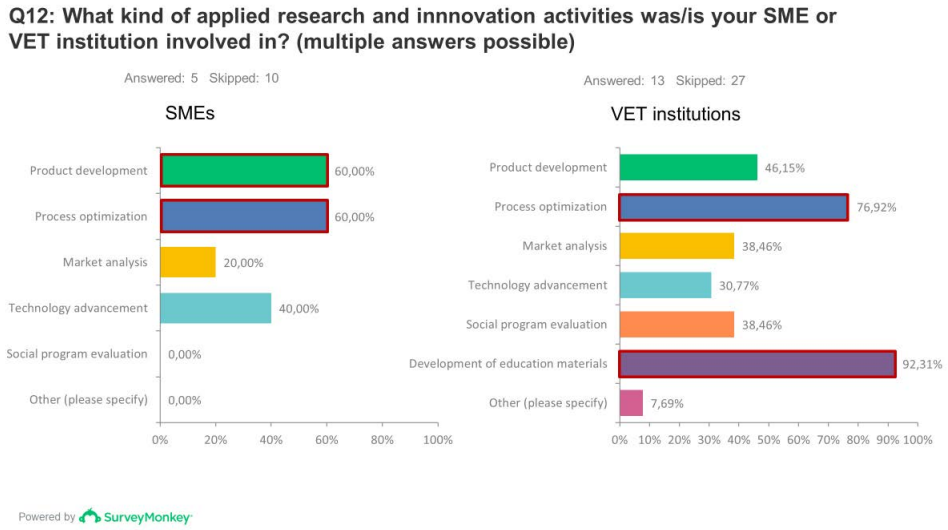

Figure 19. Type of applied research and innovation activities undertaken by SMEs and VET institutions

It is interesting to note that almost all VET centres surveyed are involved in the development of teaching materials (92.31%), demonstrating the value and importance of this activity. However, the development of teaching materials does not directly meet the needs of SMEs and is thus not a type of AR&I activity they address. The results show the wide range of AR&I activities that VET centres can bring to SMEs: research, analysis and data collection or proof of concept, prototyping, testing, simulations, feasibility studies and sampling.

VET and SMEs' partners in applied research and innovation activities

VET centres and SMEs surveyed work mainly with their in-house human resources, see figure 20:

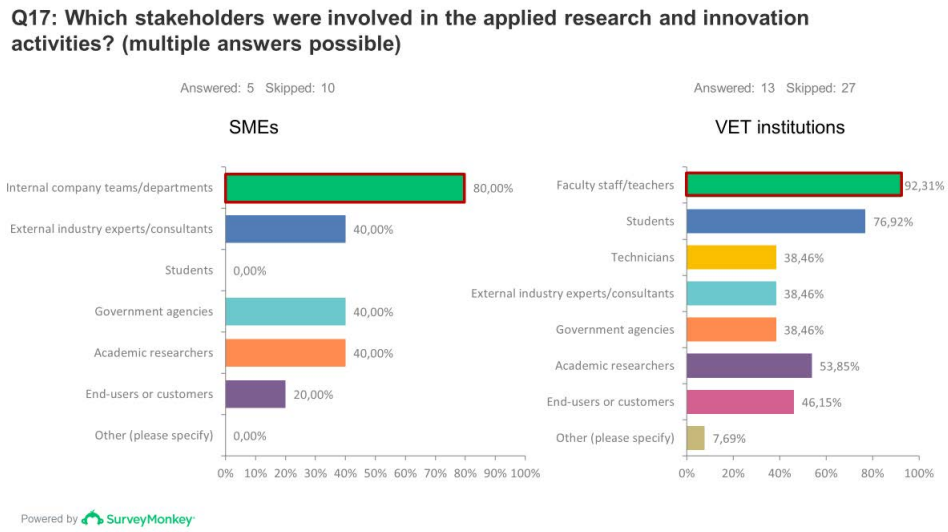

Figure 20. Stakeholders involved in applied research and innovation activities undertaken by SMEs and VET institutions

Most VET centres involve their faculty staff/teachers (92.31%), students (76.42%) or academic researchers (53.85%). Among the SMEs surveyed, 80% use their internal team/department. Both SMEs and VET centres also collaborate with government agencies, external industry experts/consultants and end-users/customers. If they collaborate with the same external partners, SMEs and VET centres work little together on AR&I activities. 60% of the SMEs surveyed do not work with educational institutions and none of them work with VET centres.

Type of funding for applied research activities undertaken by SMEs and VET centres

SMEs and VET centres use the same funding for their AR&I activities, see figure 21:

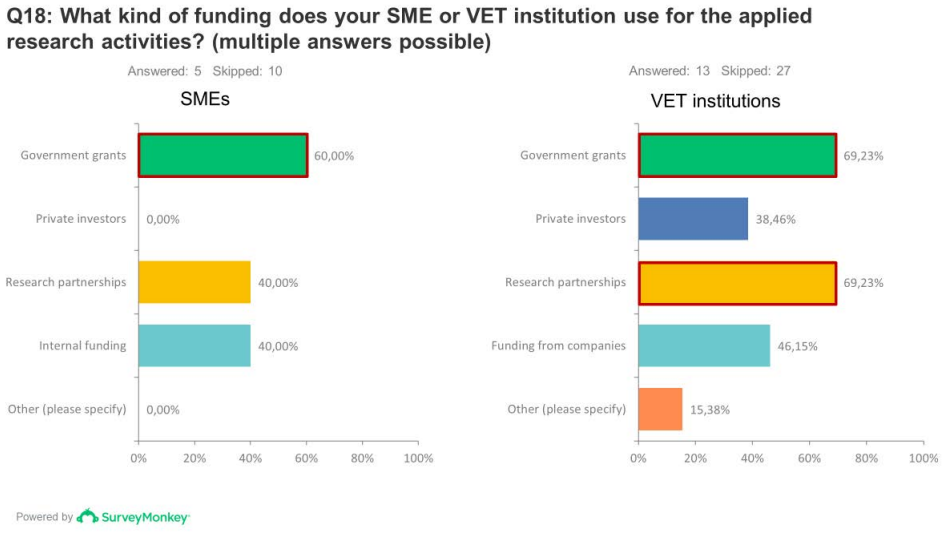

Figure 21. Type of funding used by SMEs and VET institutions for their applied research and innovation activities

Governmental grants are the type of funding most used by the VET centres and SMEs surveyed. They also rely on research partnerships. SMEs also count on their internal resources to engage in AR&I activities, so do VET centres; 46.15% use funding from companies. The results show that VET funding sources are much more diverse than those of SMEs. Indeed, VET centres also use, to a lesser extent, private investments (38.46%), European grants (7.69%) and subsidies through grant providers (7.69%). This can be explained by the difference in terms of internal resources; VET centres are not intended to be profit-making and have modest means at their disposal so their engagement in AR&I activities depends heavily on external sources of funding.

Determining factors in the success of applied research activities between SMEs and VET centres

SMEs and VET centres consider clear communication channels, complementary expertise and resources, effective project management, timely and reliable deliverables and strong commitment from both parties to be important factors in the success of applied research activities. However, the de degree of importance of these factors is not the same for SMEs and VET centres. Effective project management, timely and reliable deliverables, as well as strong commitment from both parties are the most important factors for SMEs (rated 4.50 out of 5). If VET centres also consider strong commitment from both parties very important (4.15 out of 5), they place greater emphasis on complementarity expertise and resources (4.17 out of 5) when carrying out AR&I projects with SMEs. As with their type of funding, this can be explained by the fact that VET centres generally have modest resources. It is interesting to note that effective project management (3.83 out of 5) and clear communication channels (3.92 out of 5) are of rather average importance for VET centres.

Motivating factors for SMEs and VET centres to collaborate on applied research activities

SMEs and VET centres main motivations to collaborate on applied research activities are the same. Opportunities for knowledge exchange and networking (rated 4.38 out of 5 by SMEs; 4.44 out of 5 by VETs) and access to specialised knowledge and expertise (4.13 out of 5 for SMEs; 4.25 out of 5 for VETs) are the main sources of motivation for SMEs and VET centres. However, SMEs and VET centres disagree on the degree of importance of the other factors in their decision to engage in AR&I activities. VET centres surveyed are also motivated by access to funding or grants for collaborative projects (rated 4.25 out of 5) and access to equipment (4.06 out of 5), whereas these two factors are not important to SMEs (respectively rated 2.88 and 2.75 out of 5). SMEs' motivation to collaborate with VET centres on AR&I activities is based on potential for innovative solutions to business challenges (rated 4 out of 5) and enhanced reputation and visibility in the industry (3.75 out of 5). Conversely, these are the two factors that least motivate VET centres to work with SMEs (respectively 3.94 out of 5 and 3.81 out of 5).

4.2 Barriers to establish AR&I mindset

The findings from desk research, Orkestra's research project on TKgune, the survey, and the interviews provide an overall understanding of the obstacles faced by VET centres when engaging in AR&I activities. Comparing the results in section 3.2 allows us to classify them by importance and to identify the recommendations to be followed by the different stakeholders.

1. **Lack of financial resources**
   Desk research, as well as all people surveyed or interviewed underline the importance that funding plays in VET engagement in AR&I activities. VET centres surveyed consider sufficient funding, and resources the most important factor to carry out a successful AR&I project with SMEs (rated 4.42 out of 5). However, our investigation points out the lack of financial resources at VET centres and shows it has a direct impact on their engagement in AR&I activities. 53.33% of the VET centres surveyed rate the lack of funding and resources a significant barrier. Respondents from the TKgune network explain they lack financial resources to develop AR&I in their VET centres. The situation in Australia is similar, as emphasised by F.M. Beddie and L. Simon in their 2017 study on *VET Applied Research: Driving VET's Role in the Innovation System*. A reason why VET centres lack funding for AR&I activities is the competition with higher education institutions. According to the interviewees, higher education institutions have a better reputation than VET centres and thus benefit from more funding schemes. This observation is shared by F.M. Beddie and L. Simon in their 2017 study, who explain that funding tends to move to universities to the detriment of VET centres. The interviewees point out that engaging in AR&I activities costs a lot of money for VET centres and that financing must be sustainable. The survey clearly shows that increasing funding and resources allocation would democratise applied research and innovation within VET centres; the importance of this factor is rated 4.13 out of 5 by VET centres surveyed.

2. **Lack of qualified human resources**
   The importance to have qualified human resources is highlighted in desk research. T. Packer describes it as a decisive factor in VET engagement in AR&I activities in his 2022 report on *applied Research as a teaching and learning strategy in vocational education and training*. Having a qualified staff with research expertise is also rated important (4.08 out of 5) in the success of an AR&I project by VET centres surveyed. The interviews and Orkestra's research project on TKgune show that it is difficult for VET centres to attract qualified personnel and that they lack stable teaching teams. This is due to staff turnover in the education system and the lack of teachers willing to develop innovative projects for companies. VET centres from the TKgune network explain that teachers lack training in detecting opportunities for AR&I with companies. The survey shows that enhancing faculty training and expertise development in research and innovation is a key condition (rated 4.13 out of 5) for developing an AR&I mindset within VET centres.

3. **Lack of equipment**
   Having access to advanced technology or equipment is considered an important factor in the success of AR&I projects by VET centres surveyed. Yet our investigation shows that VET centres lack equipment, as emphasised by TKgune network. According

to the 2017 report by F.M. Beddie and L. Simon on *Developing VET applied research: steps towards enhancing VET's role in the innovation system*, beyond having access to equipment, VET teachers need to keep up with the latest technologies and innovations. VET teachers lack adequate resources regarding this, as the example of Australia shows.

4. **Lack of time**
   Another major obstacle to AR&I by VET that comes out of our investigation is the lack of time. The 2017 report by F.M. Beddie and L. Simon on *VET Applied Research: Driving VET's Role in the Innovation System*, the survey for VET centres and the interviews underline that time constraints and heavy workload are a source of discouragement for VET centres wishing to engage in AR&I projects. VET teachers lack time to carry out research alongside their teaching activities. VET centres surveyed and the interviewees also stress out the heavy administrative burden associated with AR&I projects.

5. **Lack of recognition**
   VET centres are perceived differently from higher education institutions, as the funding gap between their AR&I activities presented above illustrates. The interviewees explain that universities are very much involved in AR&I projects, whereas VET centres are rarely seen as research partner. This is notably the case in Australia (Beddie & Simon, 2017b) and in the UK (Victorian TAFE Association, 2018).

6. **Lack of framework**
   Applied research and innovations activities are differently framed depending on the region or the country. However, our investigation enables to identify key points where a framework is needed. According to the interviewees, this framework should respond to the lack of recognition, funding, time, and capacity of VET centres. TKgune network, for example, mentions the lack of procedures for transferring the knowledge gained. Coordination between the stakeholders is essential in the success of AR&I projects between VET centres and SMEs, which have different structures and aims. This is particularly important for large communities, as explained by one interviewee from Andalusia. One example is the lack of combined economic support models with the ecosystem mentioned by the VET centres in the TKgune network. Nevertheless, while being framed, VET centres need to remain agile and easily adaptable to meet today's industry needs (Berthiaume & al., 2023).

7. **Difficulties to engage SMEs**
   Another obstacle to VET engagement in AR&I activities is the difficulties in attracting companies. This is partly due to the lack of visibility of VET centres as potential research partners. 75% of the SMEs surveyed lack awareness about potential cooperation and 62.50% of them have difficulties finding suitable educational institutions. The survey and the interviews show that the cultural differences between education institutions and industry are also perceived as a barrier to their cooperation, whether by VET centres or SMEs (87.50% think so). A Latvian interviewee explains that SMEs place more importance on the financial side than on the fundamental value of projects because their main objective is to be competitive. The survey shows that most SMEs (75%) find the benefits or relevance to company goals unclear.

4.3 Recommendations & good practice

To foster an applied research mindset in VET centres and SMEs, a series of recommendations, coaching actions, and suitable activities for each group should be followed. These recommendations are intended for all stakeholders involved in AR&I projects, i.e. the governments, umbrella organisations, VET centres and SMEs. Overall, it is essential to have a clear communication strategy to disseminate information about the importance of applied research and its benefits throughout the VET centres or SMEs. VET centres and SMEs' approach needs to be regularly reviewed and updated to ensure that it remains relevant and effective in fostering an applied research mindset within the organisation.

Target Group A: Management Teams at VET Centres

1. **Workshops and Training Sessions:**
   - Organise workshops and training sessions specifically designed for management teams. These sessions should focus on the importance of applied research, its benefits, and how it can drive innovation and growth in vocational education.
2. **Case Studies:**
   - Share case studies of successful VET centres or SMEs that have embraced applied research to achieve tangible outcomes. Highlight the impact on their programs, students, and competitiveness.
3. **Demand identification**
   - Help management teams identify current companies' needs and anticipate the future demand for skills.

4. **Strategic Planning:**
    - Help management teams develop a strategic plan that incorporates applied research as a core component. Ensure that research objectives align with the centre's overall mission and goals.
5. **Resource identification**
    - Help management teams identify and assess the available resources. Leverage its existing strengths to develop a mindset within the VET centre. This includes industry relationships, technology, facilities, human resources, or any unique feature of the VET centre.
    - Promote its strengths to potential partners. Invite them to come to the VET centres and show them around.
6. **Resource Allocation:**
    - Assist in identifying and allocating resources, both financial and human, for research initiatives. This may involve securing funding, grants, or partnerships with industry players.
7. **Mentorship and Networking:**
    - Connect management teams with mentors who have experience in fostering applied research mindsets. Encourage participation in relevant networks and associations.
8. **Measurement and Evaluation:**
    - Establish key performance indicators (KPIs) to assess the impact of applied research initiatives. Regularly evaluate progress and make adjustments as needed.
9. **Dissemination of the AR&I activities:**
    - Disseminate internally and externally the methodology and the results of the AR&I activities carried out by the VET centres. This is essential to foster an AR&I mindset within the VET centres and show the benefits of engaging in such projects.
10. **International exchanges**
    - Develop exchanges with experienced international partners in AR&I. Share good practice and results of the projects.

Target Group B: Teachers and Staff of VET Centres

1. **Human resources management**
    - Adopt a human resources management approach that supports VET teachers and staff engaged in AR&I projects.
2. **Time**
    - Integrate research in teachers' curricula. Give them specific time dedicated to research and help teachers organise their time between teaching and research.
3. **Professional Development:**
    - Offer professional development opportunities to teachers and staff, including workshops, webinars, and courses on research methodologies and project management.
4. **Collaborative Projects:**
    - Encourage collaboration between teachers, staff, and students on applied research projects. Create a culture of teamwork and knowledge sharing.
5. **Research Grants:**
    - Provide information on research grants and funding opportunities that teachers and staff can apply for. Assist in the application process.
6. **Research Communities:**
    - Establish research communities or interest groups within the VET centre. These forums can facilitate discussions, idea sharing, and peer support.
7. **Recognition and Incentives:**
    - Recognise and reward teachers and staff who actively engage in applied research. Consider incentives such as awards, promotions, or additional resources for their projects.
8. **Continuous Learning:**
    - Promote a culture of continuous learning by encouraging teachers and staff to attend conferences, publish their research findings, and stay updated on industry trends.
9. **Feedback Mechanisms:**
    - Create feedback mechanisms where teachers and staff can provide input on the research culture and suggest improvements.
10. **Knowledge transfer**
    - Help teachers transfer the knowledge gained throughout the projects with its network and particularly with the students.
11. **Student Involvement:**
    - Involve students in research projects to not only enhance their learning but also to instill a research-oriented mindset from an early stage.

Target Group C: SMEs management and staff

Tools and Resources:

1. **Applied Research Workshops:** Develop workshops or webinars that introduce SMEs to the concept of applied research, its benefits, and how collaboration with VET providers can be mutually advantageous.
2. **Research Grants Database:** Classify available research grants and funding opportunities in a database, making it easier for SMEs to find and apply for financial support and share the existing of these information with the SMEs. .
3. **Mentorship Program:** Establish a mentorship program where experienced professionals from VET centres guide SMEs through the research process.
4. **Online Knowledge Hub:** Build an online platform or knowledge hub where SMEs can access research guides, case studies, and best practices in applied research.
5. **Networking Events:** Organise networking events that bring together SMEs, VET providers, and researchers to facilitate collaboration and knowledge sharing.

Recommendations:

1. **Identify Common Goals:** Encourage SMEs and VET providers to identify shared goals and areas where applied research can benefit both parties.
2. **Build Trust:** Emphasise the importance of trust and strong relationships in collaborative research efforts. Open communication and a transparent approach are essential.
3. **Tailored Solutions:** Suggest that SMEs tailor their research projects to address specific challenges or opportunities within their own company, industry, or market.
4. **Diverse Teams:** Advocate for the formation of diverse research teams that include SME representatives, VET students, and faculty members.
5. **Long-Term Perspective:** Promote the idea that applied research is an investment with long-term benefits rather than a short-term endeavour.

Coaching Actions:

1. **Needs Assessment:** Conduct a needs assessment to understand the specific research needs and capabilities of each SME.
2. **Project Planning:** Assist SMEs in developing detailed project plans, including research objectives, timelines, and resource allocation.
3. **Research Methodology Training:** Provide training in research methodologies, data collection, and analysis techniques.
4. **Grant Proposal Support:** Help SMEs prepare strong grant proposals, including budgeting and project justification.
5. **Project Management:** Offer guidance on project management, ensuring that research projects stay on track and within scope.

Suitable Activities:

1. **Collaborative Projects**: Encourage SMEs and VET providers to initiate joint research projects, addressing real-world problems faced by the SMEs.
2. **Internship Programs:** Establish internship programs where VET students work within SMEs on research initiatives, gaining practical experience.
3. **Knowledge Exchange Seminars:** Host seminars where SMEs and VET providers can share their research findings and insights with a broader audience.
4. **Showcase Events:** Organise events or exhibitions where SMEs can showcase their innovative research outcomes to potential clients, investors, or partners.
5. **Feedback Loops:** Implement feedback mechanisms to continuously assess the effectiveness of applied research projects and make improvements.
6. **Celebrating Success:** Recognise and celebrate the achievements of SMEs in applied research through awards or public acknowledgments.
7. **Continuous Learning:** Encourage SMEs to continue their engagement in applied research and explore new opportunities for growth.

Our investigation shows there is no one right way to develop an applied research and innovation mindset within VET centres and SMEs. Each country has its education system and policies on AR&I. The Netherlands, a decentralised country, and Türkiye, which follows a centralised approach are cases in point. The results reflect a global growing awareness of the benefits of AR&I for society, which is being translated into policies and measures. However, their impact is limited by barriers that transcend borders. The lack of resources, framework, time, funding, and experience undermines VET centres' engagement in AR&I projects. However, what VET centres lack most is visibility. They are still too rarely considered as research partners by the companies and remain too often in the shadow of higher education institutions. Developing an AR&I mindset within VET centres goes further than supporting projects that have been set up.

It requires redefining the mission of VET centres from an educational institution to an educational institution AND centre of applied research and innovation, which can be promoted as an integrated knowledge centre. In concrete terms, this means giving manager teams and teachers at VET centres the resources and support they need in a framed way. SMEs on the other hand need to be made aware of the benefits of AR&I by VET for their business activity. The stakes are high; SMEs must anticipate tomorrow's challenges to remain competitive and to fulfil the digital, energy and circular transition that touches every sector including manufacturing, agriculture, and construction.

As a first step to get attention and promote the value of AR&I, the AIRinVET project partners have made engagement videos for SMEs and VET centres adapted to their regional contexts to raise awareness about AR&I. The videos can be found on the AIRinVET project website: www.airinvet.eu
In addition to the promotion of AR&I, our investigation shows that there is a great need for coordination between the various players involved. AR&I activities must be framed and supported by national, regional, and local authorities to flourish.

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APPENDIX 1 – SURVEY ON APPLIED RESEARCH IN VOCATIONAL EDUCATION & TRAINING – SME PERSPECTIVE

The survey can also be viewed online.

Call for participation in the survey on LinkedIn

AIRinVET
162 followers
4mo • Edited •

Is the future of applied research and innovation being held back by unseen barriers? How much do we unknowingly contribute to the gap between VET institutions and businesses?
💉 Take our survey and help pave the way for groundbreaking collaborations.

🔗 Survey Links:
For VET Providers: https://lnkd.in/ecZagKuk
For Companies: https://lnkd.in/e2F72v8s

📌 Our survey seeks to uncover the mindsets and barriers affecting collaborations between VET institutions and businesses in applied research activities.
→ Time Required: 8-10 minutes
→ The survey is available in English, Dutch, Spanish, and German!

TKNIKA ISSO, kennisinstituut bouw- en installatietechniek Wij zijn Katapult Hanse-Parlament AFM Advanced Manufacturing Technologies Berufliche Hochschule Hamburg (BHH) EURASHE IMH Campus

#AIRinVET #VocationalEducation #Training #AppliedInnovation #Research #SMEs #Innovation #EUvocationalexcellence #copcoves #erasmus #europeanyearofskills

SME perspective survey in Pdf version

Applied Research in Vocational education & training - SME perspective

Welcome

Hello and thank you for taking time to fill out this questionnaire!

In the frame of the Erasmus+ co-funded project **AIRinVET**, we are conducting a survey to gain insights into the experiences and perspectives of small and medium-sized enterprises (SMEs) regarding applied research and innovation activities in collaboration with educational institutions. By "applied research and innovation activities" we mean the practical and systematic approach to solve real-world problems and improve existing technologies or processes.

Please take 8-10 minutes to respond to the following questions. For your convenience, the questionnaire is available in English, Dutch, Spanish and German. You can switch the language in the upper right corner. Your participation is highly valuable to us, as it will contribute to a better understanding of the current landscape and potential opportunities for collaboration.
Your responses will be kept strictly confidential and used for research purposes only.

Thank you for your contribution!

* 1. Please indicate where the company you work for is based

2. Please indicate the region/state/province the company is based at

* 3. Please indicate what applies to you most

- ◯ I am a company employee
- ◯ I am a company manager
- ◯ I am a company owner
- ◯ Other (please specify)

* 4. How many people work in your company?

- ◯ 1-9
- ◯ 10-49
- ◯ 50-250
- ◯ more than 250

* 5. In which sector or industry is your company operating? (multiple answers possible)

The sectors are listed according to the European statistical classification of economic activities NACE.

- [ ] A - Agriculture, forestry and fishing
- [ ] B - Mining and quarrying
- [ ] C - Manufacturing
- [ ] D - Electricity, gas, steam and air conditioning supply
- [ ] E - Water supply; sewerage, waste management and remediation activities
- [ ] F - Construction
- [ ] G - Wholesale and retail trade; repair of motor vehicles and motorcycles
- [ ] H - Transportation and storage
- [ ] I - Accommodation and food service activities
- [ ] J - Information and communication
- [ ] K - Financial and insurance activities
- [ ] L - Real estate activities
- [ ] M - Professional, scientific and technical activities
- [ ] N - Administrative and support service activities
- [ ] O - Public administration and defence; compulsory social security
- [ ] P - Education
- [ ] Q - Human health and social work activities
- [ ] R - Arts, entertainment and recreation
- [ ] S - Other service activities
- [ ] T - Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use
- [ ] U - Activities of extraterritorial organisations and bodies
- [ ] Other (please specify)

* 6. Since when is your company operating?

- ◯ less than 5 years
- ◯ 5 years or more

* 7. Who are the main customers of your company (multiple answers possible)

- [ ] Private customers (B2C)
- [ ] Other companies, private businesses (B2B)
- [ ] Government, public administration (B2G)
- [ ] Other (please specify)

Applied Research and Innovation activities

* 8. Has your company engaged in any applied research and innovation activities (e.g. product development, process optimization, market analysis, technology advancement, etc.)?

- ◯ Yes
- ◯ No

Applied Research and Innovation experience

* 9. What kind of applied research and innnovation activities has your company undertaken? (multiple answers possible)

- [ ] Product development
- [ ] Process optimization
- [ ] Market analysis
- [ ] Technology advancement
- [ ] Other (please specify)

* 10. Could you provide examples of the outputs or tangible solutions that were developed through these applied research activities? (multiple answers possible)

- [ ] New product prototypes
- [ ] Streamlined production processes
- [ ] Market reports and insights
- [ ] Improved software algorithms
- [ ] Program impact assessments
- [ ] Other (please specify)

* 11. How would you rate the overall experience of engaging in applied research within your company?

	Highly positive	Positive	Neutral	Challenging	Highly challenging
The applied research and inovation activity was...	○	○	○	○	○

* 12. What kind of funding did your company use for the applied research activities? (multiple answers possible)

- [ ] Government grants
- [ ] Private investors
- [ ] Research partnerships
- [ ] Internal funding
- [ ] Other (please specify)

* 13. Which stakeholders were involved in the applied research and innovation activities? (multiple answers possible)

- [ ] Internal company teams/departments
- [ ] External industry experts/consultants
- [ ] Students
- [ ] Government agencies
- [ ] Academic researchers
- [ ] End-users or customers
- [ ] Other (please specify)

* 14. Have you collaborated with any educational institutions (e.g., Universities of Applied Sciences, Colleges, Vocational education schools) on applied research or innovation projects?

- ◯ Yes
- ◯ No

Applied Research in Vocational education & training - SME perspective

Collaboration

* 15. With what kind of educational institution did you carry out applied research and innovation activities? (multiple answers possible)

- [ ] University
- [ ] University of Applied Sciences
- [ ] College
- [ ] VET school
- [ ] Independent research organisation
- [ ] Other (please specify)

* 16. How would you rate the overall collaboration experience with educational institutions on applied research and innovation projects?

Poor	Below average	Average	Good	Excellent
★	★	★	★	★

* 17. How would you rate the key enablers that can contribute to a successful applied research collaboration between VET institutions and companies?

Please rate the following key enablers on a scale from 1 to 5

	Not Important	Somewhat Important	Neutral	Important	Very Important
Clear communication channels	○	○	○	○	○
Complementary expertise and resources	○	○	○	○	○
Effective project management	○	○	○	○	○
Timely and reliable deliverables	○	○	○	○	○
Strong commitment from both parties	○	○	○	○	○

Other (please specify)

* 18. Would you consider collaborating with an educational institution on future applied research projects?

	Not at all	Unlikely	Undecided	Probably	Definitely
Would you consider collaborating with an educational institution on future applied research projects?	◯	◯	◯	◯	◯

* 19. Please rate how important the following aspects were for the success of the partnership between your company and the educational institution in the applied research project?

	Not Important	Somewhat Important	Neutral	Important	Very Important
Alignment of goals and objectives	◯	◯	◯	◯	◯
Open and collaborative culture	◯	◯	◯	◯	◯
Adequate funding and resources	◯	◯	◯	◯	◯
Well-defined roles and responsibilities	◯	◯	◯	◯	◯
Regular progress monitoring and evaluation	◯	◯	◯	◯	◯

Other (please specify)

Future considerations

* 20. Please rate specific barriers or challenges that you perceive in initiating a collaboration with an educational institution on applied research projects?

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Lack of awareness about potential collaborations	○	○	○	○	○
Cultural differences between education institutions and industry	○	○	○	○	○
Administrative and contractual complexities	○	○	○	○	○
Time and resource constraints	○	○	○	○	○
Difficulty in finding suitable educational institutions	○	○	○	○	○
Unclear benefits or relevance to company goals	○	○	○	○	○
Intellectual property concerns	○	○	○	○	○

Other (please specify)

* 21. What kind of applied research and innnovation activities would you consider untertaking in the future? (multiple answers possible)

- ☐ Product development
- ☐ Process optimization
- ☐ Market analysis
- ☐ Technology advancement
- ☐ Social program evaluation
- ☐ None of the above
- ☐ Other (please specify)

* 22. Please rate the importance of specific conditions for your company to consider collaborating with an educational institution on applied research projects are?

	Not Important	Somewhat Important	Neutral	Important	Very Important
Clear guidelines for intellectual property rights	○	○	○	○	○
Access to specialized facilities or equipment	○	○	○	○	○
Funding or financial incentives	○	○	○	○	○
Strong support from top management	○	○	○	○	○
Alignment of research interests with company goals	○	○	○	○	○
Opportunity to connect with future employees/recruiting talent	○	○	○	○	○

Other (please specify)

* 23. Would you consider VET schools as applied research and innovation suppliers?

Unsure/No opinion	Not valuable or relevant	Somewhat valuable, but with limited potential	Highly valuable and innovative
☆	☆	☆	☆

* 24. Please rate the aspects that would motivate you to collaborate with VET schools or centers?

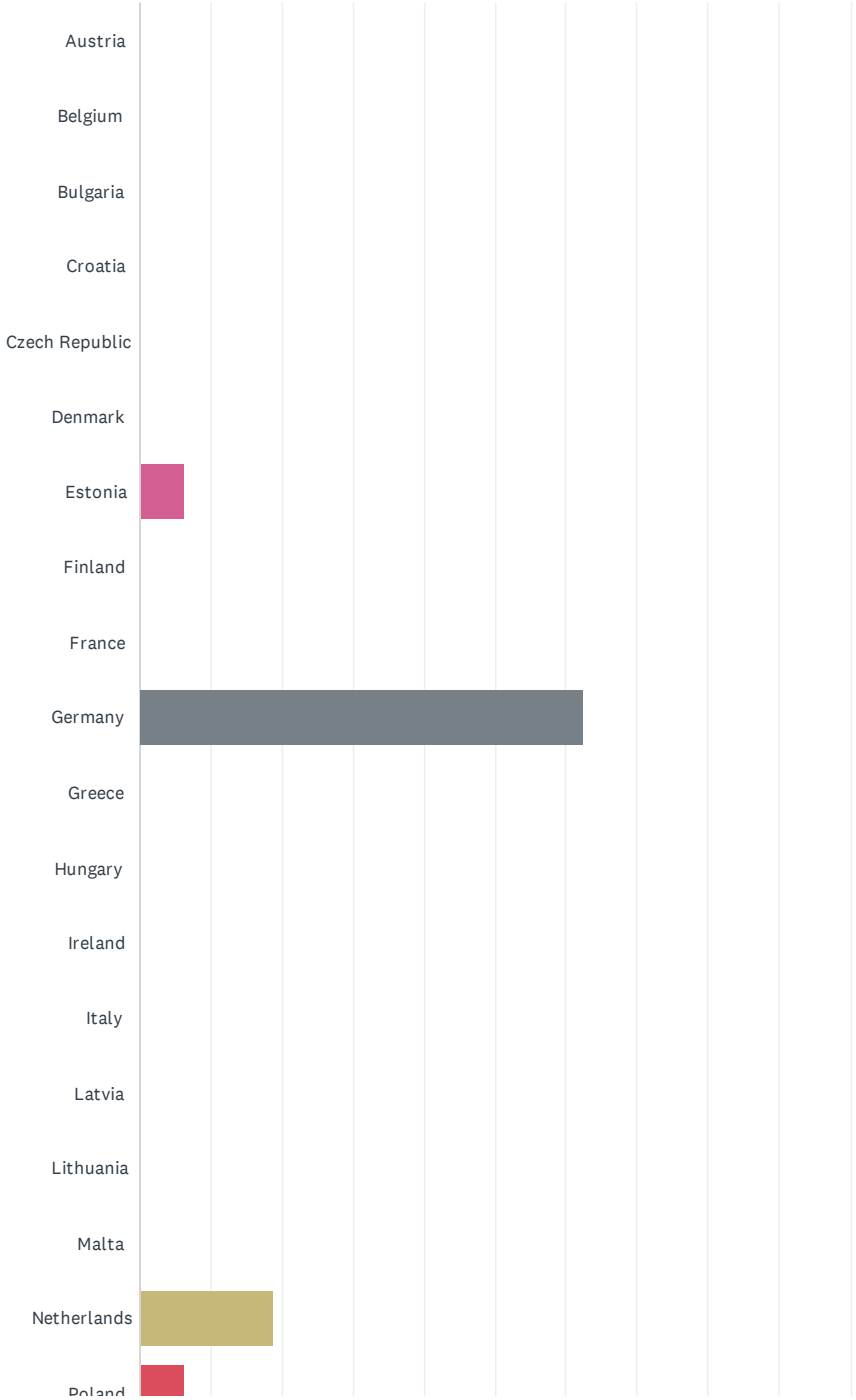
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Access to specialized knowledge and expertise	○	○	○	○	○
Access to equipment	○	○	○	○	○
Potential for innovative solutions to business challenges	○	○	○	○	○
Opportunities for knowledge exchange and networking	○	○	○	○	○
Access to funding or grants for collaborative projects	○	○	○	○	○
Enhanced reputation and visibility in the industry	○	○	○	○	○

Other (please specify)

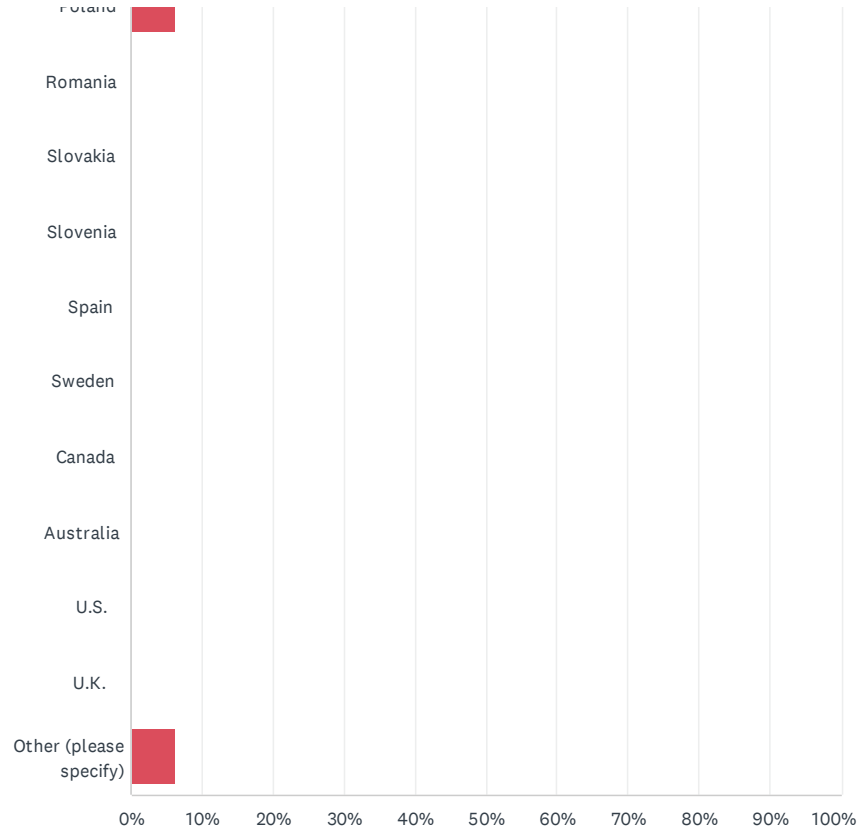
Applied Research in Vocational education & training - SME perspective

Q1 Please indicate where the company you work for is based

Answered: 16 Skipped: 0



1 / 36


Poland
Romania
Slovakia
Slovenia
Spain
Sweden
Canada
Australia
U.S.
U.K.
Other (please specify)
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%

ANSWER CHOICES	RESPONSES	
Austria	0.00%	0
Belgium	0.00%	0
Bulgaria	0.00%	0
Croatia	0.00%	0
Czech Republic	0.00%	0
Denmark	0.00%	0
Estonia	6.25%	1
Finland	0.00%	0
France	0.00%	0
Germany	62.50%	10
Greece	0.00%	0
Hungary	0.00%	0
Ireland	0.00%	0
Italy	0.00%	0
Latvia	0.00%	0
Lithuania	0.00%	0
Malta	0.00%	0
Netherlands	18.75%	3
Poland	6.25%	1
Romania	0.00%	0
Slovakia	0.00%	0
Slovenia	0.00%	0
Spain	0.00%	0
Sweden	0.00%	0
Canada	0.00%	0
Australia	0.00%	0
U.S.	0.00%	0
U.K.	0.00%	0
Other (please specify)	6.25%	1
TOTAL		16

#	OTHER (PLEASE SPECIFY)	DATE
1	TEST	11/2/2023 3:13 PM

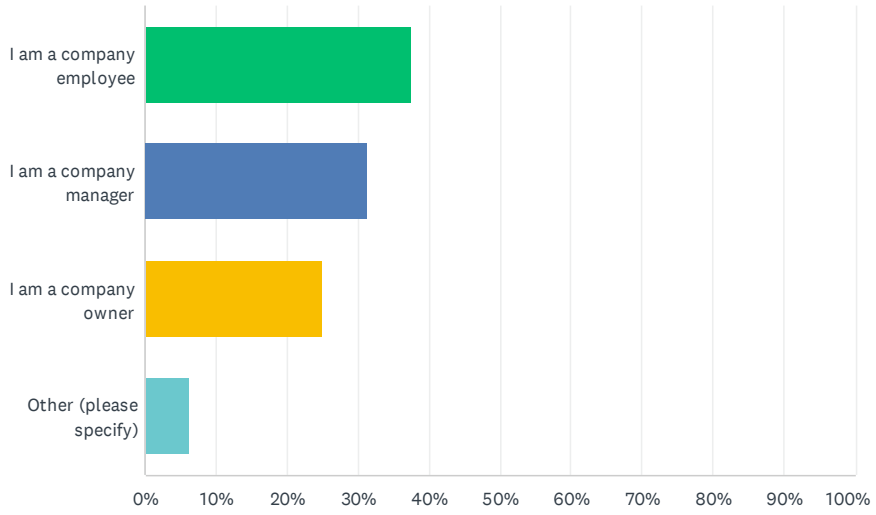
Q2 Please indicate the region/state/province the company is based at

Answered: 13 Skipped: 3

#	RESPONSES	DATE
1	Mecklenburg-Vorpommern	11/19/2023 12:14 PM
2	test	11/2/2023 3:13 PM
3	Gydnia	10/16/2023 3:28 PM
4	Tallinn	10/10/2023 1:56 PM
5	Niedersachsen	10/10/2023 11:19 AM
6	Sachsen	10/9/2023 1:40 PM
7	Utrecht	10/2/2023 7:47 AM
8	Berlin	9/30/2023 1:51 PM
9	Sachsen	9/29/2023 11:18 AM
10	Friesland	9/28/2023 12:05 AM
11	Schleswig-Holstein	9/27/2023 3:32 PM
12	Berlin	9/25/2023 6:03 PM
13	zuid holland	9/21/2023 1:58 PM

Q3 Please indicate what applies to you most

Answered: 16 Skipped: 0

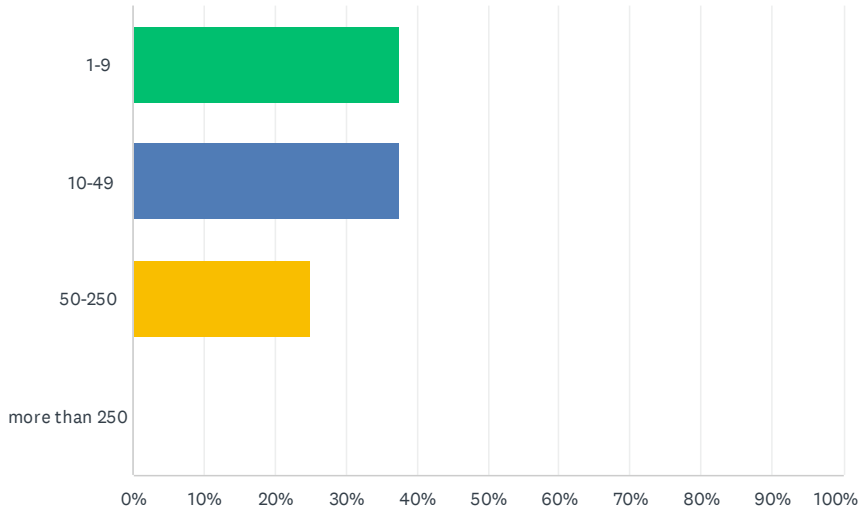


ANSWER CHOICES	RESPONSES	
I am a company employee	37.50%	6
I am a company manager	31.25%	5
I am a company owner	25.00%	4
Other (please specify)	6.25%	1
TOTAL		16

#	OTHER (PLEASE SPECIFY)	DATE
1	Advisor for VTE	9/30/2023 1:51 PM

Q4 How many people work in your company?

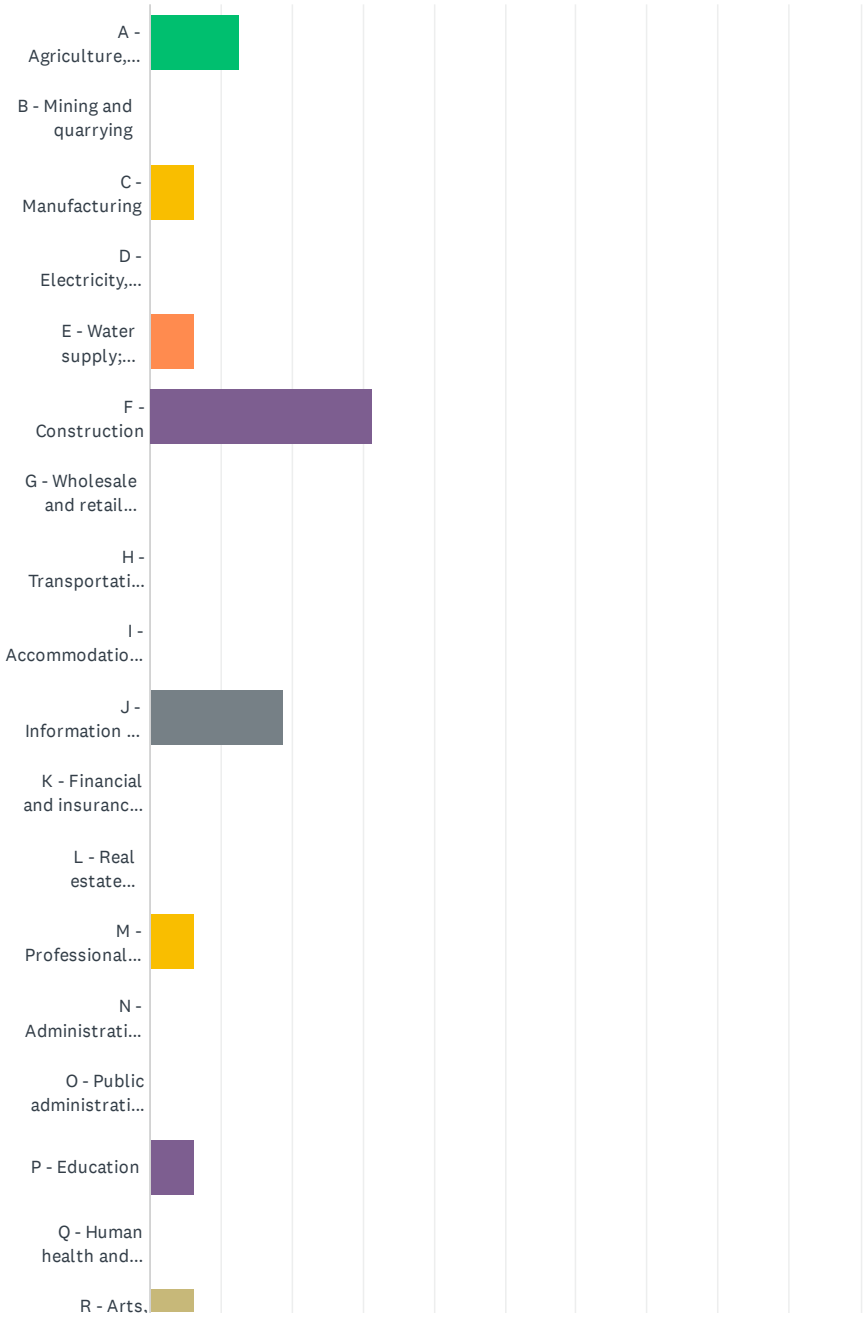
Answered: 16 Skipped: 0

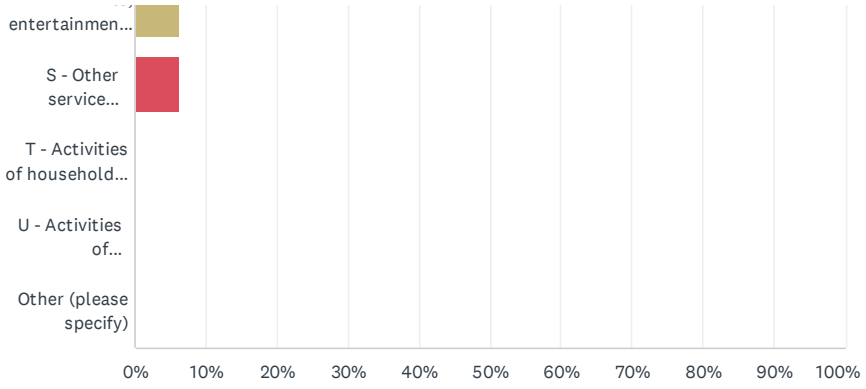


ANSWER CHOICES	RESPONSES	
1-9	37.50%	6
10-49	37.50%	6
50-250	25.00%	4
more than 250	0.00%	0
TOTAL		16

Q5 In which sector or industry is your company operating? (multiple answers possible)The sectors are listed according to the European statistical classification of economic activities NACE.

Answered: 16 Skipped: 0



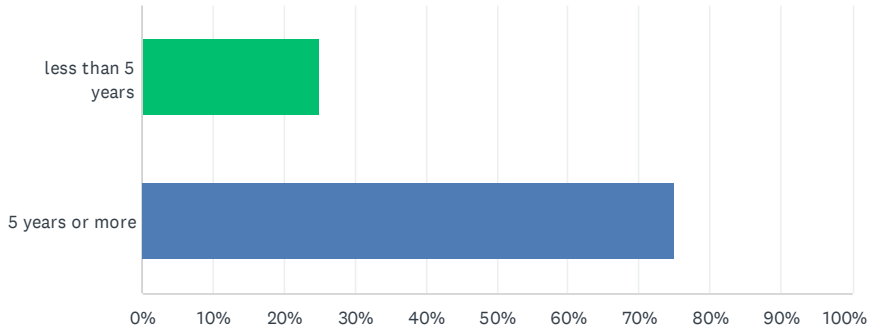

entertainmen...
S - Other service...
T - Activities of household...
U - Activities of...
Other (please specify)
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%

ANSWER CHOICES	RESPONSES	
A - Agriculture, forestry and fishing	12.50%	2
B - Mining and quarrying	0.00%	0
C - Manufacturing	6.25%	1
D - Electricity, gas, steam and air conditioning supply	0.00%	0
E - Water supply; sewerage, waste management and remediation activities	6.25%	1
F - Construction	31.25%	5
G - Wholesale and retail trade; repair of motor vehicles and motorcycles	0.00%	0
H - Transportation and storage	0.00%	0
I - Accommodation and food service activities	0.00%	0
J - Information and communication	18.75%	3
K - Financial and insurance activities	0.00%	0
L - Real estate activities	0.00%	0
M - Professional, scientific and technical activities	6.25%	1
N - Administrative and support service activities	0.00%	0
O - Public administration and defence; compulsory social security	0.00%	0
P - Education	6.25%	1
Q - Human health and social work activities	0.00%	0
R - Arts, entertainment and recreation	6.25%	1
S - Other service activities	6.25%	1
T - Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use	0.00%	0
U - Activities of extraterritorial organisations and bodies	0.00%	0
Other (please specify)	0.00%	0
Total Respondents: 16		

#	OTHER (PLEASE SPECIFY)	DATE
	There are no responses.	

Q6 Since when is your company operating?

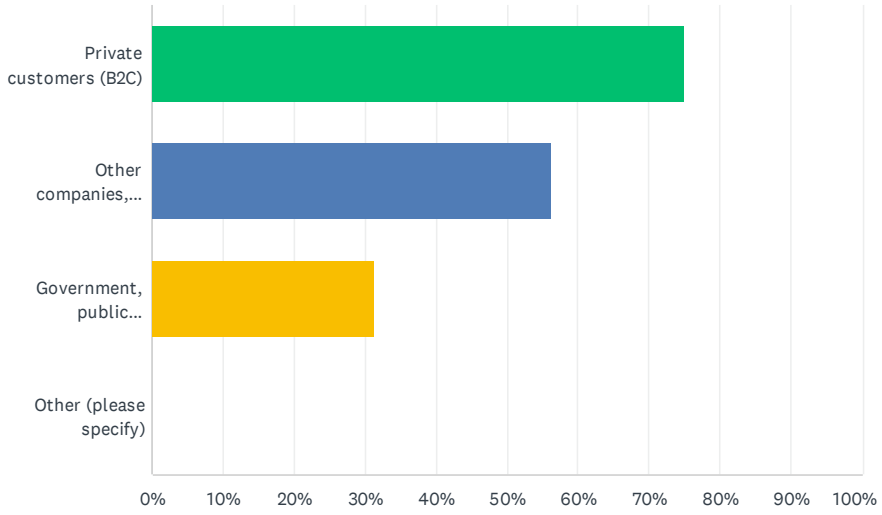
Answered: 16 Skipped: 0



ANSWER CHOICES	RESPONSES	
less than 5 years	25.00%	4
5 years or more	75.00%	12
TOTAL		16

Q7 Who are the main customers of your company (multiple answers possible)

Answered: 16 Skipped: 0

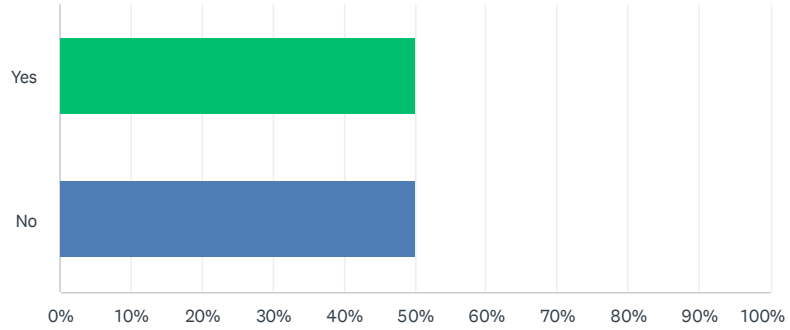


ANSWER CHOICES	RESPONSES	
Private customers (B2C)	75.00%	12
Other companies, private businesses (B2B)	56.25%	9
Government, public administration (B2G)	31.25%	5
Other (please specify)	0.00%	0
Total Respondents: 16		

#	OTHER (PLEASE SPECIFY)	DATE
	There are no responses.	

Q8 Has your company engaged in any applied research and innovation activities (e.g. product development, process optimization, market analysis, technology advancement, etc.)?

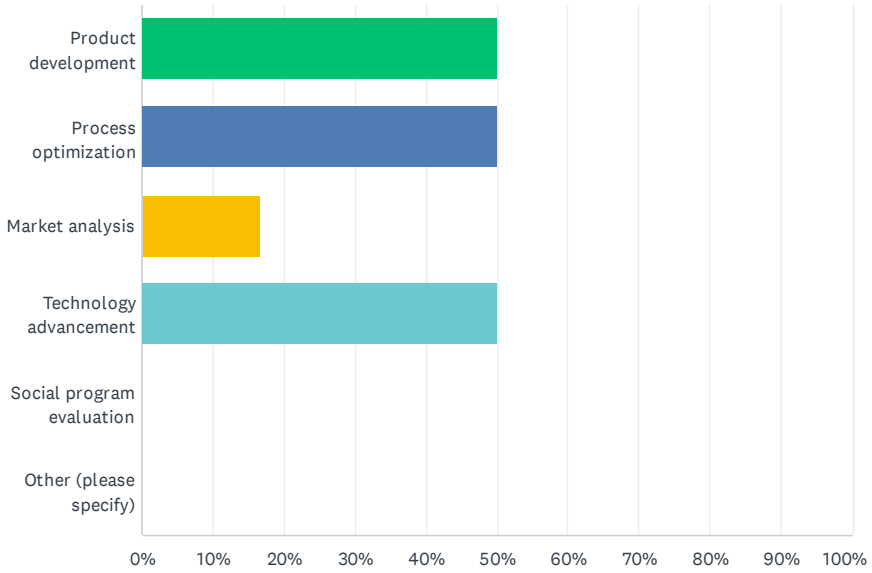
Answered: 16 Skipped: 0



ANSWER CHOICES	RESPONSES	
Yes	50.00%	8
No	50.00%	8
TOTAL		16

Q9 What kind of applied research and innnovation activities has your company undertaken? (multiple answers possible)

Answered: 6 Skipped: 10

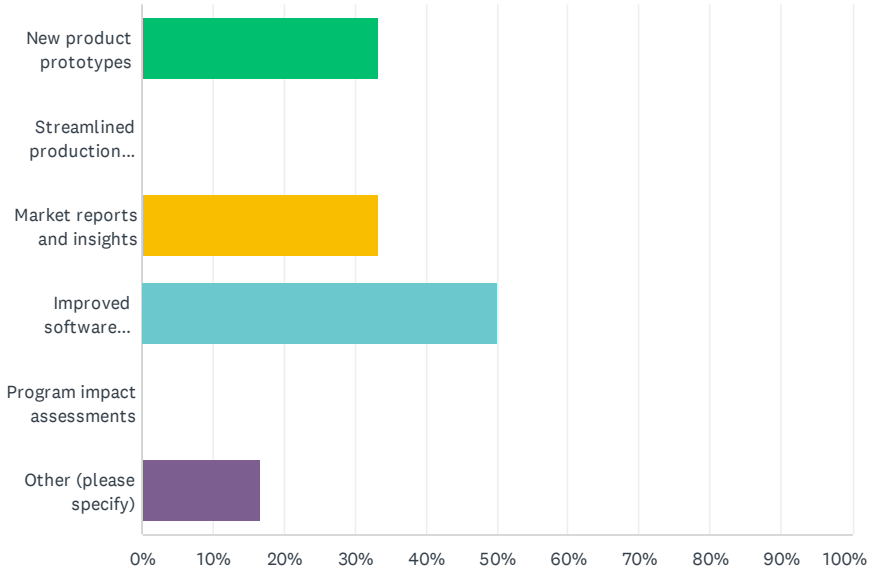


ANSWER CHOICES	RESPONSES	
Product development	50.00%	3
Process optimization	50.00%	3
Market analysis	16.67%	1
Technology advancement	50.00%	3
Social program evaluation	0.00%	0
Other (please specify)	0.00%	0
Total Respondents: 6		

#	OTHER (PLEASE SPECIFY)	DATE
	There are no responses.	

Q10 Could you provide examples of the outputs or tangible solutions that were developed through these applied research activities? (multiple answers possible)

Answered: 6 Skipped: 10

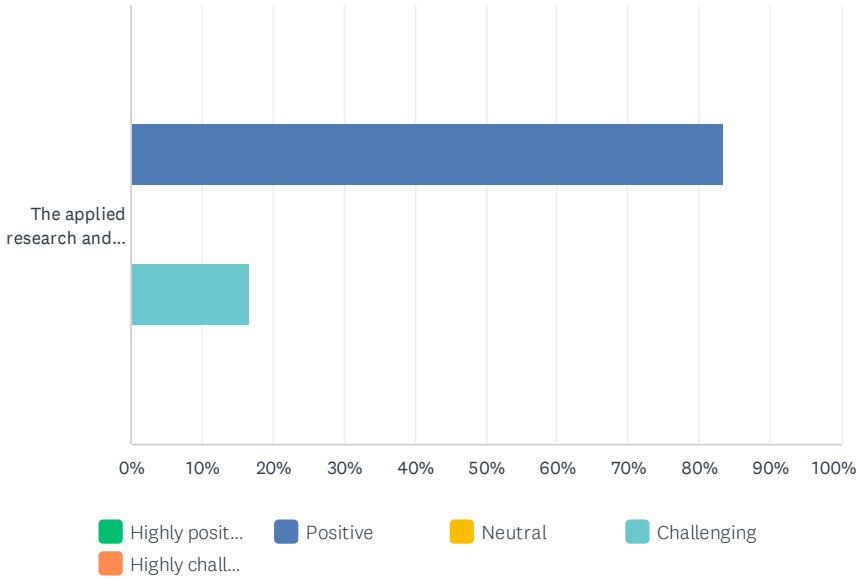


ANSWER CHOICES	RESPONSES	
New product prototypes	33.33%	2
Streamlined production processes	0.00%	0
Market reports and insights	33.33%	2
Improved software algorithms	50.00%	3
Program impact assessments	0.00%	0
Other (please specify)	16.67%	1
Total Respondents: 6		

#	OTHER (PLEASE SPECIFY)	DATE
1	Energy saving in production	9/30/2023 1:53 PM

Q11 How would you rate the overall experience of engaging in applied research within your company?

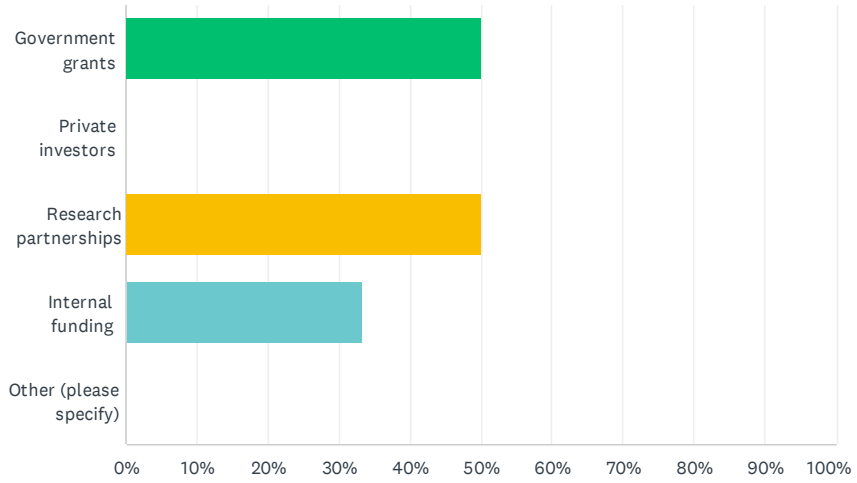
Answered: 6 Skipped: 10



	HIGHLY POSITIVE	POSITIVE	NEUTRAL	CHALLENGING	HIGHLY CHALLENGING	TOTAL	WEIGHTED AVERAGE
The applied research and inovation activity was...	0.00% 0	83.33% 5	0.00% 0	16.67% 1	0.00% 0	6	2.33

Q12 What kind of funding did your company use for the applied research activities? (multiple answers possible)

Answered: 6 Skipped: 10

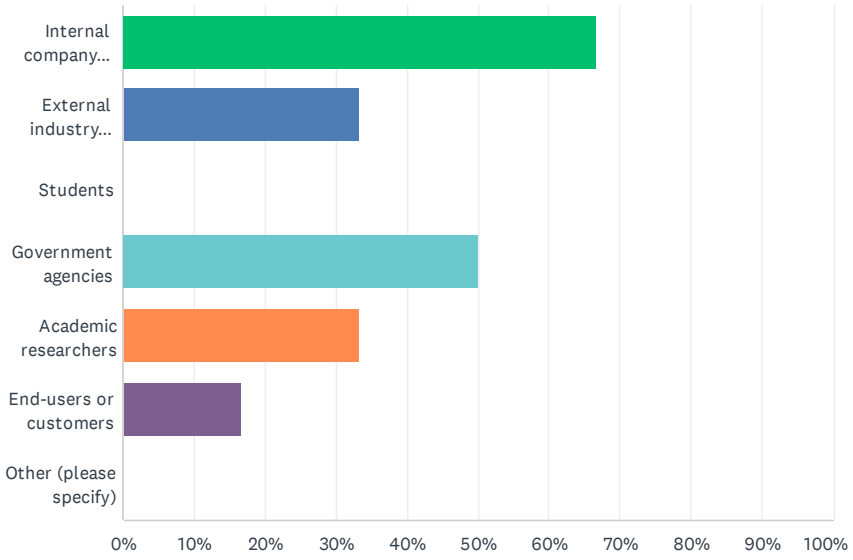


ANSWER CHOICES	RESPONSES	
Government grants	50.00%	3
Private investors	0.00%	0
Research partnerships	50.00%	3
Internal funding	33.33%	2
Other (please specify)	0.00%	0
Total Respondents: 6		

#	OTHER (PLEASE SPECIFY)	DATE
	There are no responses.	

Q13 Which stakeholders were involved in the applied research and innovation activities? (multiple answers possible)

Answered: 6 Skipped: 10

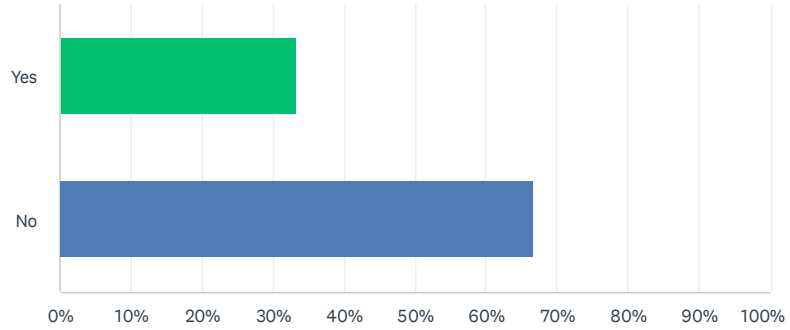


ANSWER CHOICES	RESPONSES	
Internal company teams/departments	66.67%	4
External industry experts/consultants	33.33%	2
Students	0.00%	0
Government agencies	50.00%	3
Academic researchers	33.33%	2
End-users or customers	16.67%	1
Other (please specify)	0.00%	0
Total Respondents: 6		

#	OTHER (PLEASE SPECIFY)	DATE
	There are no responses.	

Q14 Have you collaborated with any educational institutions (e.g., Universities of Applied Sciences, Colleges, Vocational education schools) on applied research or innovation projects?

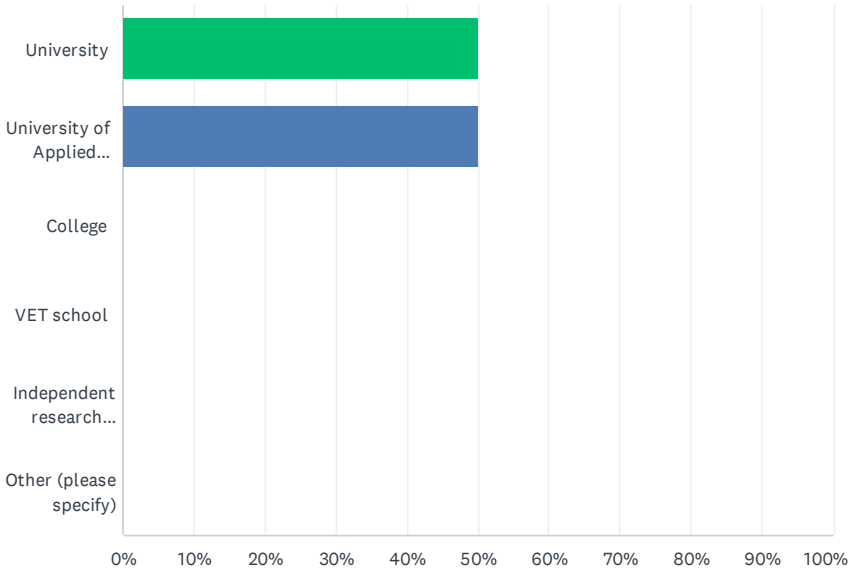
Answered: 6 Skipped: 10



ANSWER CHOICES	RESPONSES	
Yes	33.33%	2
No	66.67%	4
TOTAL		6

Q15 With what kind of educational institution did you carry out applied research and innovation activities? (multiple answers possible)

Answered: 2 Skipped: 14



ANSWER CHOICES	RESPONSES	
University	50.00%	1
University of Applied Sciences	50.00%	1
College	0.00%	0
VET school	0.00%	0
Independent research organisation	0.00%	0
Other (please specify)	0.00%	0
Total Respondents: 2		

#	OTHER (PLEASE SPECIFY)	DATE
	There are no responses.	

Q16 How would you rate the overall collaboration experience with educational institutions on applied research and innovation projects?

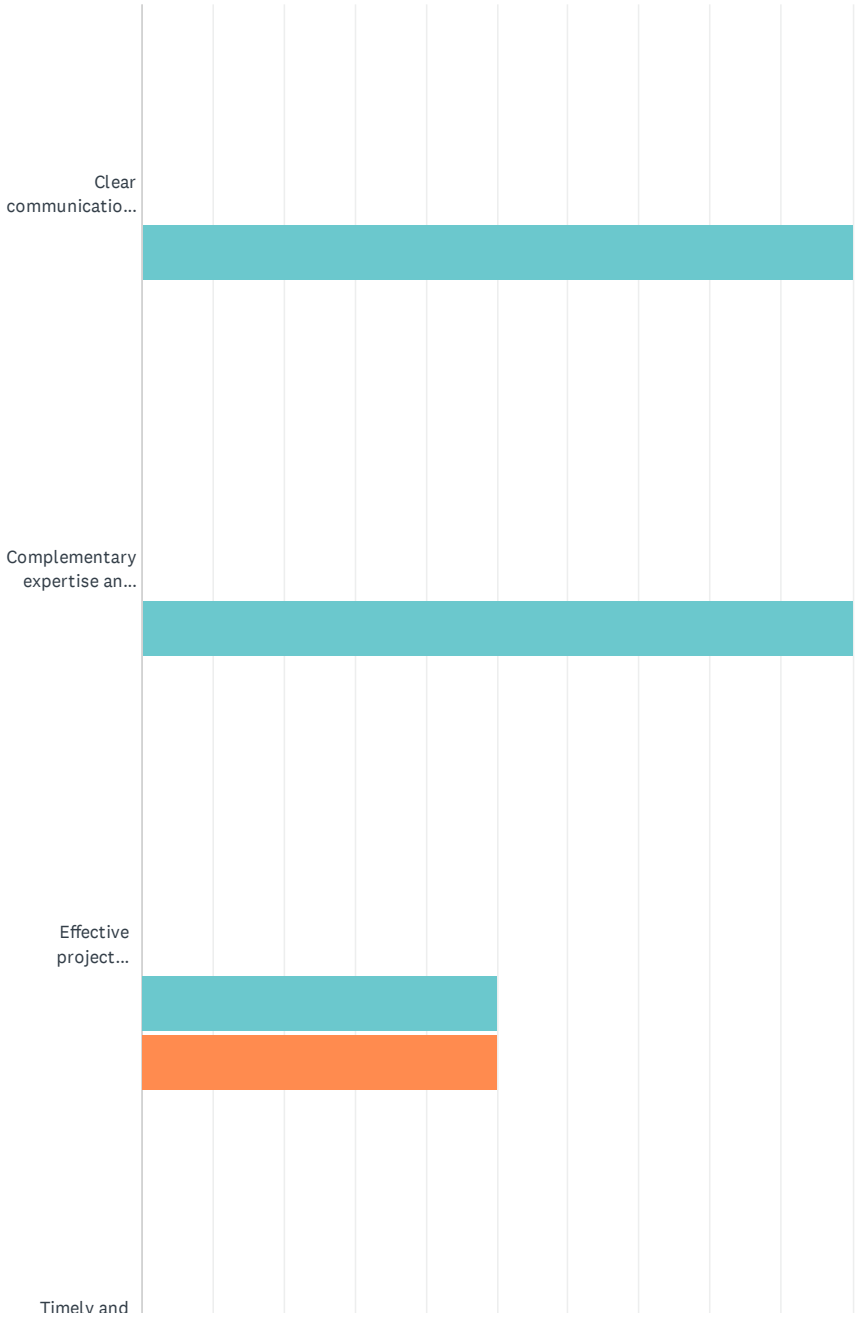
Answered: 2 Skipped: 14

3.5★
average rating

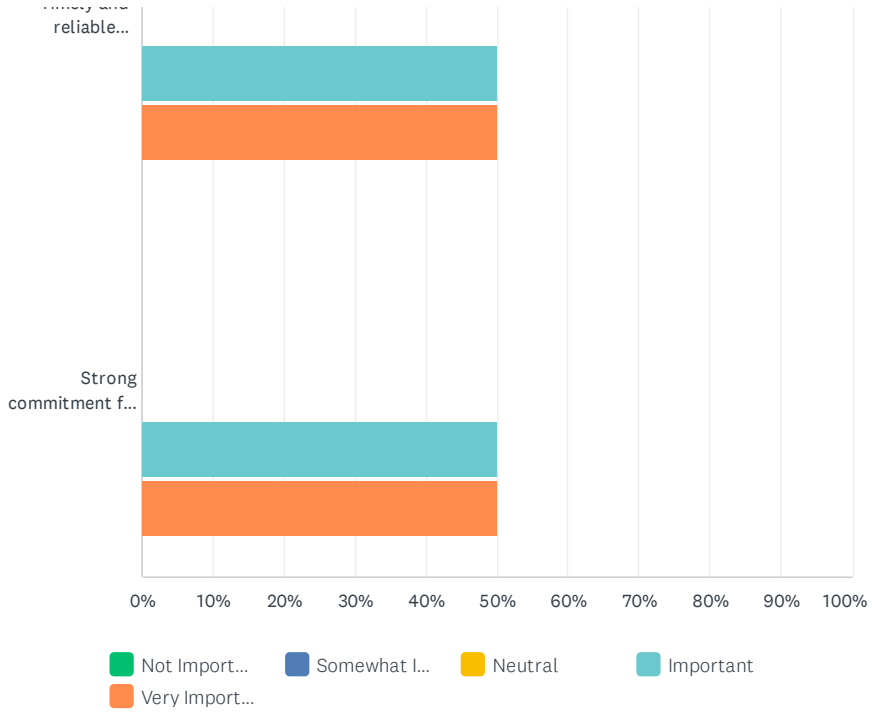
	POOR	BELOW AVERAGE	AVERAGE	GOOD	EXCELLENT	TOTAL	WEIGHTED AVERAGE
☆	0.00% 0	0.00% 0	50.00% 1	50.00% 1	0.00% 0	2	3.50

Q17 How would you rate the key enablers that can contribute to a successful applied research collaboration between VET institutions and companies? Please rate the following key enablers on a scale from 1 to 5

Answered: 2 Skipped: 14



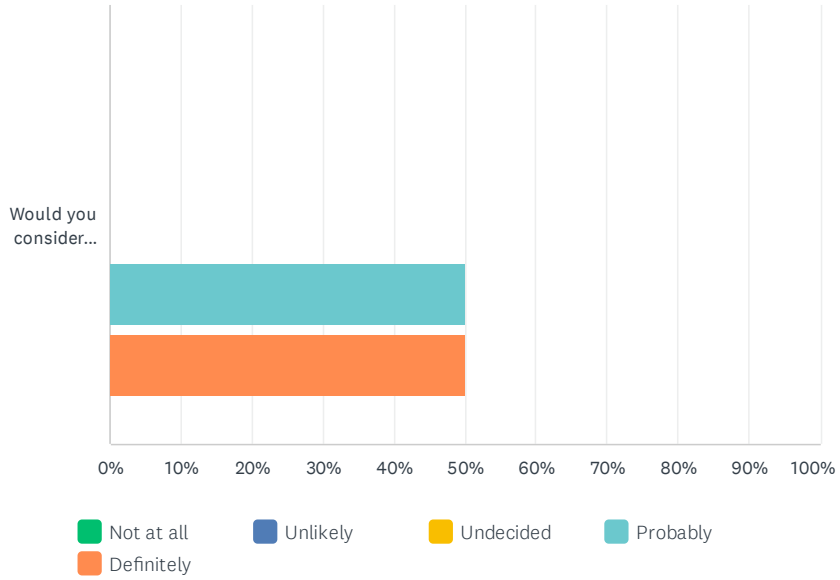
Applied Research in Vocational education & training - SME perspective



	NOT IMPORTANT	SOMEWHAT IMPORTANT	NEUTRAL	IMPORTANT	VERY IMPORTANT	TOTAL	WEIGHTED AVERAGE
Clear communication channels	0.00% 0	0.00% 0	0.00% 0	100.00% 2	0.00% 0	2	4.00
Complementary expertise and resources	0.00% 0	0.00% 0	0.00% 0	100.00% 2	0.00% 0	2	4.00
Effective project management	0.00% 0	0.00% 0	0.00% 0	50.00% 1	50.00% 1	2	4.50
Timely and reliable deliverables	0.00% 0	0.00% 0	0.00% 0	50.00% 1	50.00% 1	2	4.50
Strong commitment from both parties	0.00% 0	0.00% 0	0.00% 0	50.00% 1	50.00% 1	2	4.50

Q18 Would you consider collaborating with an educational institution on future applied research projects?

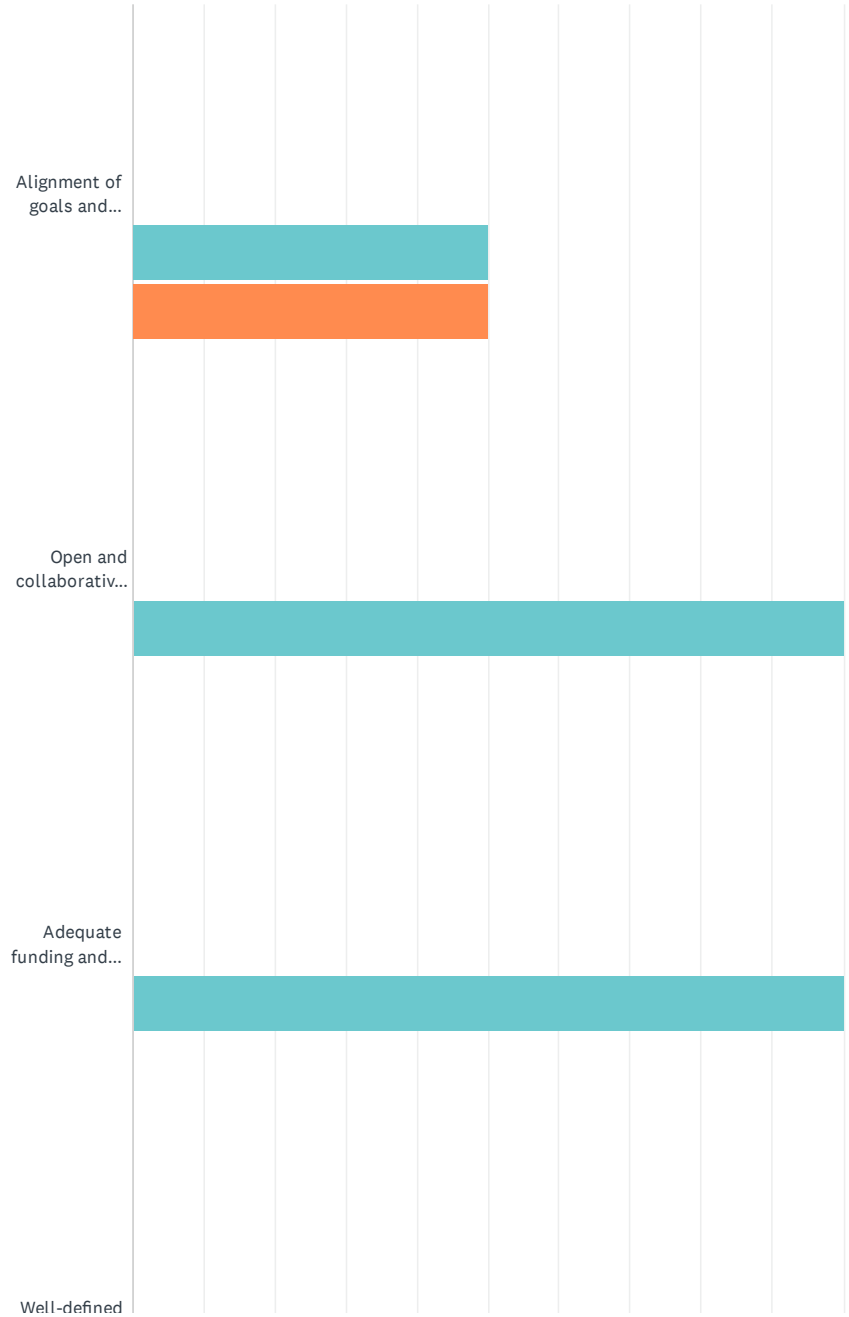
Answered: 2 Skipped: 14



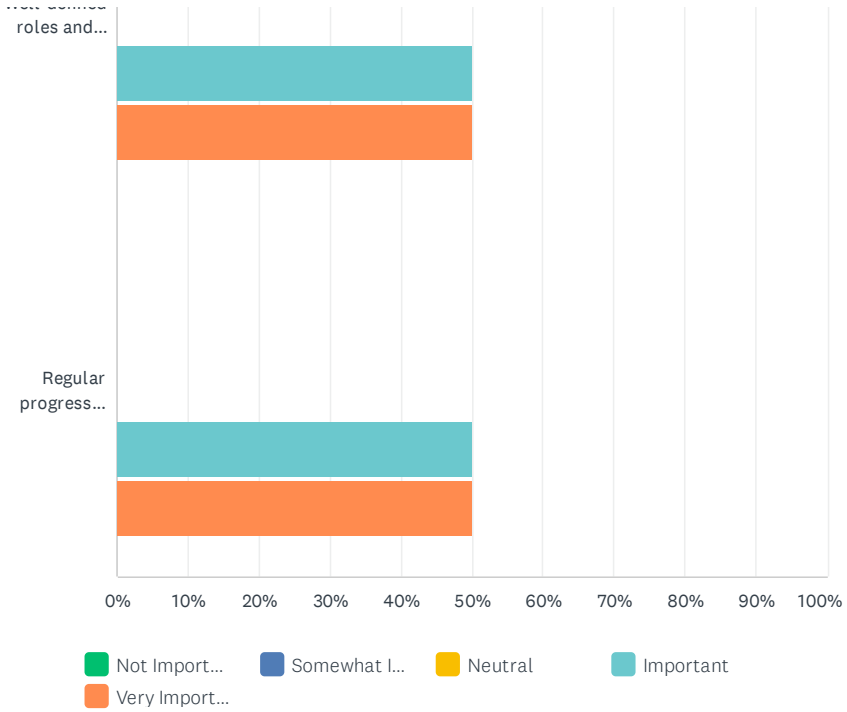
	NOT AT ALL	UNLIKELY	UNDECIDED	PROBABLY	DEFINITELY	TOTAL	WEIGHTED AVERAGE
Would you consider collaborating with an educational institution on future applied research projects?	0.00% 0	0.00% 0	0.00% 0	50.00% 1	50.00% 1	2	4.50

Q19 Please rate how important the following aspects were for the success of the partnership between your company and the educational institution in the applied research project?

Answered: 2 Skipped: 14



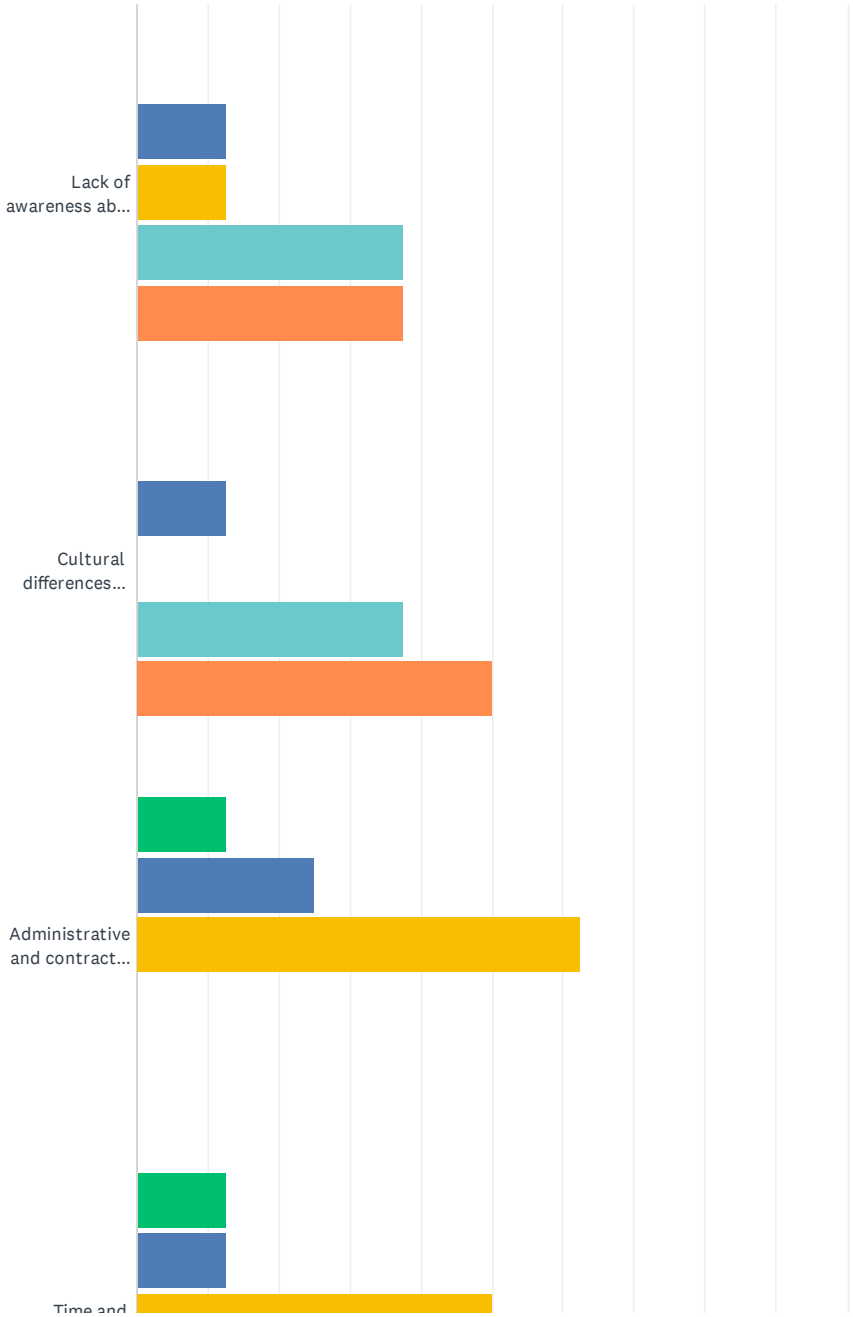
Applied Research in Vocational education & training - SME perspective

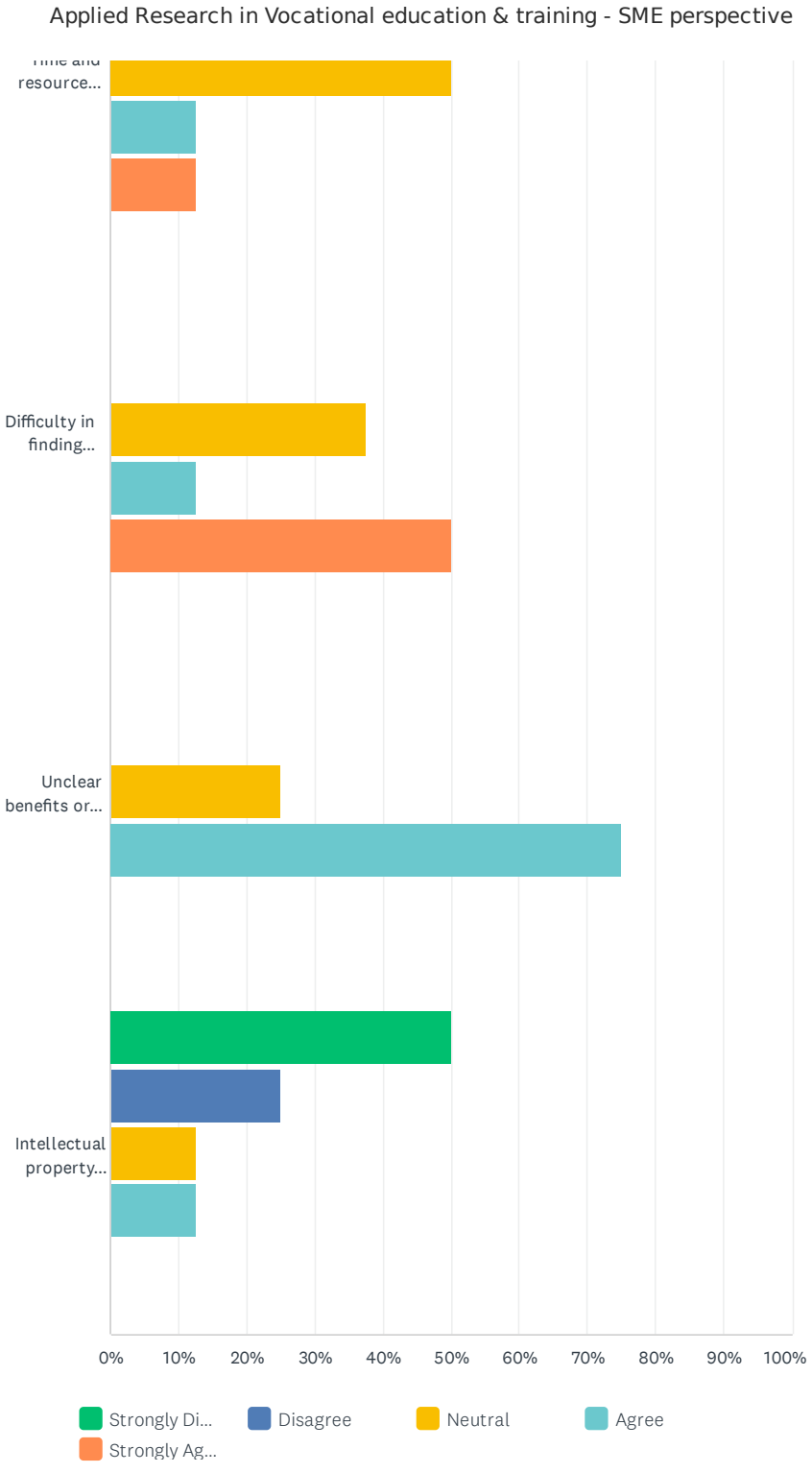


	NOT IMPORTANT	SOMEWHAT IMPORTANT	NEUTRAL	IMPORTANT	VERY IMPORTANT	TOTAL	WEIGHTED AVERAGE
Alignment of goals and objectives	0.00% 0	0.00% 0	0.00% 0	50.00% 1	50.00% 1	2	4.50
Open and collaborative culture	0.00% 0	0.00% 0	0.00% 0	100.00% 2	0.00% 0	2	4.00
Adequate funding and resources	0.00% 0	0.00% 0	0.00% 0	100.00% 2	0.00% 0	2	4.00
Well-defined roles and responsibilities	0.00% 0	0.00% 0	0.00% 0	50.00% 1	50.00% 1	2	4.50
Regular progress monitoring and evaluation	0.00% 0	0.00% 0	0.00% 0	50.00% 1	50.00% 1	2	4.50

Q20 Please rate specific barriers or challenges that you perceive in initiating a collaboration with an educational institution on applied research projects?

Answered: 8 Skipped: 8

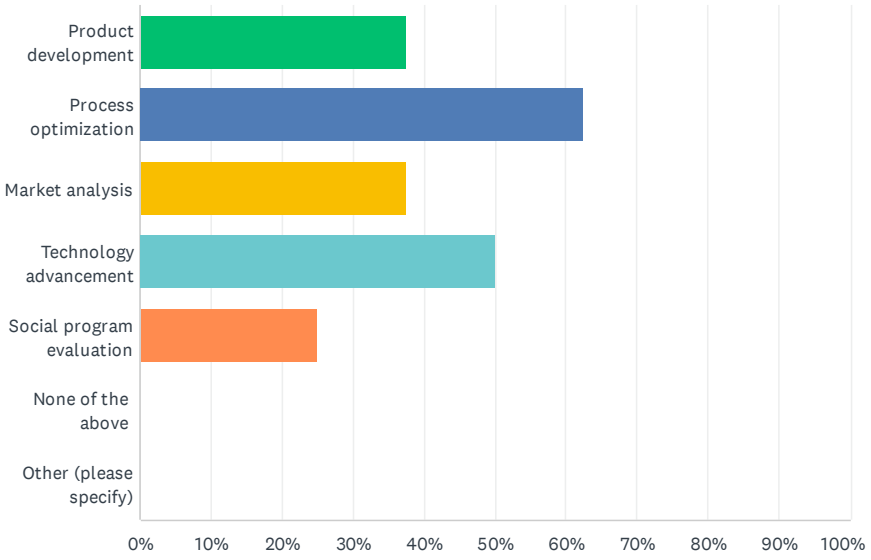



Applied Research in Vocational education & training - SME perspective
Time and resource...
Difficulty in finding...
Unclear benefits or...
Intellectual property...
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Strongly Di...
Disagree
Neutral
Agree
Strongly Ag...

	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE	TOTAL	WEIGHTED AVERAGE
Lack of awareness about potential collaborations	0.00% 0	12.50% 1	12.50% 1	37.50% 3	37.50% 3	8	4.00
Cultural differences between education institutions and industry	0.00% 0	12.50% 1	0.00% 0	37.50% 3	50.00% 4	8	4.25
Administrative and contractual complexities	12.50% 1	25.00% 2	62.50% 5	0.00% 0	0.00% 0	8	2.50
Time and resource constraints	12.50% 1	12.50% 1	50.00% 4	12.50% 1	12.50% 1	8	3.00
Difficulty in finding suitable educational institutions	0.00% 0	0.00% 0	37.50% 3	12.50% 1	50.00% 4	8	4.13
Unclear benefits or relevance to company goals	0.00% 0	0.00% 0	25.00% 2	75.00% 6	0.00% 0	8	3.75
Intellectual property concerns	50.00% 4	25.00% 2	12.50% 1	12.50% 1	0.00% 0	8	1.88

Q21 What kind of applied research and innnovation activities would you consider untertaking in the future? (multiple answers possible)

Answered: 8 Skipped: 8

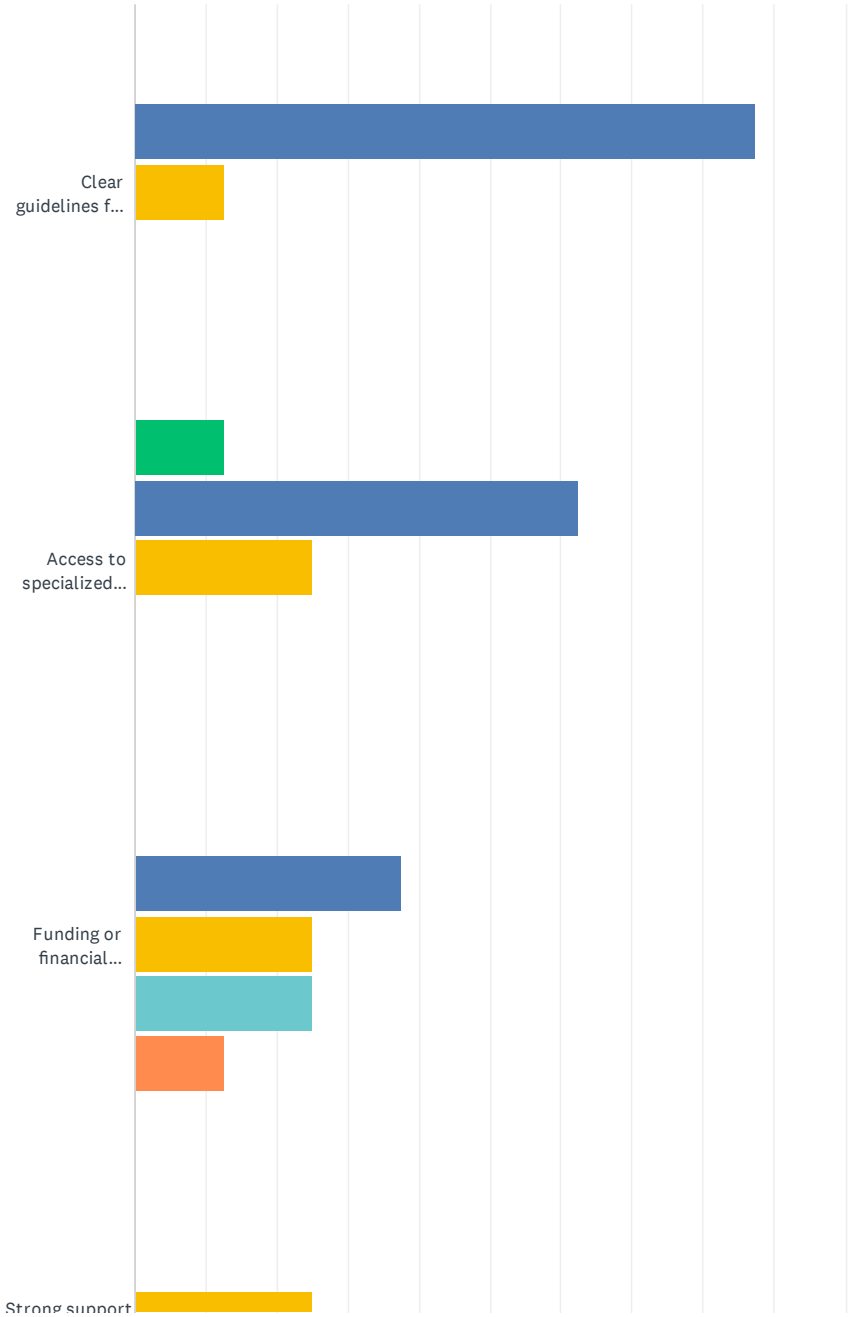


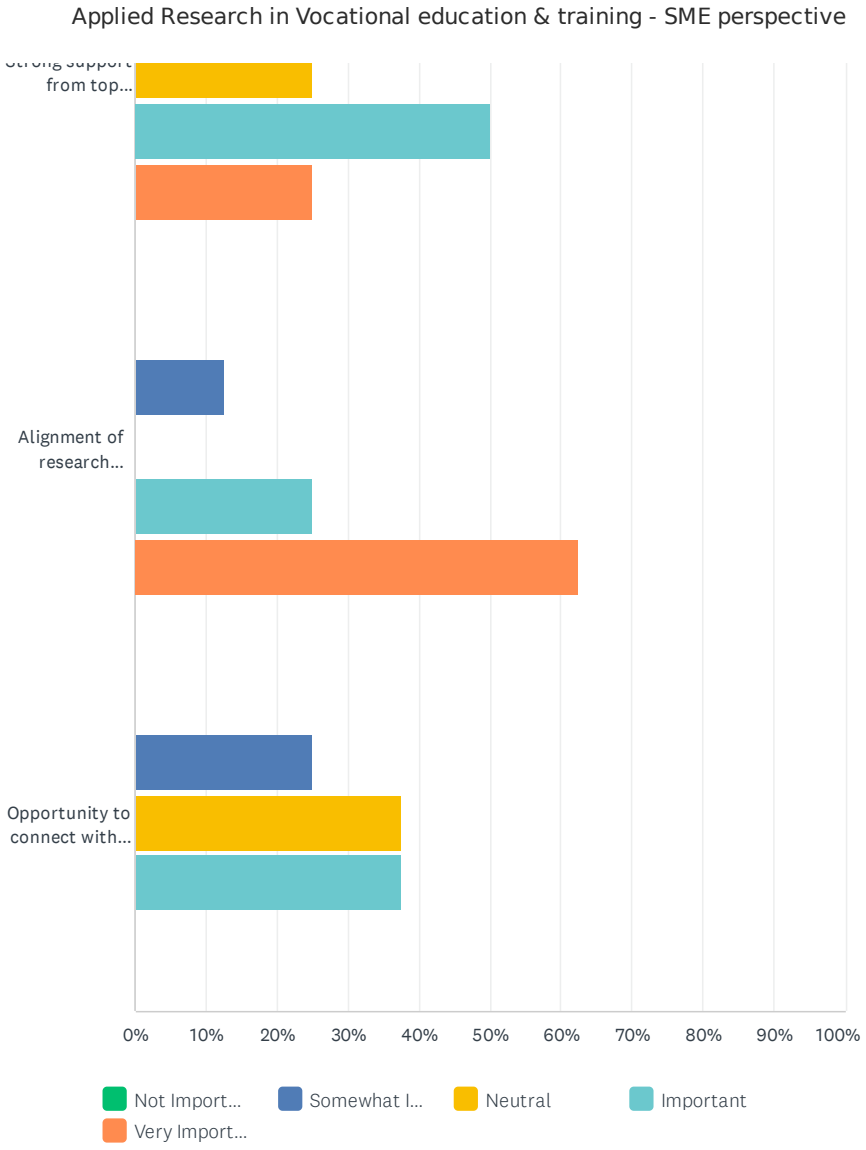
ANSWER CHOICES	RESPONSES	
Product development	37.50%	3
Process optimization	62.50%	5
Market analysis	37.50%	3
Technology advancement	50.00%	4
Social program evaluation	25.00%	2
None of the above	0.00%	0
Other (please specify)	0.00%	0
Total Respondents: 8		

#	OTHER (PLEASE SPECIFY)	DATE
	There are no responses.	

Q22 Please rate the importance of specific conditions for your company to consider collaborating with an educational institution on applied research projects are?

Answered: 8 Skipped: 8

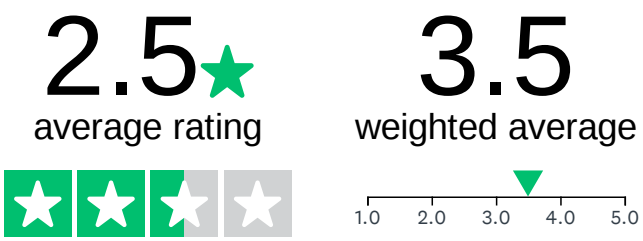



Applied Research in Vocational education & training - SME perspective
from top...
Alignment of research...
Opportunity to connect with...
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Not Import...
Somewhat I...
Neutral
Important
Very Import...

	NOT IMPORTANT	SOMEWHAT IMPORTANT	NEUTRAL	IMPORTANT	VERY IMPORTANT	TOTAL	WEIGHTED AVERAGE
Clear guidelines for intellectual property rights	0.00% 0	87.50% 7	12.50% 1	0.00% 0	0.00% 0	8	2.13
Access to specialized facilities or equipment	12.50% 1	62.50% 5	25.00% 2	0.00% 0	0.00% 0	8	2.13
Funding or financial incentives	0.00% 0	37.50% 3	25.00% 2	25.00% 2	12.50% 1	8	3.13
Strong support from top management	0.00% 0	0.00% 0	25.00% 2	50.00% 4	25.00% 2	8	4.00
Alignment of research interests with company goals	0.00% 0	12.50% 1	0.00% 0	25.00% 2	62.50% 5	8	4.38
Opportunity to connect with future employees/recruiting talent	0.00% 0	25.00% 2	37.50% 3	37.50% 3	0.00% 0	8	3.13

Q23 Would you consider VET schools as applied research and innovation suppliers?

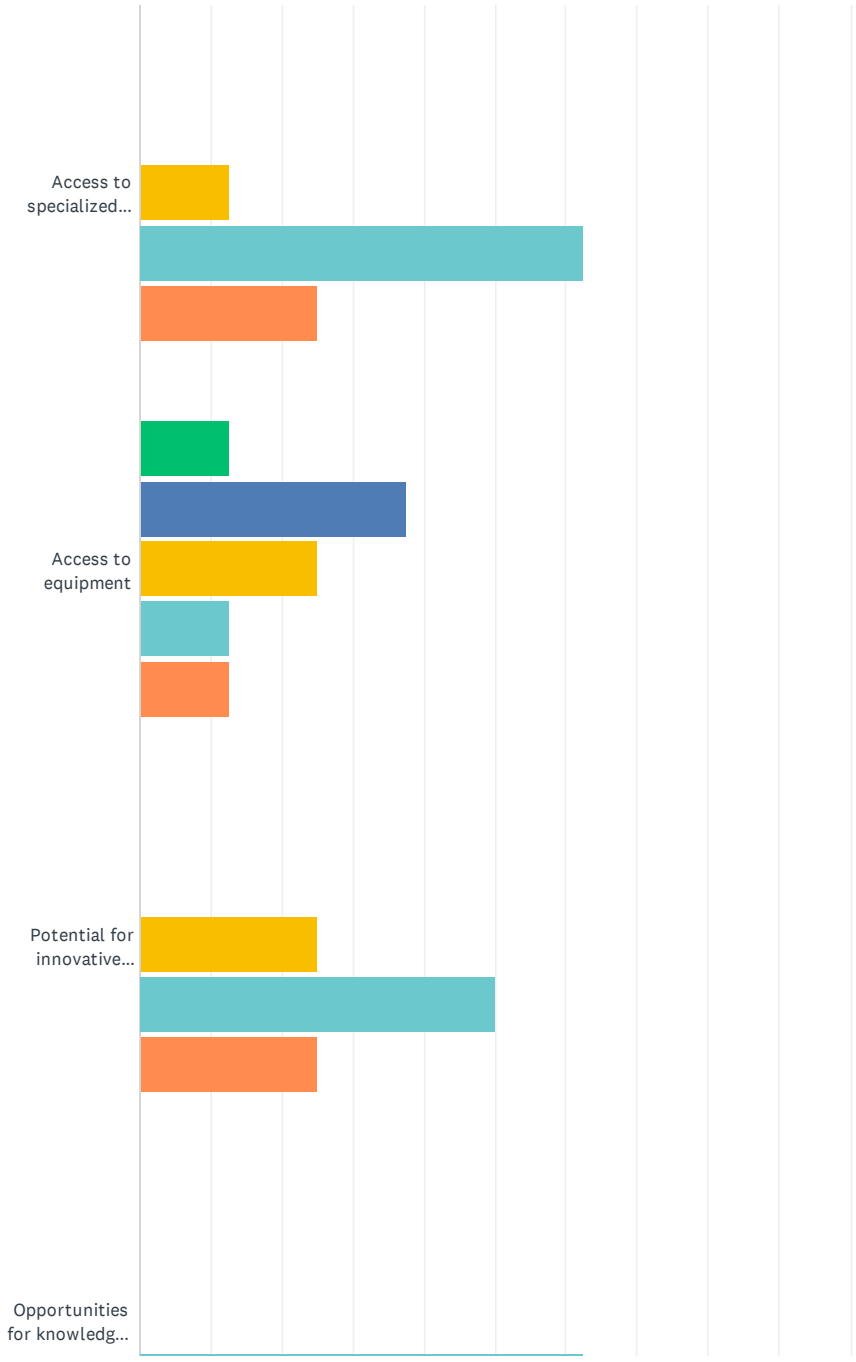
Answered: 8 Skipped: 8



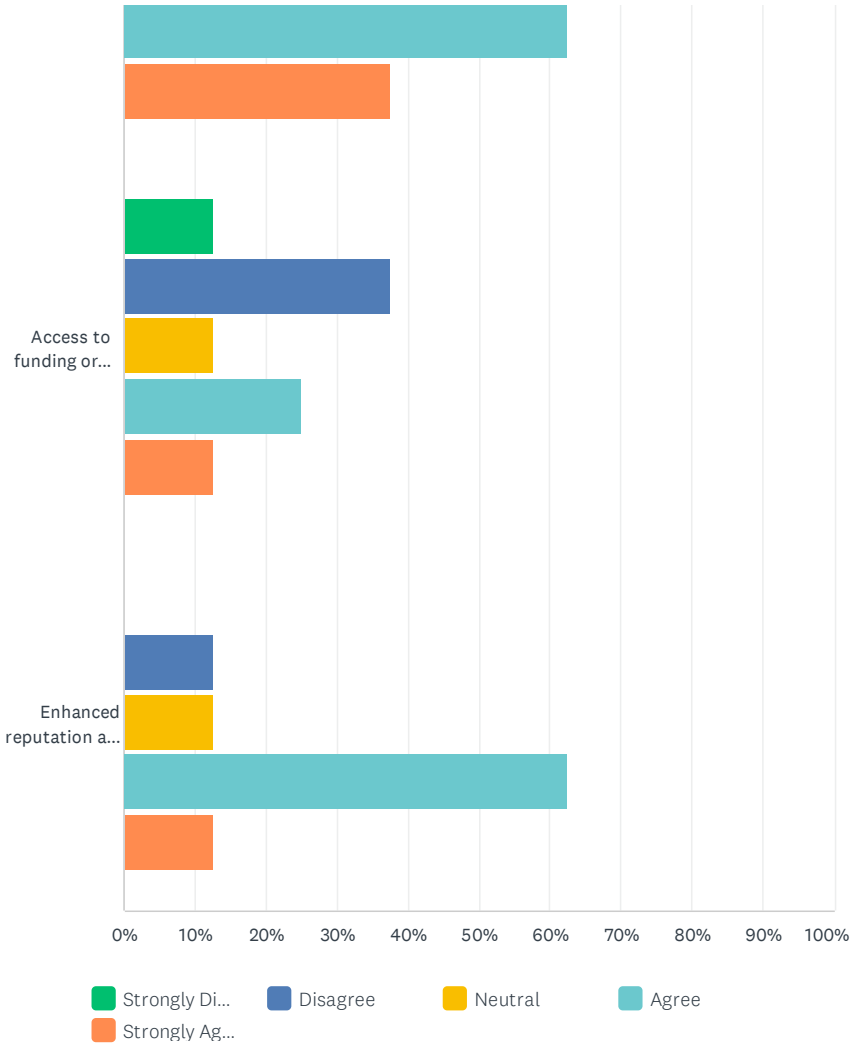
	UNSURE/NO OPINION	NOT VALUABLE OR RELEVANT	SOMEWHAT VALUABLE, BUT WITH LIMITED POTENTIAL	HIGHLY VALUABLE AND INNOVATIVE	TOTAL	WEIGHTED AVERAGE
☆	0.00% 0	50.00% 4	50.00% 4	0.00% 0	8	3.50

Q24 Please rate the aspects that would motivate you to collaborate with VET schools or centers?

Answered: 8 Skipped: 8



Applied Research in Vocational education & training - SME perspective



	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE	TOTAL	WEIGHTED AVERAGE
Access to specialized knowledge and expertise	0.00% 0	0.00% 0	12.50% 1	62.50% 5	25.00% 2	8	4.13
Access to equipment	12.50% 1	37.50% 3	25.00% 2	12.50% 1	12.50% 1	8	2.75
Potential for innovative solutions to business challenges	0.00% 0	0.00% 0	25.00% 2	50.00% 4	25.00% 2	8	4.00
Opportunities for knowledge exchange and networking	0.00% 0	0.00% 0	0.00% 0	62.50% 5	37.50% 3	8	4.38
Access to funding or grants for collaborative projects	12.50% 1	37.50% 3	12.50% 1	25.00% 2	12.50% 1	8	2.88
Enhanced reputation and visibility in the industry	0.00% 0	12.50% 1	12.50% 1	62.50% 5	12.50% 1	8	3.75

#	OTHER (PLEASE SPECIFY)	DATE
1	Rekrutierung von Personal	9/25/2023 6:04 PM

APPENDIX 2 – TKGUNE SURVEY FOR SMES

INTRODUCTION

This survey is part of a research project of the Vice-Ministry of Vocational Training and Orkestra-Basque Institute of Competitiveness whose main objective is to analyse the impact and value of the TKgune programme.

After conducting various interviews in some TKgune centres, on this occasion we went to all the teaching staff who have participated in the programme since its beginnings in order to find out their views on the benefits generated by the programme for companies, centres, the teaching staff themselves and the students. It also aims to identify areas where there is room for improvement.

The survey is completely anonymous. We would therefore appreciate it if you could be honest with your answers, it will take you no more than 8 minutes. If you have any questions about the research you can send us an email.

Presentation

1. Age: (range) 20-30/31-40/41-50/51 or older
2. Approximate number of completed projects you have participated in (ranges) 0-5/6-10/11-15/16-20/20 or more.
3. Historical territory where your centre is located:
   - Álava/Araba
   - Gipuzkoa
   - Bizkaia
4. Do you have work experience in the company (1. Yes/ 2.No)?
5. Are you a programme coordinator or teacher?

TEACHER ITINERARY

Benefits for teachers

6. To what extent has your participation in TKgune contributed to your work as a teacher? (From 1 to 4, being 1 Not at all and 4 A lot).

7. Rate from 1 to 4 (1 Not at all and 4 Very much), the following benefits associated with the Tkgune programme:

- It allows me to update my knowledge
- The knowledge I acquire responds to the reality of the local business environment.
- I acquire experiential knowledge that can be transferred to the classroom through projects.
- Transversal competences: teamwork, availability, professionalism, implication...
- Others (open answer) .

8. What is your overall level of satisfaction with the programme (from 1 to 4, 1 being not at all and 4 being very satisfied)?

Impact on enterprises

9. To what extent do you consider that the development of TKgune projects has favoured the modernisation of your VET centre? (From 1 to 4, being 1 Not at all and 4 A lot)

10. To what extent do you think that the following aspects are essential for the participation of companies in the Programme? (From 1 to 4, being 1 Not at all and 4 Very much)

- Relationship of trust and closeness
- Support with administrative procedures
- Partial financing of the project
- Technical expertise offered by the centre
- Adaptability and development of tailor-made solutions
- Speed of the solutions offered by the centre
- Physical proximity of the centre
- Knowledge of the teaching staff of the companies in the surrounding area
- Previous participation of the company in Dual VET/FCT

11. To what extent do you know if the TKgune projects have an impact on the following aspects of the participating companies? (From 1 to 4, 1 being no knowledge and 4 being a lot of knowledge)

- Increase in turnover

- Generation of exports
- Improving competitiveness
- Attracting and retaining talent

12. In general, what do you consider to be the level of satisfaction of the companies with the TKgune projects in which you have participated? (From 1 to 4, being 1 Not at all and 4 Very much)

13. To what extent have each of the following aspects contributed to your participation in TKgune having an impact on the students? (1 to 4, where 1 None and 4 Very much)

- Improved and more appropriate explanations from teachers
- Improvement and better adaptation of the syllabus.
- Generation of new challenges in the classroom
- Generation of new pedagogical strategies
- Increased self-motivation as a teacher
- Increased motivation and interest of students as teaching is more connected to reality.
- Other. Which ones?

14. To what extent have your students acquired the following competences and knowledge as a result of your participation in the TKgune programme? (From 1 to 4, where 1 Not at all and 4 Very much)

- Technical competences: knowledge adjusted to the reality of the environment.
- Stimulation of students' innovative capacity: practical solutions to business challenges.
- Transversal competences: teamwork, problem solving, critical analysis, availability, professionalism, involvement...
- Other (open answer)

15. To what extent can the following problems arise when dealing with companies that take part in TKgune projects? (From 1 to 4, where 1 Not at all and 4 Very much)

- Organisational demands: The forecast of hours of work does not coincide with reality.
- Organisational requirements: Short work deadlines (project execution).
- Management requirements: Poor communication with the company.
- Technical requirements: Lack of necessary infrastructure/resources in the company.
- Shortage of technical means at the centre
- Technical requirements: Lack of technical knowledge in the centre.
- Demands for attracting companies and projects.

16. Indicate to what extent the following aspects related to participation in TKgune projects are important to you (from 1 to 4, where 1 is not at all and 4 is very important)

- Opportunity to help companies solve needs
- Getting out of the routine of teaching by working on real projects
- The learning obtained in the projects
- Having a close relationship with the companies
- The satisfaction of the companies with the results achieved
- Recognition from colleagues
- Enrichment of my teaching work
- The prestige of your centre with respect to other centres.

Transfer of knowledge/Communication

17. In general, to what extent do you consider that the knowledge gained in the Tkgune programme is transferred to the following people/entities? adequately, (From 1 to 4, where 1 Not at all and 4 Very much)

- To the student body
- To the rest of the teachers at the school
- To other schools
- To other companies and agents in the surrounding area

18. Select the factors that you consider to be the most important

- The internal organisation of the school
- The selection of participating teachers
- Financial compensation for participation
- The school's facilities and infrastructure
- The mechanisms for attracting companies and projects
- Tools for the transfer of the knowledge generated
- Increased awareness of the programme among companies.

-

COORDINATOR ITINERARY

Internal organization

6. To what extent are the following factors important for the successful operation and positive impact of the TKgune programme (from 1 to 4, where 1 is Not at all and 4 is Very much)

- Having a stable team of specialist teachers
- Managing the motivation of the Tkgune team
- Integrating the projects well into the school calendar
- Supporting schools with paperwork/administration
- Partially finance the projects
- In-company experience of participating teachers
- Other (Which ones)

7. Indicate to what extent the following factors have been a difficulty for the development of the Tkgune programme in your experience as a coordinator

- Teachers' workload, which makes it impossible to participate in new Tkgune projects.
- Competition with other types of projects (innovation, Ethazi...)
- Lack of teachers interested in participating, due to lack of incentives.
- Lack of understanding of the functioning and implications of the programme by the teaching staff.
- School equipment
- Need to attract projects from companies
- Technical requirements of the projects
- Difficulties in motivating the Tkgune team.

8. Have you experienced any other difficulties during your period as Tkgune coordinator? (1. Yes/ 2.No) Which ones?

9. Does the participation of companies in Tkgune projects often lead to the use of other services (PEF, Dual...) that they did not use before?

- Never
- 2. sometimes
- 3. often
- 4. always

10. To what extent can the following problems arise when dealing with companies participating in TKgune projects? (From 1 to 4, where 1 Not at all and 4 Very much)

- Organisational demands: The forecast of the number of hours of work that does not coincide with reality.
- Organisational demands: Short work deadlines (project execution).
- Management requirements: Poor communication with the company.
- Technical requirements: Lack of necessary infrastructure/resources in the company.
- Shortage of technical means at the centre
- Technical requirements: Lack of technical knowledge in the centre.
- Demands for attracting companies and projects.

11. Indicate to what extent the following aspects related to participation in TKgune projects are important to you (from 1 to 4, where 1 is not at all and 4 is very important)

- Opportunity to help companies to solve needs
- Getting out of the routine of teaching by working on real projects
- The learning obtained in the projects
- Having a close relationship with the companies
- Satisfaction of the companies with the results achieved
- Recognition from colleagues internally
- Enrichment of the participants' teaching work.
- The prestige of your centre with respect to other centres.

12. What benefits have you observed that participation in the Tkgune Programme has for the school? (From 1 to 4)

    - Teacher training
    - Training of pupils: employability, pupil satisfaction...
    - Recognition and positioning of the school in the region.
    - Improvement of the relationship with companies

13. Do you monitor the benefits for the school in any way?
    - Yes
    - No

Communication/Dissemination of the programme

14. Do you think that the knowledge of the programme is adequately transferred, please rate from 1 to 4?

- To students
- To the rest of the teachers at the school
- To other centres
- To companies and agents in the surrounding area

Assessment of the programme

15. How would you rate your experience as a Tkgune coordinator in your centre? (from 1, very negative to 4, very positive)

16. Select the factors that you consider would improve the impact of the TKgune programme (multiple answer)

- The internal organisation of the school
- The selection of participating teachers
- Financial compensation for participation
- The school's facilities and infrastructure
- The mechanisms for attracting companies and projects
- Tools for the transfer of the knowledge generated
- Increased awareness of the programme among companies.

Collaborative project survey

Company satisfaction level

First contact and visit

Completely satisfied / Not satisfied

1
2
3
4
5

Deadline for submission of the budget

Completely satisfied / Not satisfied

1
2
3
4
5

Development deadline

Completely satisfied / Not satisfied

1
2
3
4
5

Quality of the work developed

Completely satisfied / Not satisfied

1
2
3
4
5

Value for money

Completely satisfied / Not satisfied

1
2
3
4
5

Adapting to the needs of the company

Completely satisfied / Not satisfied

1
2
3
4
5

How would you classify the impact of the collaborative project on th e company?

Research + Development
Innovation
Improvement
Other

Communication between enterprise and centre

Completely satisfied / Not satisfied

1
2
3
4
5

The project as a whole	Completely satisfied
Do you think that this collaborative project has proved useful in fostering an innovative culture in your organisation?	Some unanswered questions
Can it help to promote innovative action in the future?	Yes/no

Areas to be improved

What aspects do you value as the main strengths of this plan?

In accordance with the provisions of the LOPD (ORGANIC LAW ON DATA PROTECTION 15/1999, of 13 December) and its implementing regulations, the user is informed that by completing the following form, the data provided will become part of a file belonging to the Department of Education of the Basque Government, to comply with the purpose of administrative management of collaborative projects provided through the Tkgune programme managed by Tknika. You may exercise your rights of access, rectification, cancellation and/or opposition by contacting the Vice-Ministry of Vocational Training of the Department of Education, Av. Donostia-San Sebastián, nº 1, 01010 VITORIA-GASTEIZ. For more information, you can contact Tknika by telephone (+34) 943082900 or email: info@tknika.eus

Gorde / Guardar

APPENDIX 3 – SURVEY ON APPLIED RESEARCH IN VOCATIONAL EDUCATION & TRAINING – VET PERSPECTIVE

The survey can also be viewed online.

VET perspective survey in Pdf version

Applied Research in Vocational education & training - VET perspective

Welcome

Hello and thank you for taking time to fill out this questionnaire!

In the frame of the Erasmus+ co-funded project **AIRinVET**, we are interested in understanding the (potential) applied research and innovation activities undertaken by VET institutions for companies. When referring to "VET institutions," we are encompassing all educational institutions that provide professional vocational education and training. It is important to note that the terminology and specific names of such institutions may vary across different countries and regions. These institutions could be known as technical institutes, trade schools, polytechnics, vocational schools, community colleges, or any other relevant local designation.

Regardless of the specific name, we are interested in gathering insights about the applied research and innovation activities undertaken by these institutions for companies, as well as understanding the barriers and enablers associated with these activities. By "applied research and innovation activities" we mean the practical and systematic approach to solve real-world problems and improve existing technologies or processes.

Your participation is highly valuable to us, as it will contribute to a better understanding of the current landscape and potential opportunities for collaboration.

Please take 8-10 minutes to respond to the following questions. For your convenience, the questionnaire is available in English, Dutch, Spanish and German. You can switch the language in the upper right corner.
Your responses will be kept strictly confidential and used for research purposes only.

Thank you for your contribution!

* 1. Please indicate where the VET institution you work for is based

2. Please indicate the region/state/province where your VET institution is based

* 3. Please indicate your position within the VET Institution (multiple answers possible)

- [ ] Manager/administrator
- [ ] Teacher/trainer
- [ ] Researcher
- [ ] Support Staff (e.g., administrative staff, technical support)
- [ ] Other (please specify)

* 4. What sector does your VET institution focus on? (multiple answers possible)

- [ ] A - Agriculture, forestry and fishing
- [ ] B - Mining and quarrying
- [ ] C - Manufacturing
- [ ] D - Electricity, gas, steam and air conditioning supply
- [ ] E - Water supply; sewerage, waste management and remediation activities
- [ ] F - Construction
- [ ] G - Wholesale and retail trade; repair of motor vehicles and motorcycles
- [ ] H - Transportation and storage
- [ ] I - Accommodation and food service activities
- [ ] J - Information and communication
- [ ] K - Financial and insurance activities
- [ ] L - Real estate activities
- [ ] M - Professional, scientific and technical activities
- [ ] N - Administrative and support service activities
- [ ] O - Public administration and defence; compulsory social security
- [ ] P - Education
- [ ] Q - Human health and social work activities
- [ ] R - Arts, entertainment and recreation
- [ ] S - Other service activities
- [ ] T - Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use
- [ ] U - Activities of extraterritorial organisations and bodies
- [ ] Other (please specify)

* 5. What levels of education do you offer according to the European Qualification Framework (EQF)? (multiple answers possible)

You can find the description of EQF in your national language here:
https://europa.eu/europass/en/description-eight-eqf-levels

- [ ] EQF 1
- [ ] EQF 2
- [ ] EQF 3
- [ ] EQF 4
- [ ] EQF 5
- [ ] EQF 6
- [ ] EQF 7
- [ ] EQF 8

* 6. How many students do you have at your VET institution?

- ◯ Fewer than 500 students
- ◯ 500 - 2000 students
- ◯ 2000 - 5000 students
- ◯ more than 5000 students

* 7. Please indicate the approximate number of staff members employed at your VET institution, including teaching faculty and support staff:

- ◯ Less than 50
- ◯ 50-100
- ◯ 101-500
- ◯ 501-1000
- ◯ More than 1000

* 8. Since when is your VET institution operating?

- ◯ less than 5 years
- ◯ more than 5 years

Applied Research in Vocational education & training - VET perspective

Functions and services

* 9. Please indicate the types of training and services your VET institution offers. (multiple answers possible)

- ☐ Initial VET programs for individuals entering the workforce for the first time
- ☐ Apprenticeship programs combine on-the-job training with classroom instruction
- ☐ Continuing VET programs for individuals seeking to upgrade their skills or pursue career advancement
- ☐ Higher VET (HVET) programs providing specialized vocational training at a higher educational level
- ☐ Short-term professional development courses for upskilling or reskilling purposes
- ☐ Career guidance
- ☐ Train the trainers
- ☐ Other (please specify)

* 10. Please indicate the types of services your VET institution provides to companies. (multiple answers possible)

- [ ] Applied research and development projects
- [ ] Training and upskilling programs for company employees
- [ ] Work-integrated learning opportunities (e.g., internships, apprenticeships)
- [ ] Consulting and advisory services
- [ ] Customized workforce development programs tailored to company needs
- [ ] Access to specialized facilities, equipment, or technology
- [ ] None of the above
- [ ] Other (please specify)

* 11. Please indicate how many hours per week you spend on average on applied research and innovation activities

0 hours 20 hours 40 hours

Applied Research in Vocational education & training - VET perspective

Applied Research and Innovation experience

* 12. What kind of applied research and innnovation activities was/is your VET institutions involved in? (multiple answers possible)

- [ ] Product development
- [ ] Process optimization
- [ ] Market analysis
- [ ] Technology advancement
- [ ] Social program evaluation
- [ ] Development of education materials
- [ ] Other (please specify)

* 13. What kind of applied research methods do you offer? (multiple answers possible)

- [ ] Test beds
- [ ] Proofs of concepts
- [ ] Testing, simulations
- [ ] Data gathering
- [ ] Desk research
- [ ] Data analysis
- [ ] Sampling
- [ ] Prototyping
- [ ] Feasibility study
- [ ] Other (please specify)

* 14. Could you provide examples of the outputs or tangible solutions that were developed as a result of applied research activities with companies? (multiple answers possible)

- [ ] New product prototypes
- [ ] Streamlined production processes
- [ ] Proof of concept
- [ ] Market reports and insights
- [ ] Improved software algorithms
- [ ] Program impact assessments
- [ ] Other (please specify)

* 15. How many applied research case studies does your VET institution undertake per year?

- ◯ fewer than 5
- ◯ 5-10
- ◯ 11-50
- ◯ more than 50

* 16. How would you rate the overall experience of engaging in applied research activities within your VET institution?

Highly challenging	Challenging	Neutral	Positive	Highly positive
★	★	★	★	★

* 17. Which stakeholders were involved in the applied research and innovation activities? (multiple answers possible)

- [ ] Faculty staff/teachers
- [ ] Students
- [ ] Technicians
- [ ] External industry experts/consultants
- [ ] Government agencies
- [ ] Academic researchers
- [ ] End-users or customers
- [ ] Other (please specify)

* 18. What kind of funding does your VET institution use for the applied research activities? (multiple answers possible)

- [ ] Government grants
- [ ] Private investors
- [ ] Research partnerships
- [ ] Funding from companies
- [ ] Other (please specify)

* 19. How would you rate the key elements that can contribute to a successful applied research collaboration between VET institutions and companies?

Please rate the following key elements on a scale from 1 to 5

	1 - Strongly Disagree	2 - Disagree	3 - Neutral	4 - Agree	5 - Strongly Agree
Strong industry partnerships and collaborations	○	○	○	○	○
Sufficient funding and resources	○	○	○	○	○
Supportive institutional leadership	○	○	○	○	○
Qualified staff with research expertise	○	○	○	○	○
Access to advanced technology or equipment	○	○	○	○	○
Well-defined processes for project management and implementation	○	○	○	○	○
Proactive outreach and promotion of collaboration opportunities to companies	○	○	○	○	○
Clear communication channels	○	○	○	○	○
Complementary expertise and resources	○	○	○	○	○
Effective project management	○	○	○	○	○
Timely and reliable deliverables	○	○	○	○	○
Strong commitment from both parties	○	○	○	○	○

Other (please specify)

Applied Research in Vocational education & training - VET perspective

Future Considerations

* 20. Please rate the main reasons why your VET institution has not collaborated with a company on applied research projects.

Please rate the following barriers on a scale from 1 to 5

	1 - No Barrier	2 - Minor Barrier	3 - Moderate Barrier	4 - Significant Barrier	5 - Major Barrier
Lack of funding and resources	○	○	○	○	○
Lack of staff	○	○	○	○	○
Limited industry partnerships	○	○	○	○	○
Insufficient faculty expertise in research and innovation	○	○	○	○	○
Time constraints and heavy workload	○	○	○	○	○
Regulatory or compliance issues	○	○	○	○	○
Limited access to advanced technology or equipment	○	○	○	○	○
Lack of awareness among companies about collaboration opportunities	○	○	○	○	○
Unclear benefits or relevance	○	○	○	○	○
Cultural differences between education institutions and industry	○	○	○	○	○
Administrative and contractual complexities	○	○	○	○	○

Other (please specify)

* 21. Would you consider collaborating with a company on future applied research projects?

Not at all	Unlikely	Undecided	Probably	Definitely
☆	☆	☆	☆	☆

22. Please indicate what would motivate you to collaborate with companies on applied research projects?

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Access to specialized knowledge and expertise	○	○	○	○	○
Access to equipment	○	○	○	○	○
Potential for innovative solutions to business challenges	○	○	○	○	○
Opportunities for knowledge exchange and networking	○	○	○	○	○
Access to funding or grants for collaborative projects	○	○	○	○	○
Enhanced reputation and visibility in the industry	○	○	○	○	○

Other (please specify)

* 23. Please rate the key conditions that need to be met in order to undertake applied research projects with companies.

Please rate the following key conditions on a scale from 1 to 5

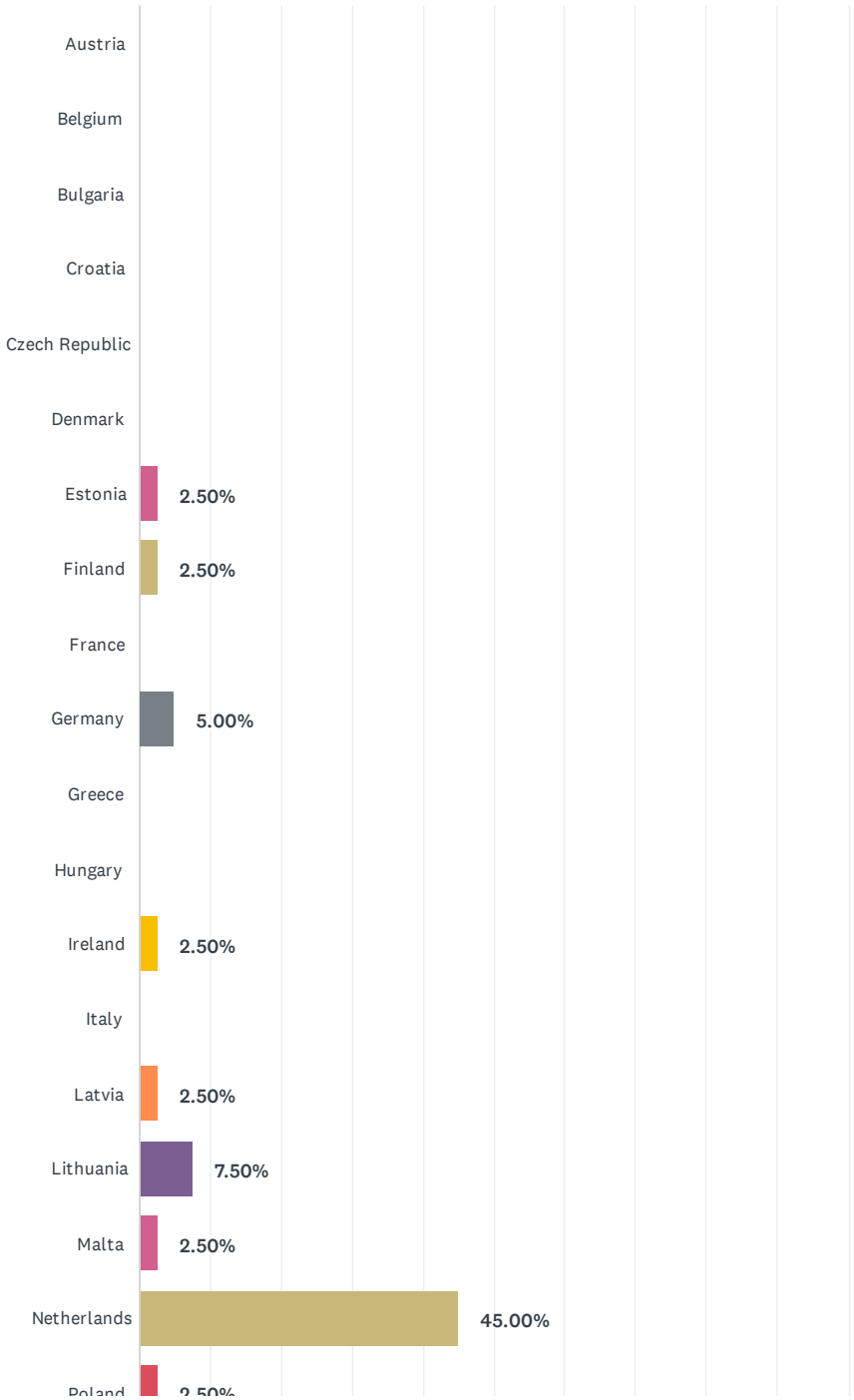
	Not Important	Somewhat Important	Neutral	Important	Very Important
Strengthened industry partnerships and collaborations	○	○	○	○	○
Increased funding and resources allocation	○	○	○	○	○
Supportive institutional leadership	○	○	○	○	○
Enhanced faculty training and expertise development in research and innovation	○	○	○	○	○
Improved access to advanced technology or equipment	○	○	○	○	○
Well-defined processes for project management and implementation	○	○	○	○	○
Complementary expertise and resources	○	○	○	○	○
Strong commitment from both parties	○	○	○	○	○
Streamlined processes and reduced administrative burden	○	○	○	○	○
Enhanced marketing and awareness efforts to promote collaboration opportunities	○	○	○	○	○

Other (please specify)

Applied Research in Vocational education & training - VET perspective

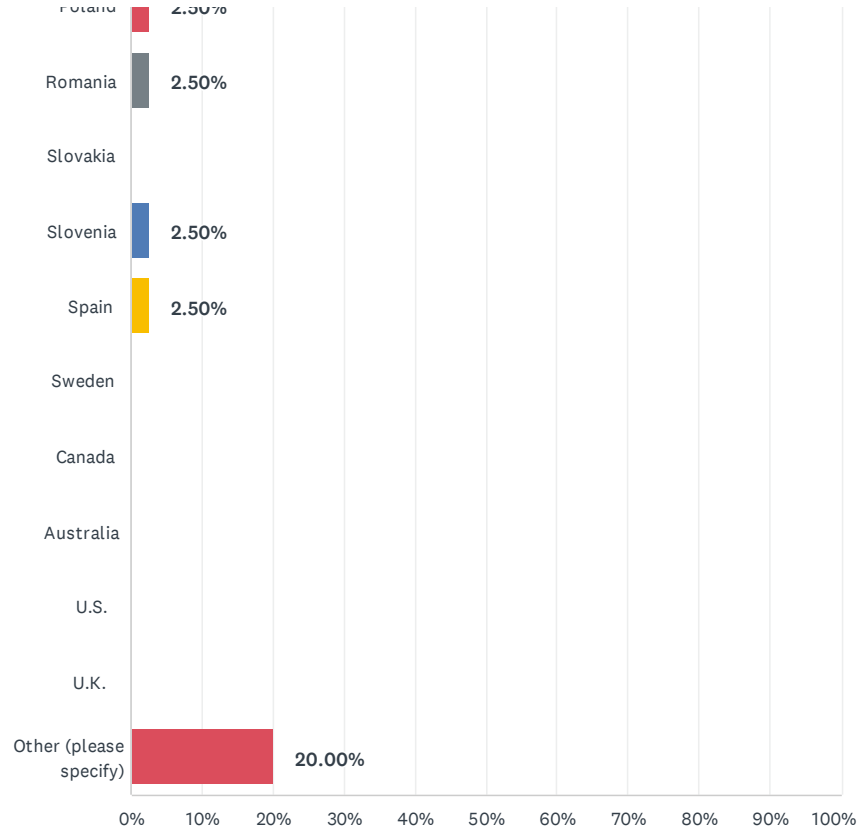
Q1 Please indicate where the VET institution you work for is based

Answered: 40 Skipped: 0



1 / 38

Applied Research in Vocational education & training - VET perspective



ANSWER CHOICES	RESPONSES	
Austria	0.00%	0
Belgium	0.00%	0
Bulgaria	0.00%	0
Croatia	0.00%	0
Czech Republic	0.00%	0
Denmark	0.00%	0
Estonia	2.50%	1
Finland	2.50%	1
France	0.00%	0
Germany	5.00%	2
Greece	0.00%	0
Hungary	0.00%	0
Ireland	2.50%	1
Italy	0.00%	0
Latvia	2.50%	1
Lithuania	7.50%	3
Malta	2.50%	1
Netherlands	45.00%	18
Poland	2.50%	1
Romania	2.50%	1
Slovakia	0.00%	0
Slovenia	2.50%	1
Spain	2.50%	1
Sweden	0.00%	0
Canada	0.00%	0
Australia	0.00%	0
U.S.	0.00%	0
U.K.	0.00%	0
Other (please specify)	20.00%	8
TOTAL		40

#	OTHER (PLEASE SPECIFY)	DATE
1	PERU	10/20/2023 4:22 PM

2	Azerbaijan	10/12/2023 9:25 AM
3	Estland	10/5/2023 11:15 AM
4	Moldova	9/30/2023 10:52 PM
5	Bosnia and Herzegovina	9/29/2023 1:43 PM
6	Portugal	9/29/2023 10:34 AM
7	serbia	9/28/2023 10:07 PM
8	Norway	9/25/2023 5:09 PM

Q2 Please indicate the region/state/province where your VET institution is based

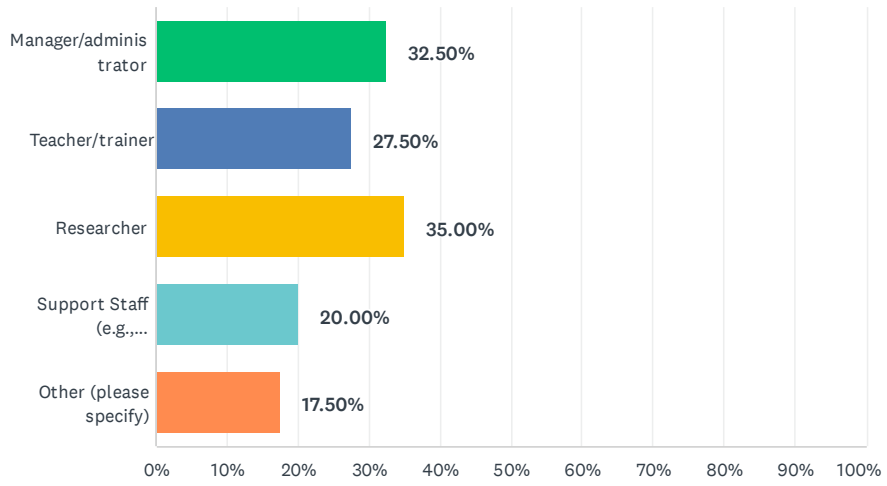
Answered: 36 Skipped: 4

#	RESPONSES	DATE
1	Firsland en Noordelijk Flevoland	12/4/2023 2:16 PM
2	Overijssel	11/30/2023 9:11 AM
3	zuid holland	11/9/2023 3:45 PM
4	Overijssel	11/9/2023 1:17 PM
5	Leiden, Zuid-Holland	11/8/2023 1:21 PM
6	Groningen	11/7/2023 3:12 PM
7	Zuid-Holland	11/7/2023 11:27 AM
8	Overijssel	11/6/2023 4:06 PM
9	Provincie Utrecht	11/6/2023 2:51 PM
10	Noord-Brabant	11/6/2023 9:40 AM
11	Utrecht	11/3/2023 4:12 PM
12	Limburg	11/3/2023 1:59 PM
13	Gelderland, Overijssel, Friesland, Groningen, Flevoland	11/3/2023 9:33 AM
14	Overijssel	11/3/2023 9:22 AM
15	Zuid-Holland	11/3/2023 9:16 AM
16	North Brabant	11/3/2023 8:20 AM
17	Noord-Holland	11/2/2023 4:24 PM
18	Lima	10/20/2023 4:22 PM
19	Gipuzkoa	10/20/2023 3:59 PM
20	Tartu	10/12/2023 1:15 PM
21	Azerbaijan, Sumgait city, Kimyacilar 1, Vocational Educational Center under Economical Zones Development Agency	10/12/2023 9:25 AM
22	Pnevezys county	10/10/2023 8:43 AM
23	Landkreis Vöru	10/5/2023 11:15 AM
24	Visaginas	10/5/2023 9:36 AM

25	Chisinau	9/30/2023 10:52 PM
26	Berlin	9/30/2023 2:00 PM
27	Education and Training Boards Ireland is the national representative body for the 16 ETBs in Ireland	9/29/2023 3:55 PM
28	Middle Bosnia Canton, Kiseljak	9/29/2023 1:43 PM
29	Portalegre	9/29/2023 10:34 AM
30	Warsaw	9/29/2023 9:21 AM
31	Nisava district	9/28/2023 10:07 PM
32	SUD MUNTENIA	9/28/2023 10:07 AM
33	Overijssel	9/28/2023 8:29 AM
34	Luqa Malta	9/27/2023 5:41 PM
35	County Innlandet	9/25/2023 5:09 PM
36	Panevezys	9/25/2023 12:19 PM

Q3 Please indicate your position within the VET Institution (multiple answers possible)

Answered: 40 Skipped: 0

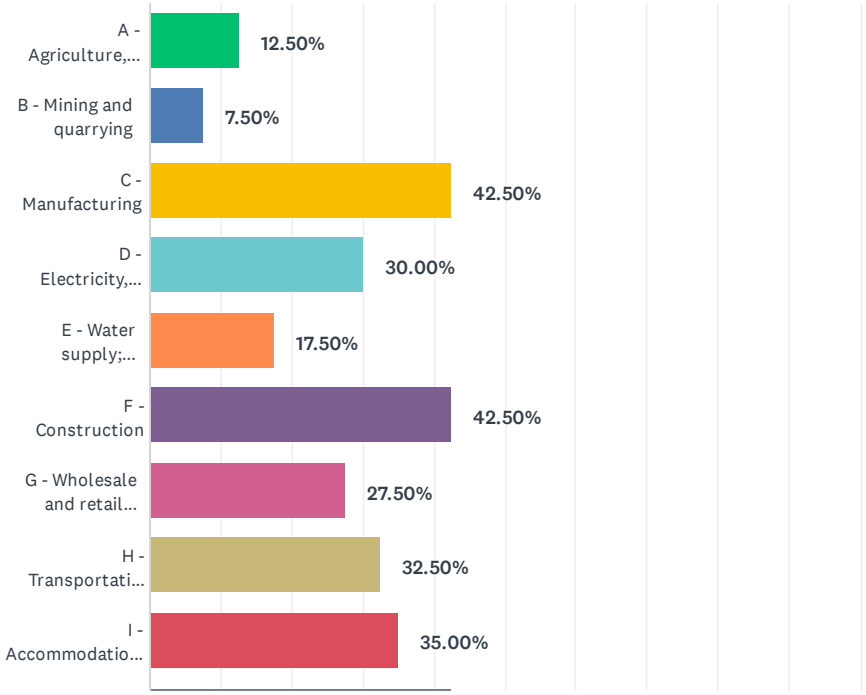


ANSWER CHOICES	RESPONSES	
Manager/administrator	32.50%	13
Teacher/trainer	27.50%	11
Researcher	35.00%	14
Support Staff (e.g., administrative staff, technical support)	20.00%	8
Other (please specify)	17.50%	7
Total Respondents: 40		

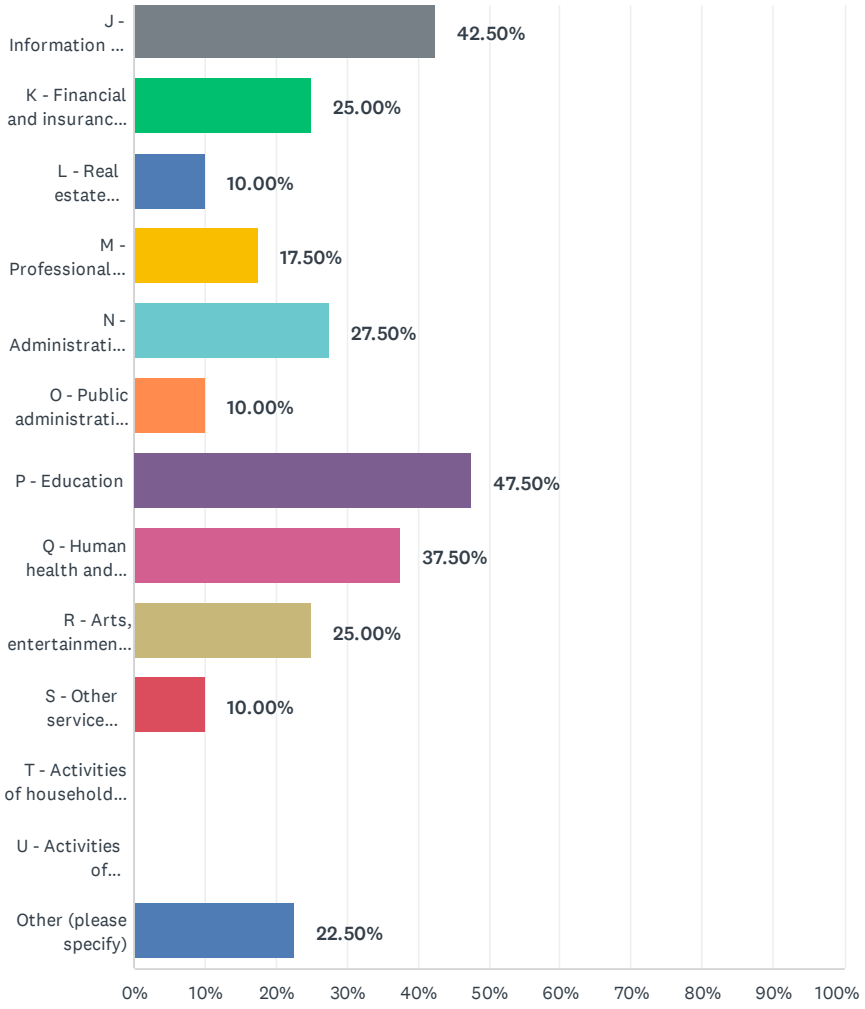
#	OTHER (PLEASE SPECIFY)	DATE
1	Practor	11/6/2023 2:51 PM
2	Practor	11/3/2023 4:12 PM
3	PRACTOR	11/3/2023 9:33 AM
4	Expert docent (practor) / projectleider	11/3/2023 9:22 AM
5	practor	11/3/2023 9:16 AM
6	Practor	11/3/2023 8:20 AM
7	Quality Assurance Head	9/27/2023 5:41 PM

Q4 What sector does your VET institution focus on? (multiple answers possible)

Answered: 40 Skipped: 0



Applied Research in Vocational education & training - VET perspective



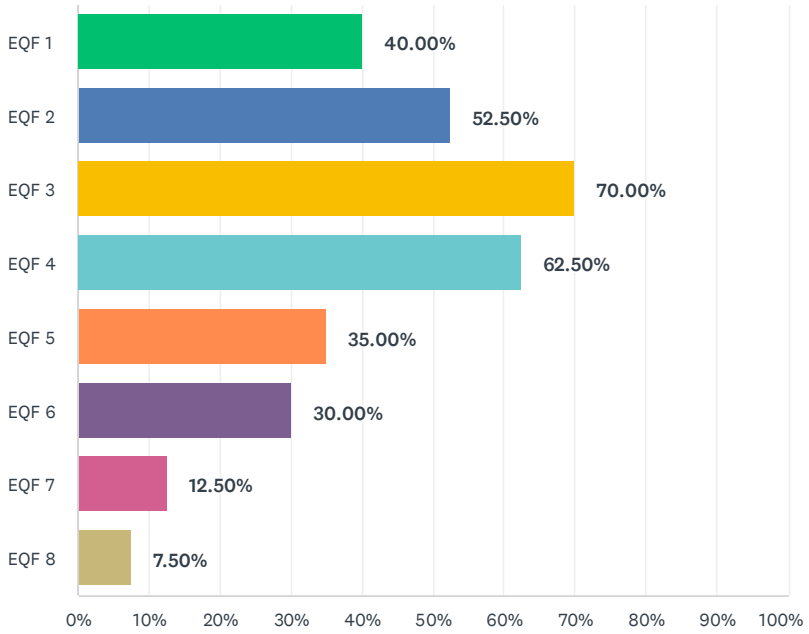
ANSWER CHOICES	RESPONSES	
A - Agriculture, forestry and fishing	12.50%	5
B - Mining and quarrying	7.50%	3
C - Manufacturing	42.50%	17
D - Electricity, gas, steam and air conditioning supply	30.00%	12
E - Water supply; sewerage, waste management and remediation activities	17.50%	7
F - Construction	42.50%	17
G - Wholesale and retail trade; repair of motor vehicles and motorcycles	27.50%	11
H - Transportation and storage	32.50%	13
I - Accommodation and food service activities	35.00%	14
J - Information and communication	42.50%	17
K - Financial and insurance activities	25.00%	10
L - Real estate activities	10.00%	4
M - Professional, scientific and technical activities	17.50%	7
N - Administrative and support service activities	27.50%	11
O - Public administration and defence; compulsory social security	10.00%	4
P - Education	47.50%	19
Q - Human health and social work activities	37.50%	15
R - Arts, entertainment and recreation	25.00%	10
S - Other service activities	10.00%	4
T - Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use	0.00%	0
U - Activities of extraterritorial organisations and bodies	0.00%	0
Other (please specify)	22.50%	9
Total Respondents: 40		

#	OTHER (PLEASE SPECIFY)	DATE
1	all sectors	11/6/2023 4:06 PM
2	Groene ruimte/openbare ruimte/fysiek groen	11/6/2023 2:51 PM
3	Ik vul het nu in vanuit	11/3/2023 9:22 AM
4	1. Master of Automation, 2. master of electronics, 3. lathe and treser machine operator, 4. operator of software-controlled machine tools	10/12/2023 9:25 AM
5	Chemistry, Biology, Pharmacy, Physics	10/7/2023 6:02 AM
6	Holzbearbeitung	10/5/2023 11:15 AM
7	As a representative body we represent organisations the deliver VET in a wide variety of areas.	9/29/2023 3:55 PM

8	Energy	9/29/2023 1:43 PM
9	Tourism and Hospitality	9/27/2023 5:41 PM

Q5 What levels of education do you offer according to the European Qualification Framework (EQF)? (multiple answers possible)You can find the description of EQF in your national language here: https://europa.eu/europass/en/description-eight-eqf-levels

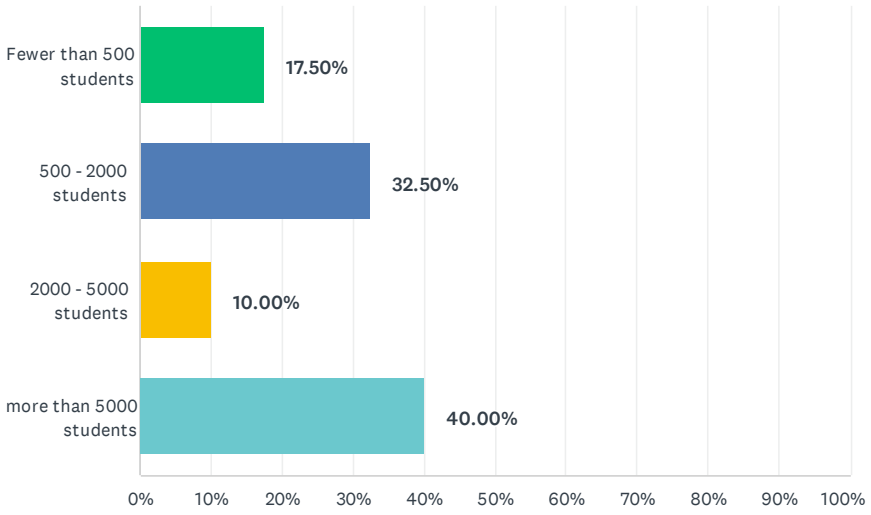
Answered: 40 Skipped: 0



ANSWER CHOICES	RESPONSES	
EQF 1	40.00%	16
EQF 2	52.50%	21
EQF 3	70.00%	28
EQF 4	62.50%	25
EQF 5	35.00%	14
EQF 6	30.00%	12
EQF 7	12.50%	5
EQF 8	7.50%	3
Total Respondents: 40		

Q6 How many students do you have at your VET institution?

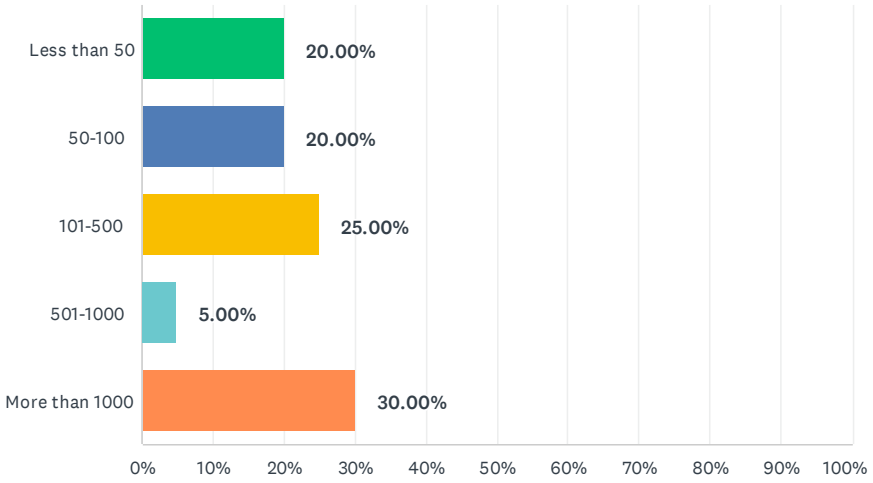
Answered: 40 Skipped: 0



ANSWER CHOICES	RESPONSES	
Fewer than 500 students	17.50%	7
500 - 2000 students	32.50%	13
2000 - 5000 students	10.00%	4
more than 5000 students	40.00%	16
TOTAL		40

Q7 Please indicate the approximate number of staff members employed at your VET institution, including teaching faculty and support staff:

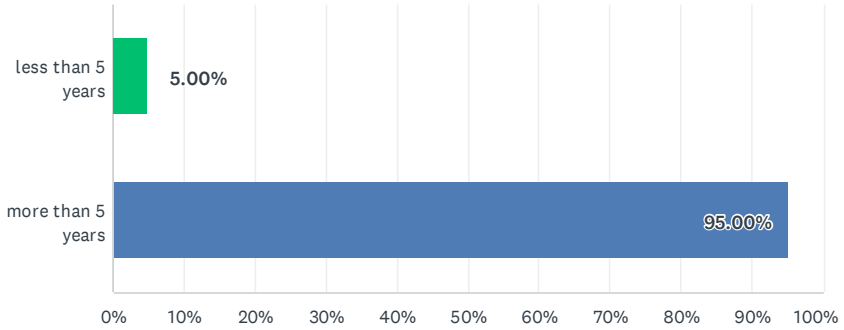
Answered: 40 Skipped: 0



ANSWER CHOICES	RESPONSES	
Less than 50	20.00%	8
50-100	20.00%	8
101-500	25.00%	10
501-1000	5.00%	2
More than 1000	30.00%	12
TOTAL		40

Q8 Since when is your VET institution operating?

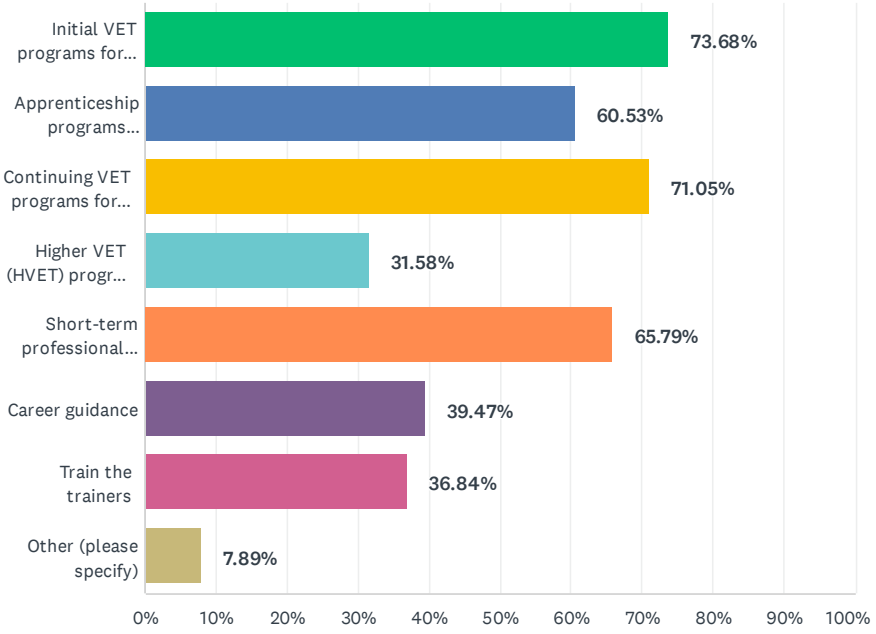
Answered: 40 Skipped: 0



ANSWER CHOICES	RESPONSES	
less than 5 years	5.00%	2
more than 5 years	95.00%	38
TOTAL		40

Q9 Please indicate the types of training and services your VET institution offers. (multiple answers possible)

Answered: 38 Skipped: 2

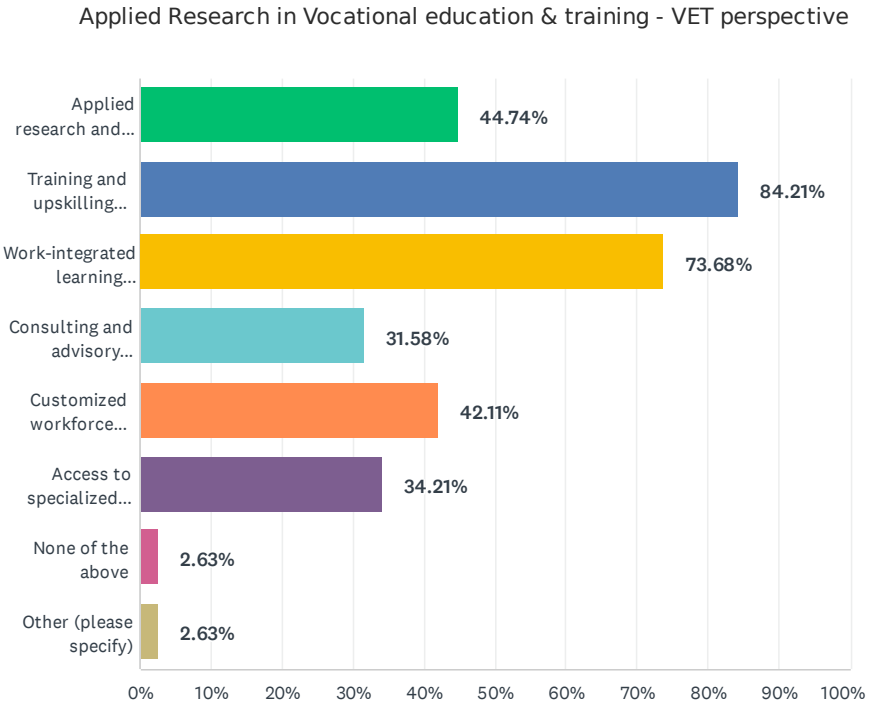


ANSWER CHOICES	RESPONSES	
Initial VET programs for individuals entering the workforce for the first time	73.68%	28
Apprenticeship programs combine on-the-job training with classroom instruction	60.53%	23
Continuing VET programs for individuals seeking to upgrade their skills or pursue career advancement	71.05%	27
Higher VET (HVET) programs providing specialized vocational training at a higher educational level	31.58%	12
Short-term professional development courses for upskilling or reskilling purposes	65.79%	25
Career guidance	39.47%	15
Train the trainers	36.84%	14
Other (please specify)	7.89%	3
Total Respondents: 38		

#	OTHER (PLEASE SPECIFY)	DATE
1	Inburgering, taalschakeltraject, remediering	11/30/2023 9:14 AM
2	Lifelong Learning Programs	9/29/2023 1:45 PM
3	our institution conducts VET exams/assessment for the whole country - it does not provide training	9/29/2023 9:23 AM

Q10 Please indicate the types of services your VET institution provides to companies. (multiple answers possible)

Answered: 38 Skipped: 2



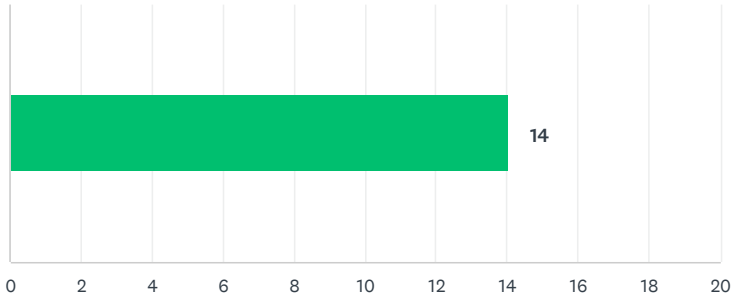
ANSWER CHOICES	RESPONSES	
Applied research and development projects	44.74%	17
Training and upskilling programs for company employees	84.21%	32
Work-integrated learning opportunities (e.g., internships, apprenticeships)	73.68%	28
Consulting and advisory services	31.58%	12
Customized workforce development programs tailored to company needs	42.11%	16
Access to specialized facilities, equipment, or technology	34.21%	13
None of the above	2.63%	1
Other (please specify)	2.63%	1
Total Respondents: 38		

#	OTHER (PLEASE SPECIFY)	DATE
1	As indicated above institution conducts assessment	9/29/2023 9:23 AM

Q11 Please indicate how many hours per week you spend on average on applied research and innovation activities

Answered: 38 Skipped: 2

Applied Research in Vocational education & training - VET perspective



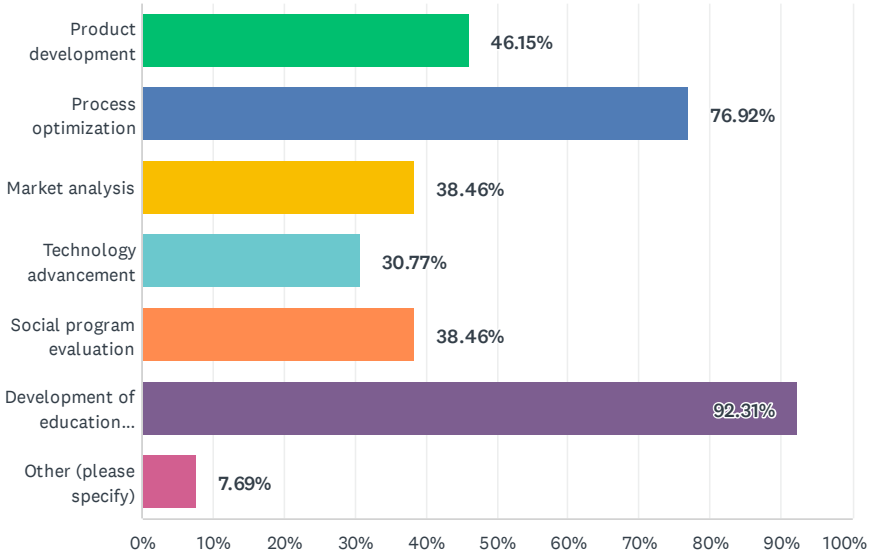
ANSWER CHOICES	AVERAGE NUMBER	TOTAL NUMBER	RESPONSES
	14	533	38
Total Respondents: 38			

#		DATE
1	32	12/4/2023 2:17 PM
2	9	11/30/2023 9:14 AM
3	10	11/9/2023 3:46 PM
4	4	11/9/2023 1:18 PM
5	16	11/8/2023 1:22 PM
6	20	11/7/2023 3:13 PM
7	24	11/7/2023 11:28 AM
8	4	11/6/2023 4:07 PM
9	20	11/6/2023 2:52 PM
10	16	11/6/2023 9:41 AM
11	16	11/3/2023 4:14 PM
12	20	11/3/2023 2:00 PM
13	28	11/3/2023 9:35 AM
14	1	11/3/2023 9:17 AM
15	17	11/3/2023 8:20 AM
16	15	11/2/2023 4:25 PM
17	15	10/20/2023 4:30 PM
18	8	10/20/2023 4:01 PM
19	19	10/20/2023 1:23 PM
20	10	10/12/2023 1:17 PM
21	8	10/12/2023 9:29 AM
22	10	10/10/2023 1:06 PM
23	25	10/7/2023 6:03 AM
24	10	10/5/2023 11:16 AM

25	1	10/5/2023 9:41 AM
26	7	9/30/2023 10:53 PM
27	8	9/30/2023 2:02 PM
28	1	9/29/2023 3:56 PM
29	5	9/29/2023 1:45 PM
30	5	9/29/2023 9:23 AM
31	16	9/28/2023 10:08 PM
32	40	9/28/2023 10:10 AM
33	20	9/28/2023 8:32 AM
34	13	9/28/2023 6:47 AM
35	8	9/27/2023 5:42 PM
36	10	9/25/2023 10:29 PM
37	22	9/25/2023 5:13 PM
38	20	9/25/2023 12:20 PM

Q12 What kind of applied research and innnovation activities was/is your VET institutions involved in? (multiple answers possible)

Answered: 13 Skipped: 27



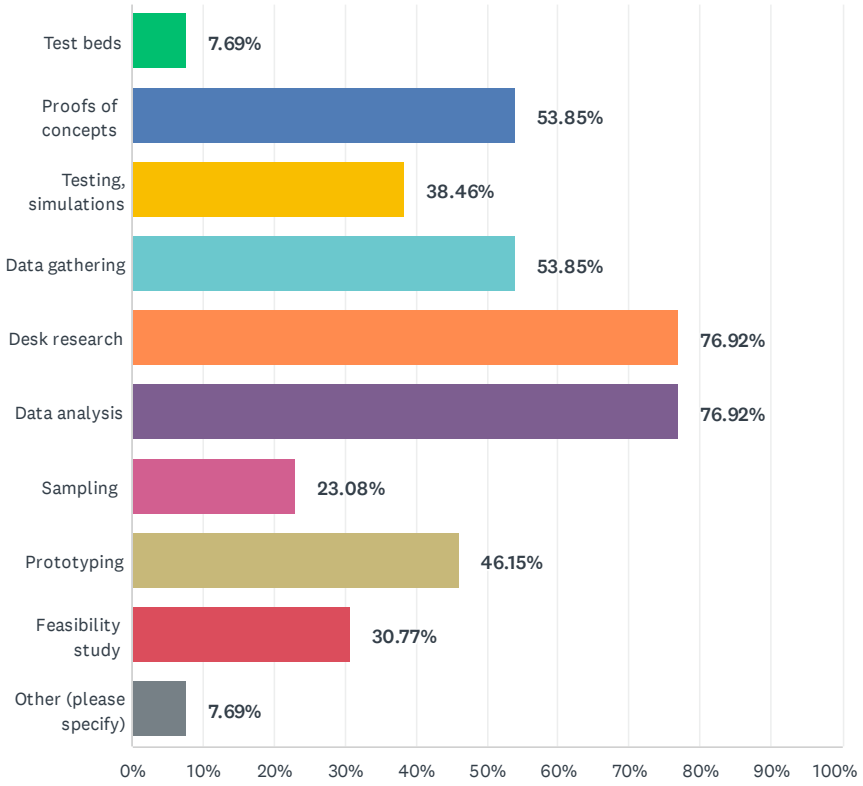
ANSWER CHOICES	RESPONSES	
Product development	46.15%	6
Process optimization	76.92%	10
Market analysis	38.46%	5
Technology advancement	30.77%	4
Social program evaluation	38.46%	5
Development of education materials	92.31%	12
Other (please specify)	7.69%	1
Total Respondents: 13		

#	OTHER (PLEASE SPECIFY)	DATE
1	professionalisation	11/6/2023 4:13 PM

Q13 What kind of applied research methods do you offer? (multiple answers possible)

Answered: 13 Skipped: 27

Applied Research in Vocational education & training - VET perspective

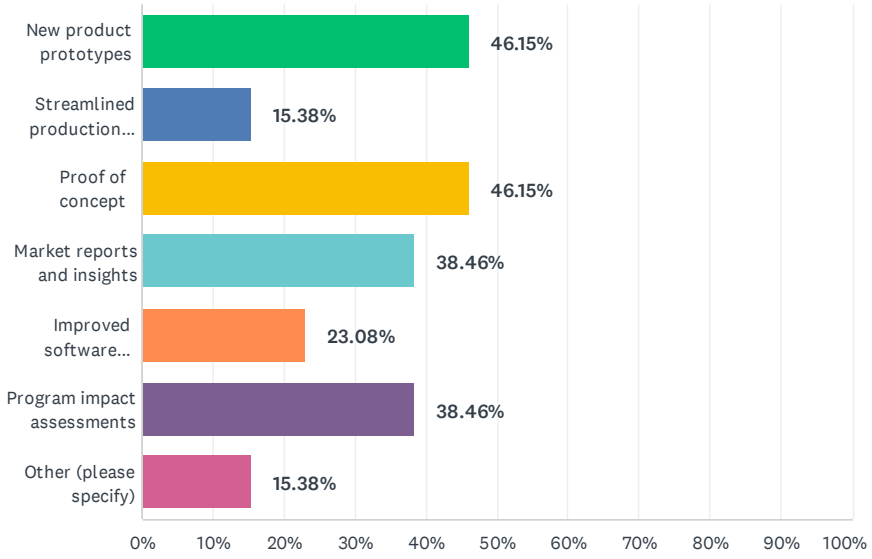


ANSWER CHOICES	RESPONSES	
Test beds	7.69%	1
Proofs of concepts	53.85%	7
Testing, simulations	38.46%	5
Data gathering	53.85%	7
Desk research	76.92%	10
Data analysis	76.92%	10
Sampling	23.08%	3
Prototyping	46.15%	6
Feasibility study	30.77%	4
Other (please specify)	7.69%	1
Total Respondents: 13		

#	OTHER (PLEASE SPECIFY)	DATE
1	Actiegericht praktijkonderzoek	11/3/2023 4:18 PM

Q14 Could you provide examples of the outputs or tangible solutions that were developed as a result of applied research activities with companies? (multiple answers possible)

Answered: 13 Skipped: 27

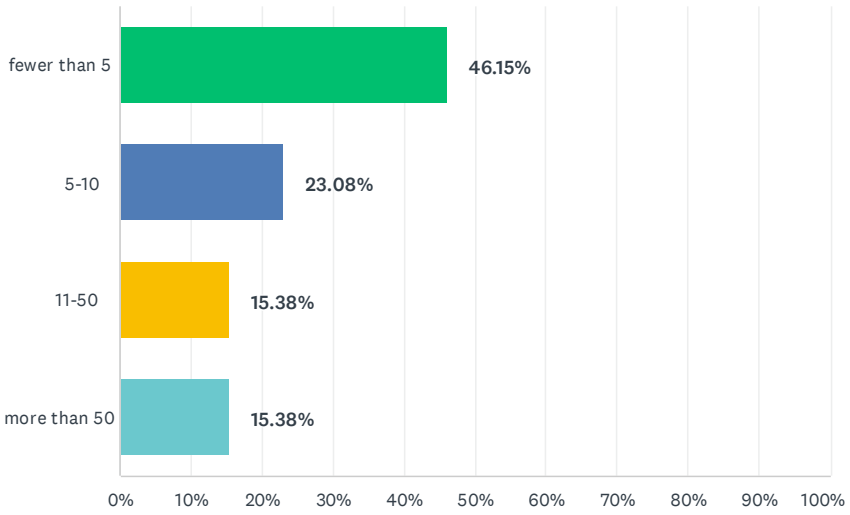


ANSWER CHOICES	RESPONSES	
New product prototypes	46.15%	6
Streamlined production processes	15.38%	2
Proof of concept	46.15%	6
Market reports and insights	38.46%	5
Improved software algorithms	23.08%	3
Program impact assessments	38.46%	5
Other (please specify)	15.38%	2
Total Respondents: 13		

#	OTHER (PLEASE SPECIFY)	DATE
1	Aangepaste onderwijsprogramma's aansluitend bij de werkvloer (zorg en kinderopvang)	11/3/2023 4:18 PM
2	Skills analysis and curricula	9/30/2023 2:06 PM

Q15 How many applied research case studies does your VET institution undertake per year?

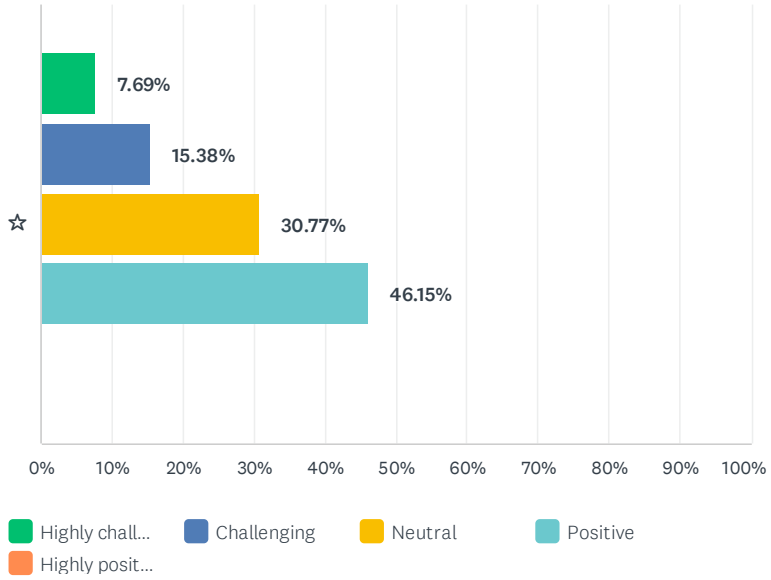
Answered: 13 Skipped: 27



ANSWER CHOICES	RESPONSES	
fewer than 5	46.15%	6
5-10	23.08%	3
11-50	15.38%	2
more than 50	15.38%	2
TOTAL		13

Q16 How would you rate the overall experience of engaging in applied research activities within your VET institution?

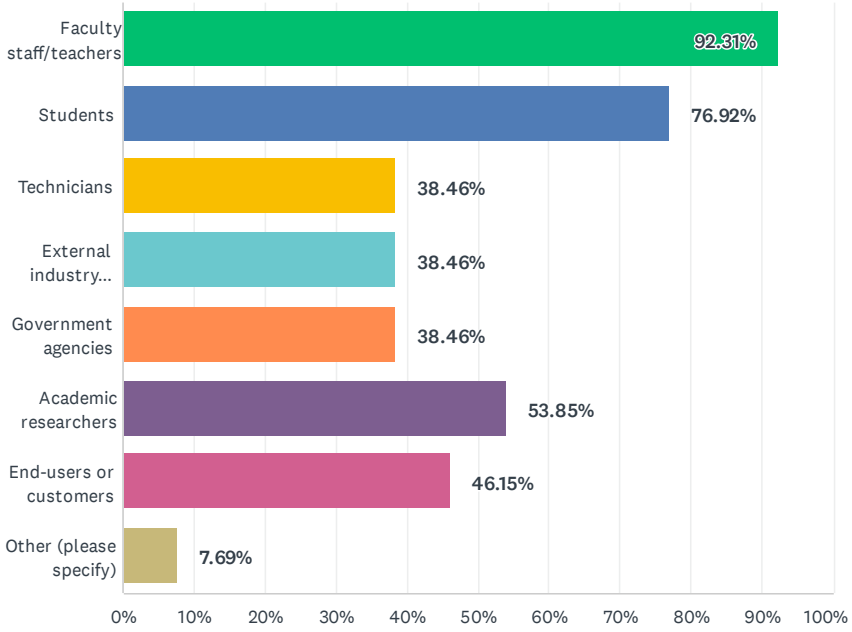
Answered: 13 Skipped: 27



	HIGHLY CHALLENGING	CHALLENGING	NEUTRAL	POSITIVE	HIGHLY POSITIVE	TOTAL	WEIGHTED AVERAGE
☆	7.69% 1	15.38% 2	30.77% 4	46.15% 6	0.00% 0	13	3.15

Q17 Which stakeholders were involved in the applied research and innovation activities? (multiple answers possible)

Answered: 13 Skipped: 27



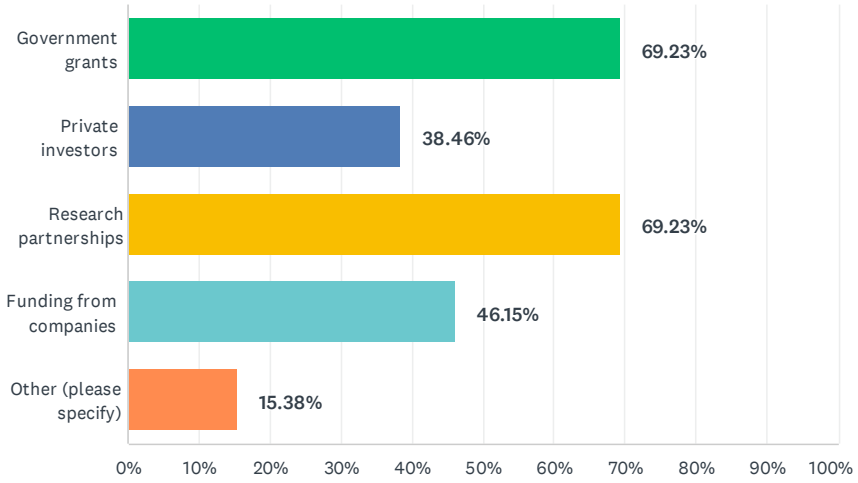
ANSWER CHOICES	RESPONSES	
Faculty staff/teachers	92.31%	12
Students	76.92%	10
Technicians	38.46%	5
External industry experts/consultants	38.46%	5
Government agencies	38.46%	5
Academic researchers	53.85%	7
End-users or customers	46.15%	6
Other (please specify)	7.69%	1
Total Respondents: 13		

#	OTHER (PLEASE SPECIFY)	DATE
1	Partners wisselen per project. We streven altijd naar de driehoek onderwijs (docenten, studenten), werkveld (bedrijven, organisaties, overheid, scholen, etc.) en onderzoek (lector, onderzoeker)	9/28/2023 8:36 AM

Q18 What kind of funding does your VET institution use for the applied research activities? (multiple answers possible)

Answered: 13 Skipped: 27

Applied Research in Vocational education & training - VET perspective

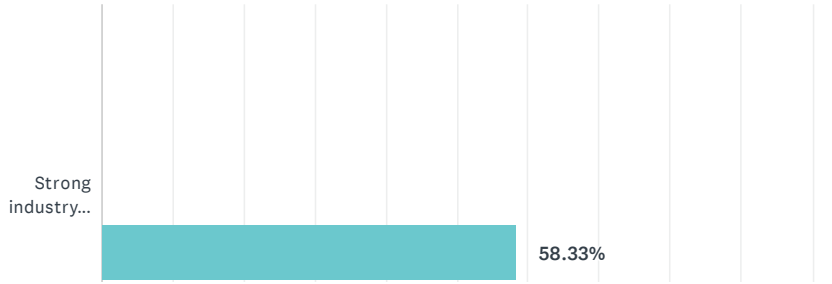


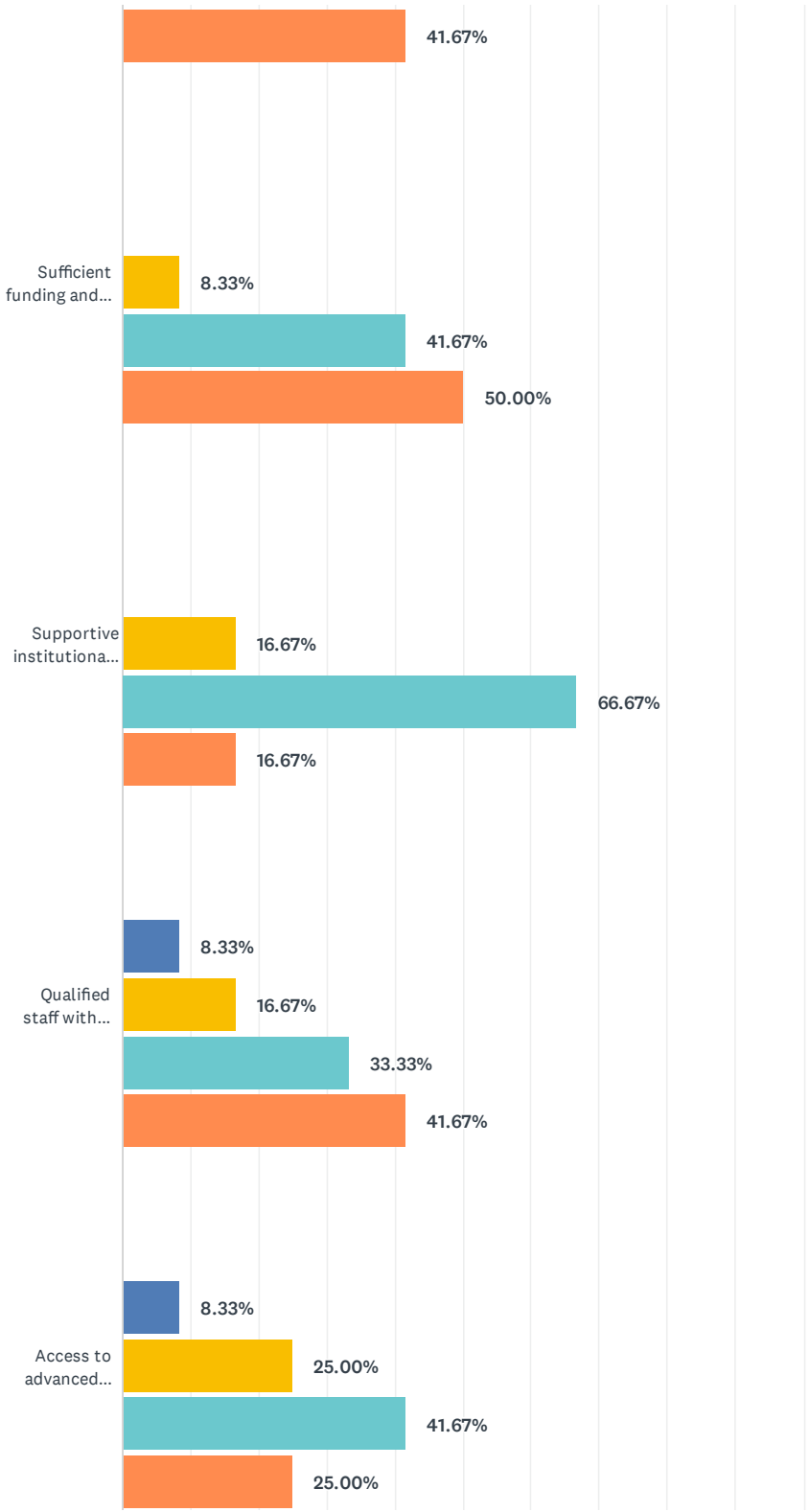
ANSWER CHOICES	RESPONSES	
Government grants	69.23%	9
Private investors	38.46%	5
Research partnerships	69.23%	9
Funding from companies	46.15%	6
Other (please specify)	15.38%	2
Total Respondents: 13		

#	OTHER (PLEASE SPECIFY)	DATE
1	European grants	10/12/2023 1:20 PM
2	subsidie via subsidieverstrekkers	9/28/2023 8:36 AM

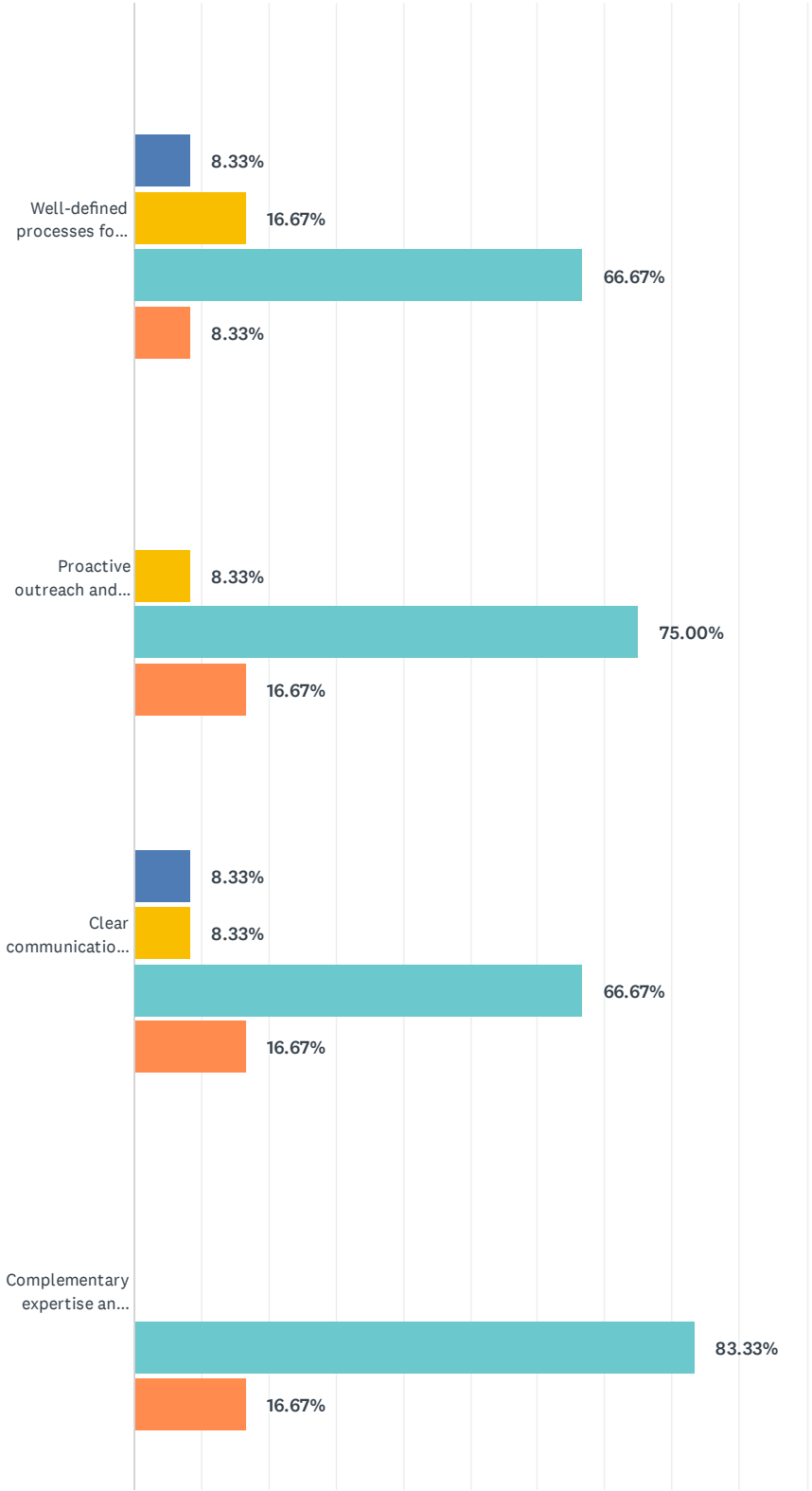
Q19 How would you rate the key elements that can contribute to a successful applied research collaboration between VET institutions and companies? Please rate the following key elements on a scale from 1 to 5

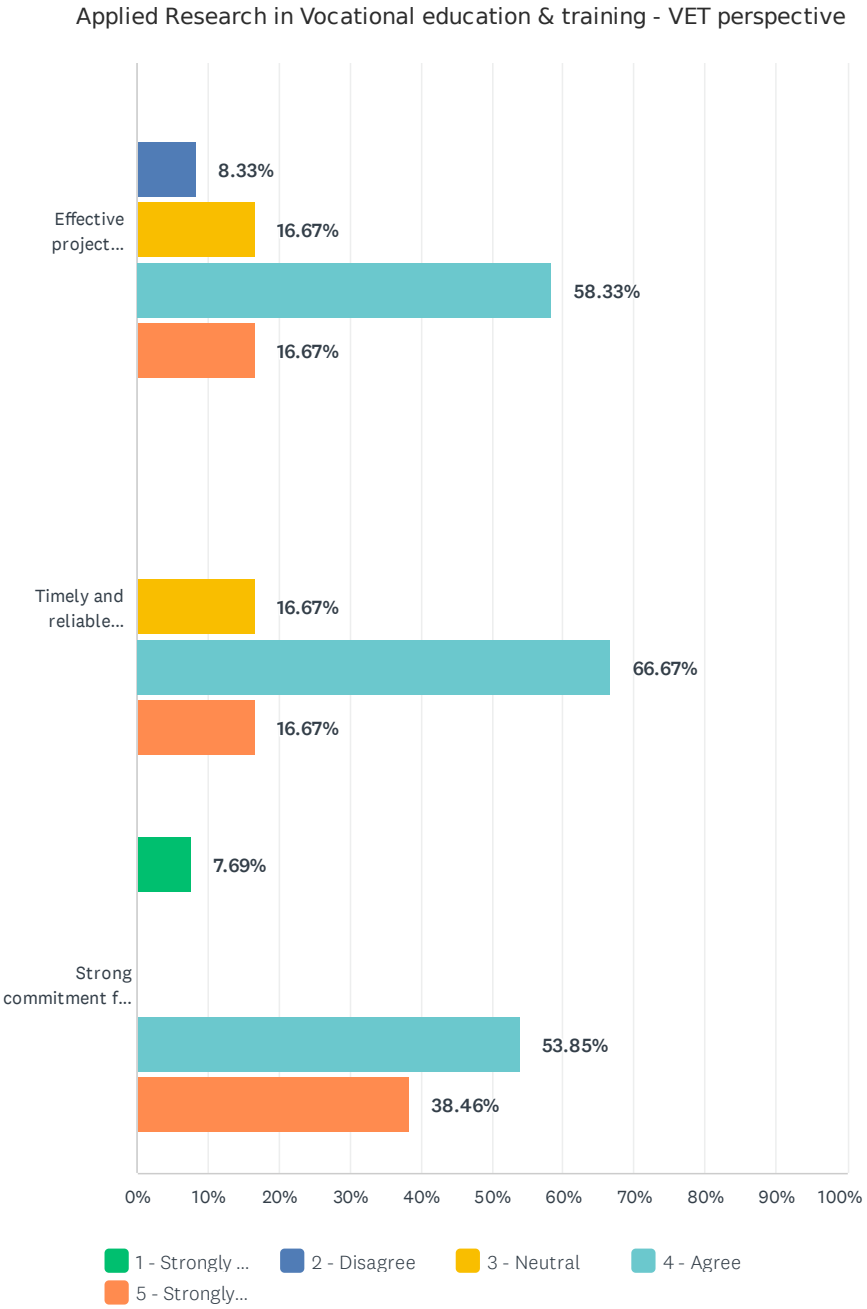
Answered: 13 Skipped: 27




41.67%
Sufficient funding and...
8.33%
41.67%
50.00%
Supportive institutiona...
16.67%
66.67%
16.67%
8.33%
Qualified staff with...
16.67%
33.33%
41.67%
8.33%
Access to advanced...
25.00%
41.67%
25.00%

Applied Research in Vocational education & training - VET perspective

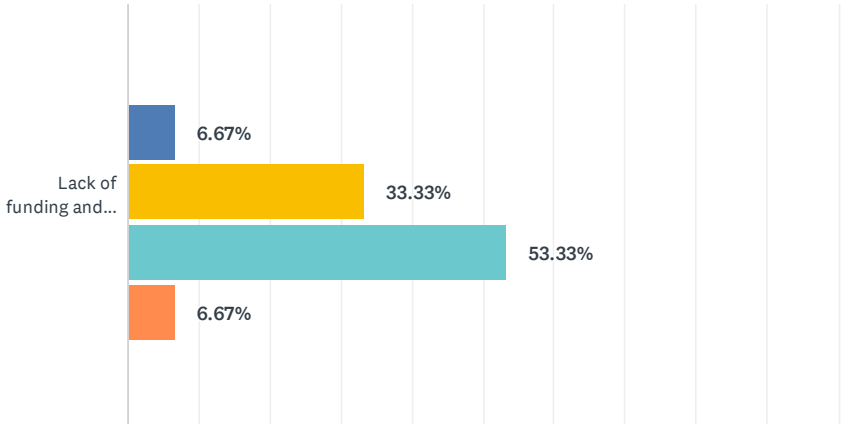


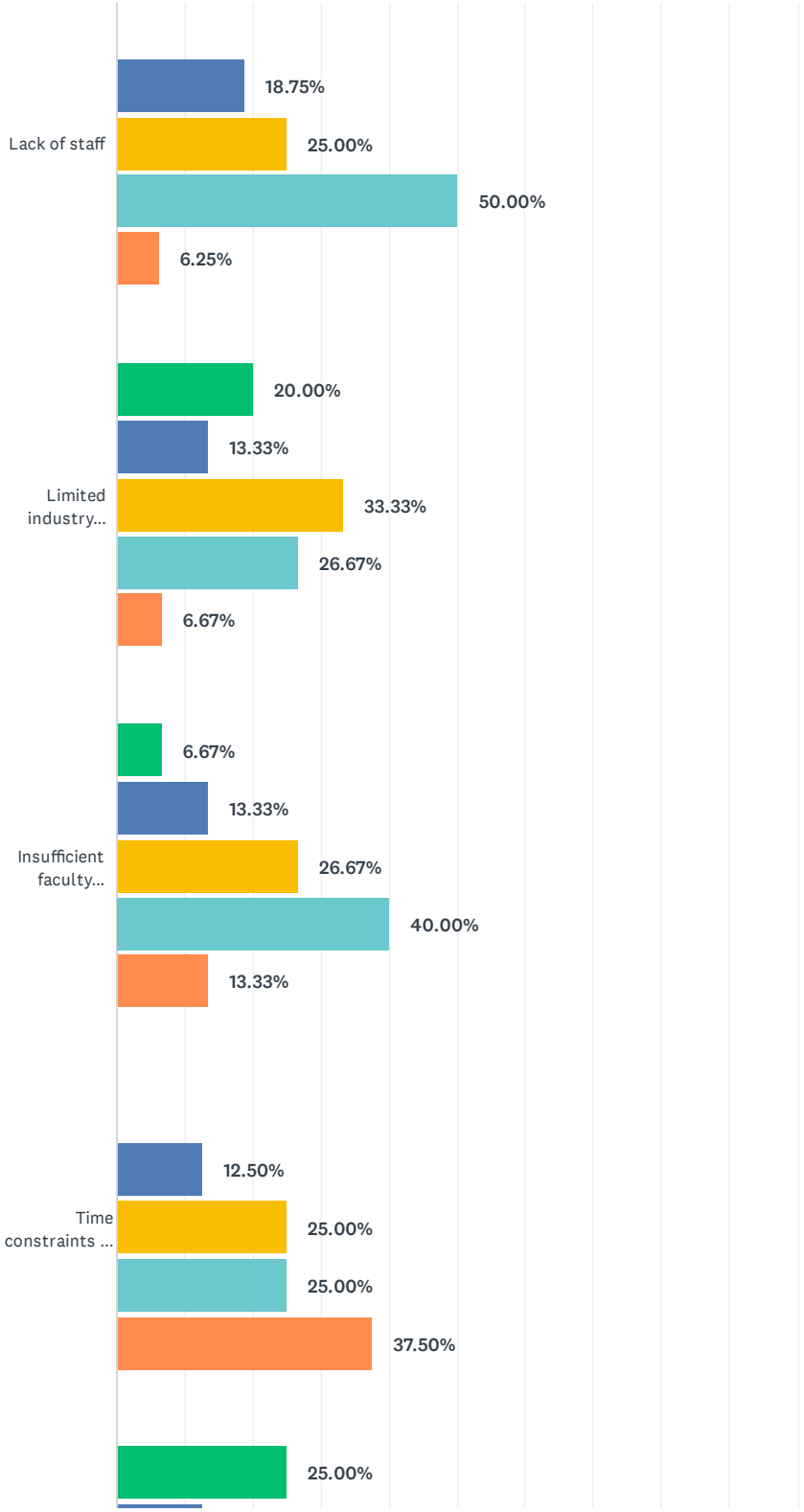

Applied Research in Vocational education & training - VET perspective
Effective project...
8.33%
16.67%
58.33%
16.67%
Timely and reliable...
16.67%
66.67%
16.67%
7.69%
Strong commitment f...
53.85%
38.46%
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
1 - Strongly ...
2 - Disagree
3 - Neutral
4 - Agree
5 - Strongly...

	1 - STRONGLY DISAGREE	2 - DISAGREE	3 - NEUTRAL	4 - AGREE	5 - STRONGLY AGREE	TOTAL	WEIGHTED AVERAGE
Strong industry partnerships and collaborations	0.00% 0	0.00% 0	0.00% 0	58.33% 7	41.67% 5	12	4.42
Sufficient funding and resources	0.00% 0	0.00% 0	8.33% 1	41.67% 5	50.00% 6	12	4.42
Supportive institutional leadership	0.00% 0	0.00% 0	16.67% 2	66.67% 8	16.67% 2	12	4.00
Qualified staff with research expertise	0.00% 0	8.33% 1	16.67% 2	33.33% 4	41.67% 5	12	4.08
Access to advanced technology or equipment	0.00% 0	8.33% 1	25.00% 3	41.67% 5	25.00% 3	12	3.83
Well-defined processes for project management and implementation	0.00% 0	8.33% 1	16.67% 2	66.67% 8	8.33% 1	12	3.75
Proactive outreach and promotion of collaboration opportunities to companies	0.00% 0	0.00% 0	8.33% 1	75.00% 9	16.67% 2	12	4.08
Clear communication channels	0.00% 0	8.33% 1	8.33% 1	66.67% 8	16.67% 2	12	3.92
Complementary expertise and resources	0.00% 0	0.00% 0	0.00% 0	83.33% 10	16.67% 2	12	4.17
Effective project management	0.00% 0	8.33% 1	16.67% 2	58.33% 7	16.67% 2	12	3.83
Timely and reliable deliverables	0.00% 0	0.00% 0	16.67% 2	66.67% 8	16.67% 2	12	4.00
Strong commitment from both parties	7.69% 1	0.00% 0	0.00% 0	53.85% 7	38.46% 5	13	4.15

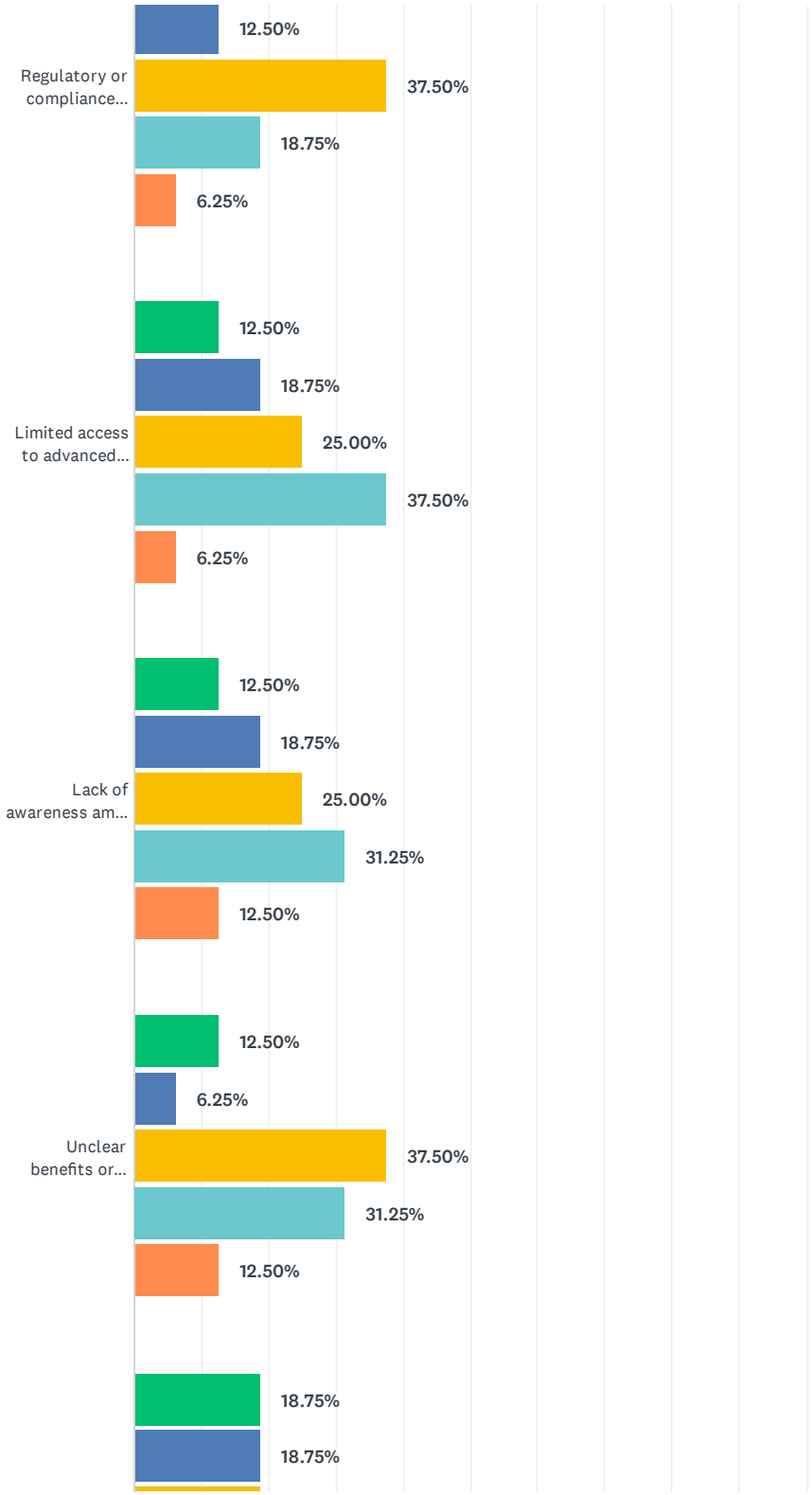
Q20 Please rate the main reasons why your VET institution has not collaborated with a company on applied research projects.Please rate the following barriers on a scale from 1 to 5

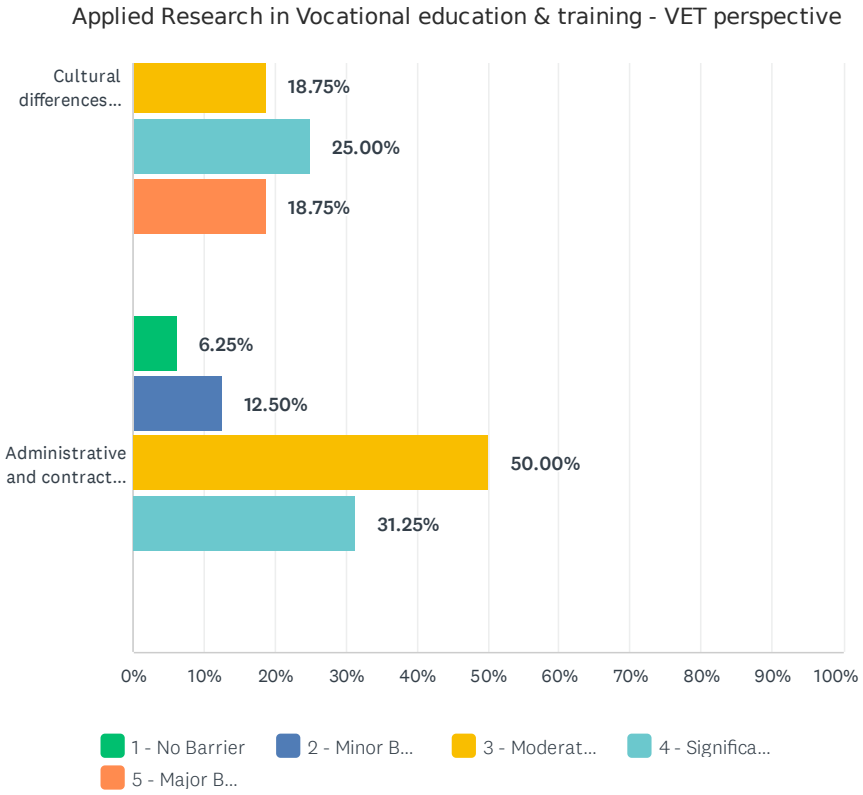
Answered: 16 Skipped: 24




Lack of staff
18.75%
25.00%
50.00%
6.25%
Limited industry...
20.00%
13.33%
33.33%
26.67%
6.67%
Insufficient faculty...
6.67%
13.33%
26.67%
40.00%
13.33%
Time constraints ...
12.50%
25.00%
25.00%
37.50%
25.00%

Applied Research in Vocational education & training - VET perspective



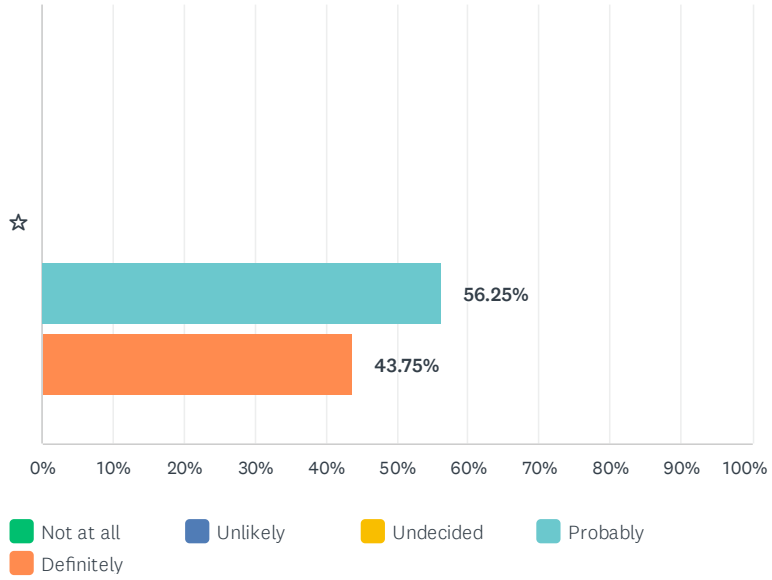

Applied Research in Vocational education & training - VET perspective
Cultural differences...
18.75%
25.00%
18.75%
6.25%
12.50%
Administrative and contract...
50.00%
31.25%
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
1 - No Barrier
2 - Minor B...
3 - Moderat...
4 - Significa...
5 - Major B...

	1 - NO BARRIER	2 - MINOR BARRIER	3 - MODERATE BARRIER	4 - SIGNIFICANT BARRIER	5 - MAJOR BARRIER	TOTAL	WEIGHTED AVERAGE
Lack of funding and resources	0.00% 0	6.67% 1	33.33% 5	53.33% 8	6.67% 1	15	3.60
Lack of staff	0.00% 0	18.75% 3	25.00% 4	50.00% 8	6.25% 1	16	3.44
Limited industry partnerships	20.00% 3	13.33% 2	33.33% 5	26.67% 4	6.67% 1	15	2.87
Insufficient faculty expertise in research and innovation	6.67% 1	13.33% 2	26.67% 4	40.00% 6	13.33% 2	15	3.40
Time constraints and heavy workload	0.00% 0	12.50% 2	25.00% 4	25.00% 4	37.50% 6	16	3.88
Regulatory or compliance issues	25.00% 4	12.50% 2	37.50% 6	18.75% 3	6.25% 1	16	2.69
Limited access to advanced technology or equipment	12.50% 2	18.75% 3	25.00% 4	37.50% 6	6.25% 1	16	3.06
Lack of awareness among companies about collaboration opportunities	12.50% 2	18.75% 3	25.00% 4	31.25% 5	12.50% 2	16	3.13
Unclear benefits or relevance	12.50% 2	6.25% 1	37.50% 6	31.25% 5	12.50% 2	16	3.25
Cultural differences between education institutions and industry	18.75% 3	18.75% 3	18.75% 3	25.00% 4	18.75% 3	16	3.06
Administrative and contractual complexities	6.25% 1	12.50% 2	50.00% 8	31.25% 5	0.00% 0	16	3.06

#	OTHER (PLEASE SPECIFY)	DATE
1	VET does not have a history in research like universities do. So it is not a given that VET does research in collaboration with companies. We are also formal no knowledge institute (by law). That means we have a lack of research funding.	11/8/2023 7:51 AM
2	N/A	9/29/2023 4:09 PM

Q21 Would you consider collaborating with a company on future applied research projects?

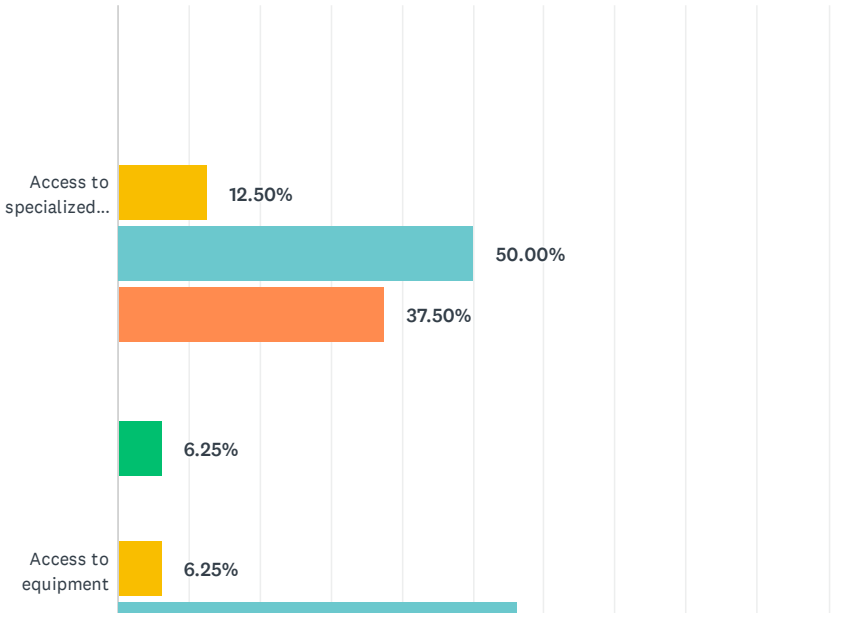
Answered: 16 Skipped: 24



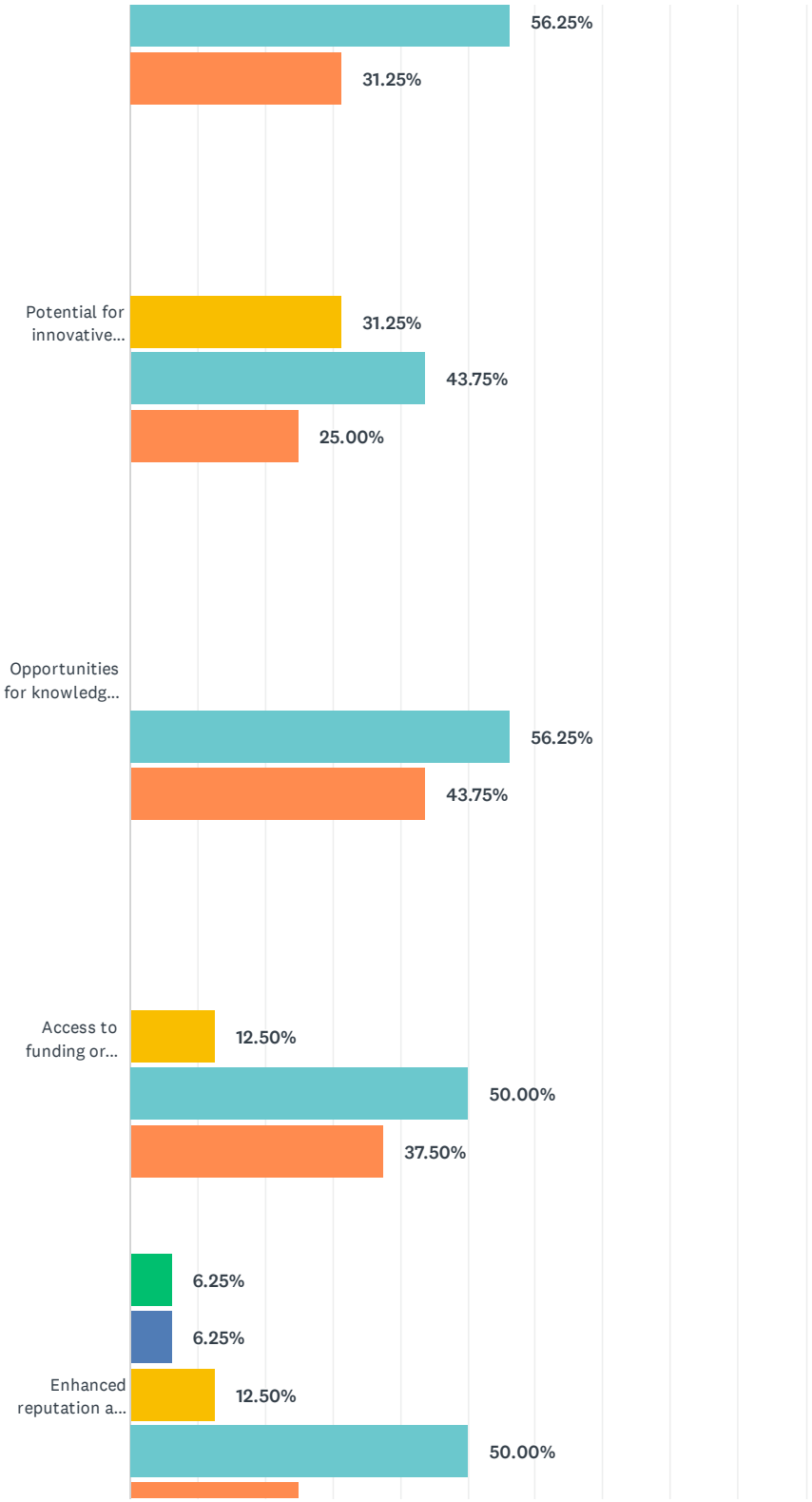
	NOT AT ALL	UNLIKELY	UNDECIDED	PROBABLY	DEFINITELY	TOTAL	WEIGHTED AVERAGE
☆	0.00% 0	0.00% 0	0.00% 0	56.25% 9	43.75% 7	16	4.44

Q22 Please indicate what would motivate you to collaborate with companies on applied research projects?

Answered: 16 Skipped: 24



Applied Research in Vocational education & training - VET perspective



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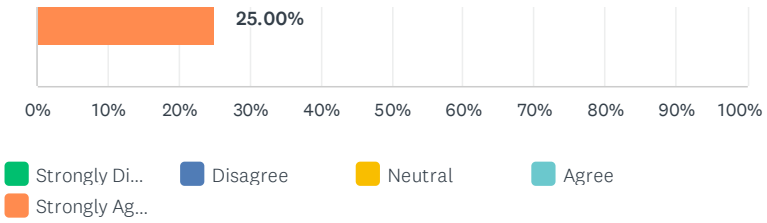
Applied Research in Vocational education & training - VET perspective

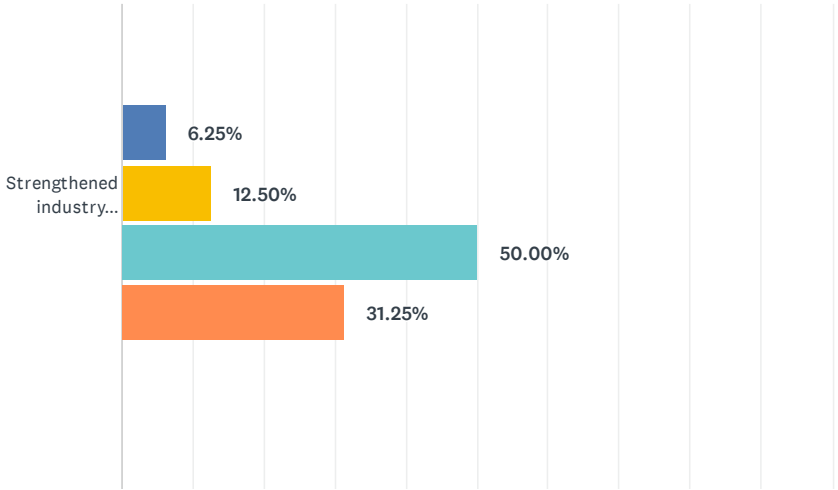


	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE	TOTAL	WEIGHTED AVERAGE
Access to specialized knowledge and expertise	0.00% 0	0.00% 0	12.50% 2	50.00% 8	37.50% 6	16	4.25
Access to equipment	6.25% 1	0.00% 0	6.25% 1	56.25% 9	31.25% 5	16	4.06
Potential for innovative solutions to business challenges	0.00% 0	0.00% 0	31.25% 5	43.75% 7	25.00% 4	16	3.94
Opportunities for knowledge exchange and networking	0.00% 0	0.00% 0	0.00% 0	56.25% 9	43.75% 7	16	4.44
Access to funding or grants for collaborative projects	0.00% 0	0.00% 0	12.50% 2	50.00% 8	37.50% 6	16	4.25
Enhanced reputation and visibility in the industry	6.25% 1	6.25% 1	12.50% 2	50.00% 8	25.00% 4	16	3.81

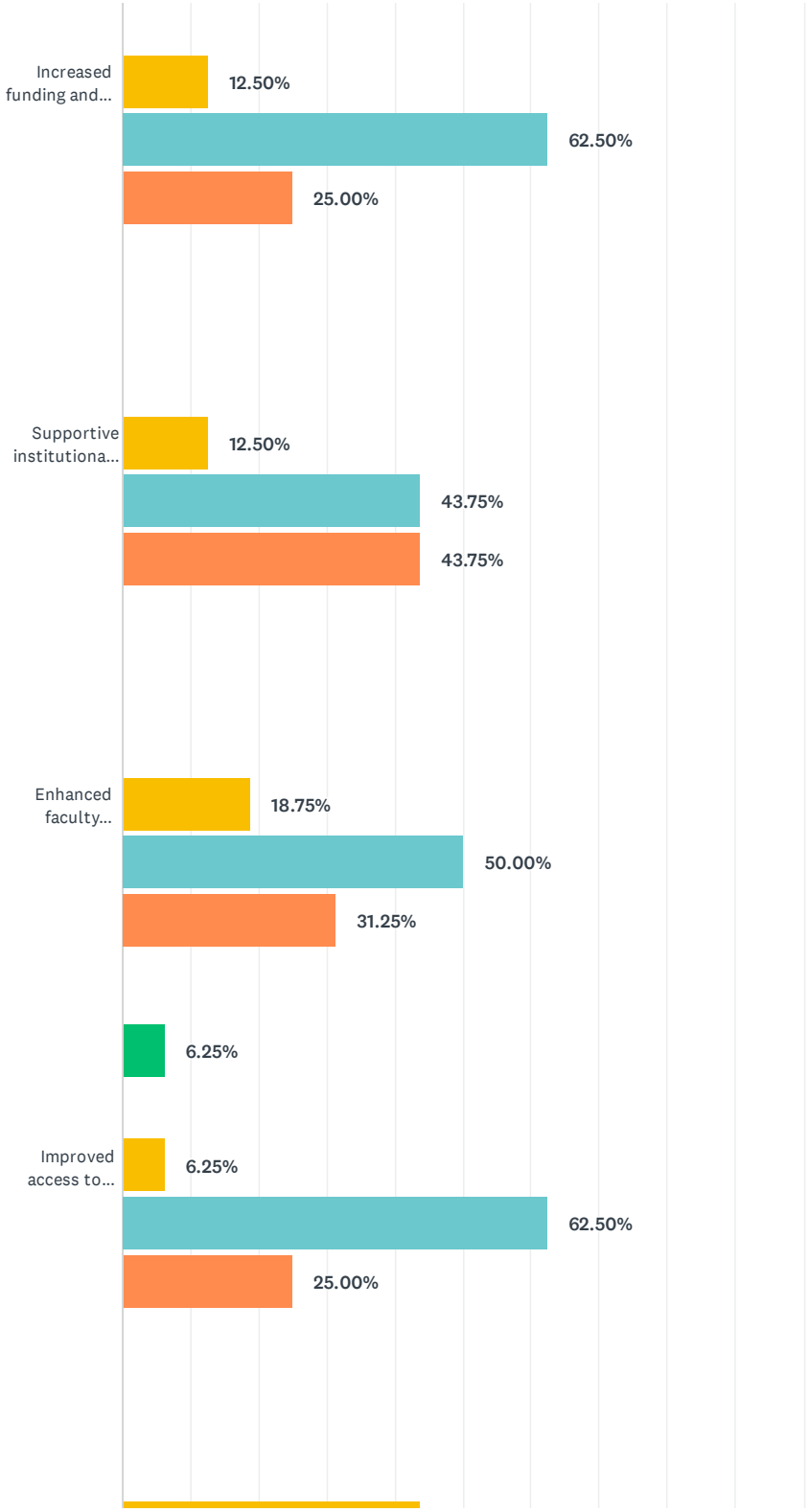
#	OTHER (PLEASE SPECIFY)	DATE
1	Inhoudelijke en onderwijskundige ontwikkeling van het onderwijs	11/30/2023 9:30 AM

Q23 Please rate the key conditions that need to be met in order to undertake applied research projects with companies.Please rate the following key conditions on a scale from 1 to 5

Answered: 16 Skipped: 24



Applied Research in Vocational education & training - VET perspective



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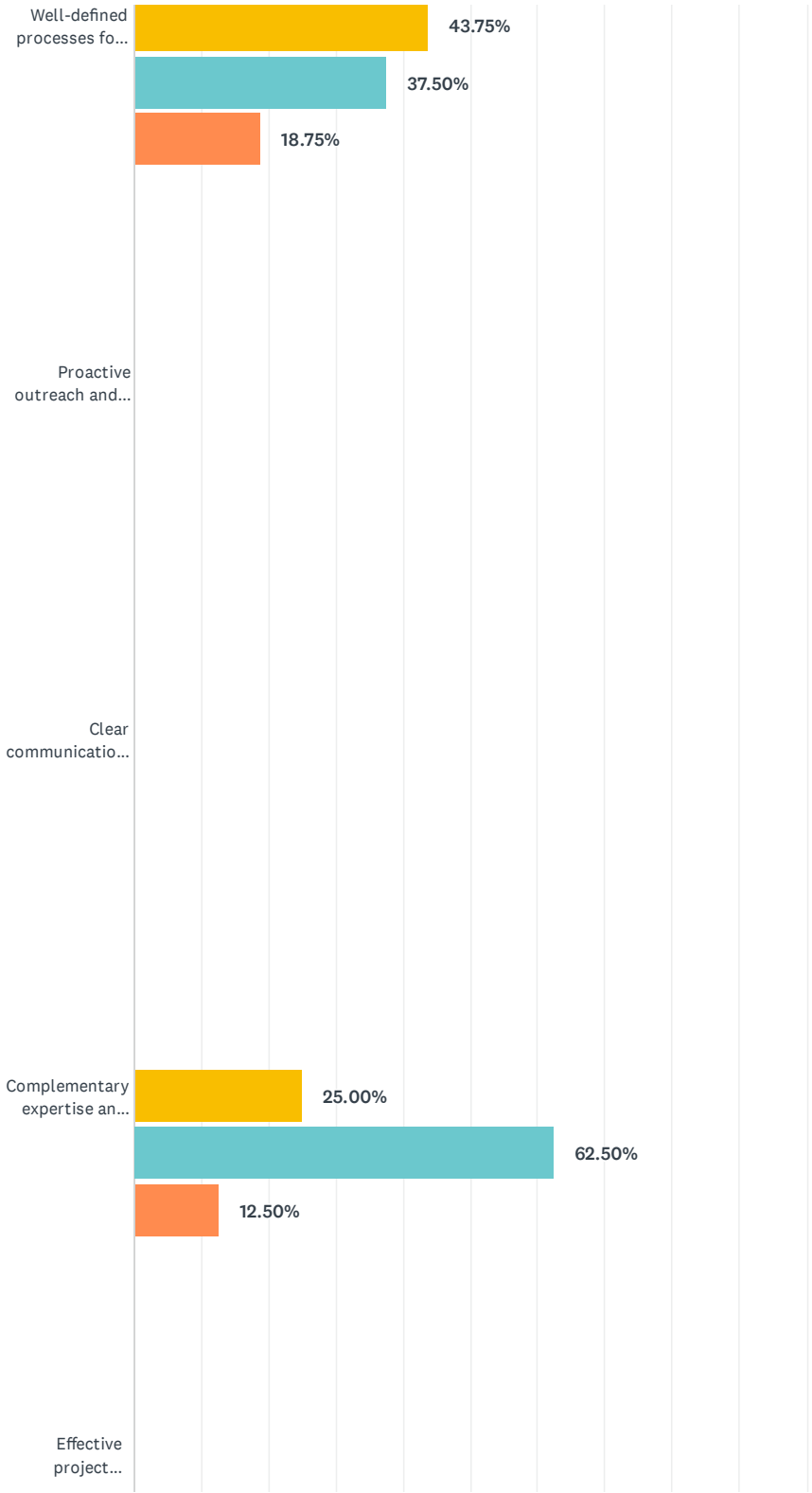
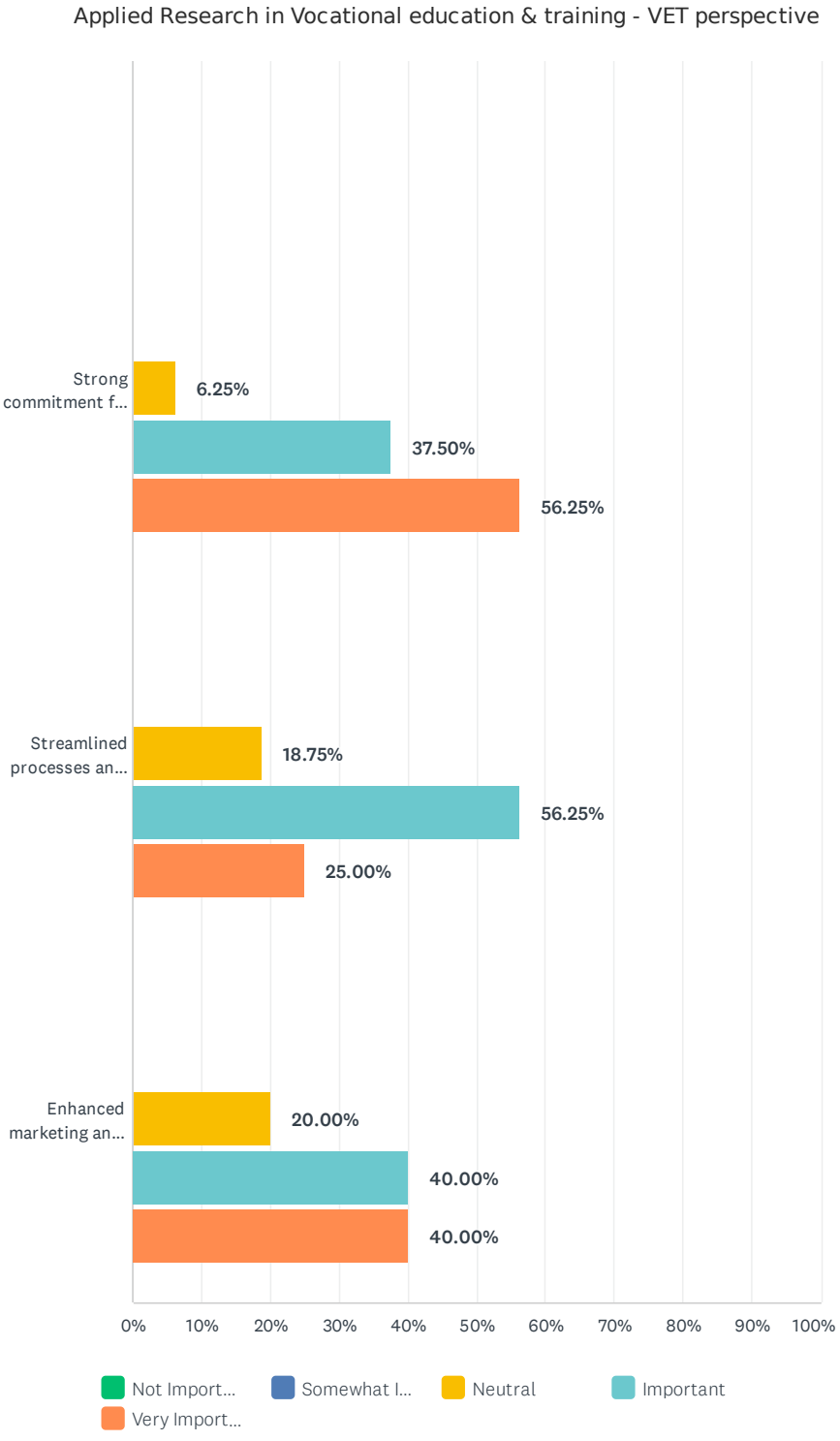
Applied Research in Vocational education & training - VET perspective




Applied Research in Vocational education & training - VET perspective
Strong commitment f...
6.25%
37.50%
56.25%
Streamlined processes an...
18.75%
56.25%
25.00%
Enhanced marketing an...
20.00%
40.00%
40.00%
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Not Import...
Somewhat I...
Neutral
Important
Very Import...

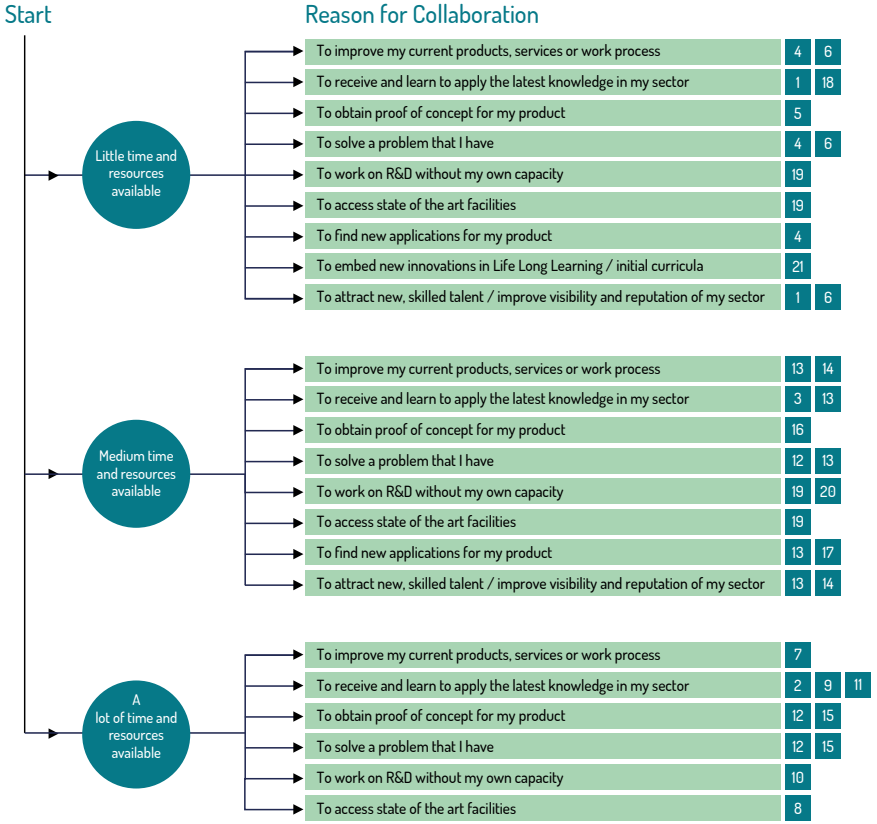
Applied Research in Vocational education & training - VET perspective

	NOT IMPORTANT	SOMEWHAT IMPORTANT	NEUTRAL	IMPORTANT	VERY IMPORTANT	TOTAL	WEIGHTED AVERAGE
Strengthened industry partnerships and collaborations	0.00% 0	6.25% 1	12.50% 2	50.00% 8	31.25% 5	16	4.06
Increased funding and resources allocation	0.00% 0	0.00% 0	12.50% 2	62.50% 10	25.00% 4	16	4.13
Supportive institutional leadership	0.00% 0	0.00% 0	12.50% 2	43.75% 7	43.75% 7	16	4.31
Enhanced faculty training and expertise development in research and innovation	0.00% 0	0.00% 0	18.75% 3	50.00% 8	31.25% 5	16	4.13
Improved access to advanced technology or equipment	6.25% 1	0.00% 0	6.25% 1	62.50% 10	25.00% 4	16	4.00
Well-defined processes for project management and implementation	0.00% 0	0.00% 0	43.75% 7	37.50% 6	18.75% 3	16	3.75
Proactive outreach and promotion of collaboration opportunities to companies	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0	0.00
Clear communication channels	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0	0.00
Complementary expertise and resources	0.00% 0	0.00% 0	25.00% 4	62.50% 10	12.50% 2	16	3.88
Effective project management	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0	0.00
Strong commitment from both parties	0.00% 0	0.00% 0	6.25% 1	37.50% 6	56.25% 9	16	4.50
Streamlined processes and reduced administrative burden	0.00% 0	0.00% 0	18.75% 3	56.25% 9	25.00% 4	16	4.06
Enhanced marketing and awareness efforts to promote collaboration opportunities	0.00% 0	0.00% 0	20.00% 3	40.00% 6	40.00% 6	15	4.20

#	OTHER (PLEASE SPECIFY)	DATE
1	N/A	9/29/2023 4:09 PM

APPENDIX 4 – DECISION TREE

Online decision tree: https://airinvet.eu/tools/decision-tree/
Offline decision tree: Decision tree numbers (airinvet.eu)



Form of Collaboration

1	Attend showcases of graduation projects, company network opportunities and open days at the VET centers involved in applied research
2	Develop a learning factory, where the latest innovations can be implemented and tested by workers/teachers and students.
3	Develop a program with teachers and students to translate the latest academic insights in concrete blogs/ vlogs for your workers
4	Give a project assignment to a team of students/ teachers
5	Give a specific assignment to students for data collection and monitoring
6	Have a student work as an apprentice on an assignment in your company, under supervision of his teachers
7	Have your employees work together with the teachers and students on a structural basis.
8	Invest in a joint research facility with the VET school, other companies and government, to make facilities available that would not be in reach for any of the individual organizations
9	Invest with other partners in the position of a practor (eg dedicated person acting as a knowledge broker)
10	Invest with the VET school, regional government
11	Make time available for your workers to work with the teachers and students on the latest innovations and facilities
12	Paid assignment to the VET center
13	Participate in or organize a Hackathon/ Makethon
14	Set up a program with the VET school as part of the curriculum, so successive teams of students can work on improving your products
15	Set up test site at the school or at your company and have teachers/researchers work on it
16	Set up test sites, with students doing the data collection under supervision of teachers
17	Showcase your product to other partners in the regional network, brought together by the VET center
18	Subscribe to a newsletter of the VET center, involved in applied research
19	Use/rent the facilities of VET centers
20	VET centers can bring together start-ups and companies to develop joint innovation activities
21	Work with teachers on updating the curriculum

Collaboration examples

1
- Adegi

2
- EURASHE – Clemet
- HP – Mohawk
- KTP – Duurzaamheidsfabriek
- Tknika

3
- Practoraat Healthy Urban Living in NL

4
- BHH – orange engineering
- BHH – SAL
- HP – Mohawk
- HP – Beer flavored ice cream
- HP CubeSAT
- HP NEW bruswick cases
- IMH – EKINTZA MAchining
- IMH – Formula Student
- ISSO – The Talent Atelier
- KTP – Duurzaamheidsfabriek
- KTP – 3DMZ
- KTP – cleantech Centre
- Tknika – Tkgune

5
- KTP – Data Innovation hub
- KTP – DIHUB
- KTP – digital workplace

6
- Tknika – Tkgune

8
- KTP – Water Application Centre

9
- KTP – Duurzaamheidsfabriek
- KTP – 3DMZ
- KTP – practorate green livable cities

10
- Tknika – Bizkaia

11
- EURASHE – FAIR
- KTP – Duurzaamheidsfabriek
- KTP – 3DMZ
- KTP – Water Appication Centre

12
- EURASHE – HAMK
- KTP – Duurzaamheidsfabriek
- Tknika – Tkgune

13
- KTP - Practoraat healthy urban living in NL
- KTP – Duurzaamheidsfabriek
- KTP – 3DMZ
- KTP - Barcove
- Tknika – Bizkaia
- Tknika – Ekingune

14
- EURASHE – Big Flash

16
- HP – Bolt
- HP Estonia
- IMH – Aguas Nuevas

19
- EURASHE – Big Flash
- EURASHE – AlgebraLAB
- HP New Brunswick cases
- KTP – Duurzaamheidsfabriek
- KTP - 3DMZ
- Tknika

20
- EURASHE - Gemini
- Tknika – FVEM
- IMH

21
- BHH-MESA - use of media in welding training focused on the use of digital media for vocational training in the welding industry
- BHH- Futurebox for vetinary assistants
- IMH – Aguas Nuevas
- IMH – San Valero Pinacho
- Tknika – Miguel Altuna
- KTP – Centre of expertise event technology

APPENDIX 5 – AIRINVET CURRICULUM TEMPLATE

AIR IN VET

Applied Innovation and Research in Vocational Education and Training

AIRinVET Curriculum Template

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Education and Culture Executive Agency (EACEA). Neither the European Union nor EACEA can be held responsible for them.

Executive summary

In order to assure a consistence in all the training materials created within the project, we will use the so-called AIRinVET curriculum template. The template includes the main relevant sections of the curriculum, objectives, targets, learning outcomes, contents, technologies, learning methodologies, delivery mechanisms.

This template will be used for all the train the trainers material elaborated in the interventions of work package 5.

List of acronyms and abbreviations

AIRinVET: Applied Research and Innovation in Vocational Education and Training
AR: Applied Research
SME: Small and medium-sized enterprise
R&D: Research & development
VET: Vocational education and training

You may also consult the Glossary that was produced as part of the project:
www.airinvet.eu/tools/glossary/

Content

1. Introduction

About the AIRinVET project

The AIRinVET project is a two-year Erasmus+ funded project with the aim to drive European economic competitiveness and support the green and digital transition through the promotion of applied innovation and research (AIR) in vocational education and training (VET) for SMEs and industry.

About the AIRinVET Curriculum Template

The following AIRinVET curriculum template has been developed to serve as a foundational framework to ensure uniformity and coherence across all training materials generated within the project.
The AIRinVET curriculum template encompasses various sections, such as objectives, targets, duration, contents, methodologies, and assessment.

This curriculum template can be adapted and customized based on the specific needs and context of the respective training.

2. Learning objectives

Please define the concrete learning objectives. Determine the level of learning objectives for each dimension. Follow the table below to identify the learning objectives for your training.

		DIMENSION			
		Functions	Innovation/ Research	Governance/ Organizational Management	Impact
		- Activities that the VET centre carries out -Type of organization and Academic profile	-Research capacity, research areas/fields -Research Methods -Research outputs -Agents involved/Ecosystem	-Strategies for AR -Barriers, enablers	-Target groups, impact, assessment methods -Motivation, mind-sets, incentives
LEARNING CATEGORY	Knowledge				
	Comprehension				
	Application				
	Analysis				
	Synthesis				
	Evaluation				

(List the learning objectives)

e.g.: By the end of the course, the learner will be able to:

- Distinguish between various research methods employed within the organisation.
- Reflect on the different functions carried out within the organisation.

3. Target groups

Please describe the target group(s) of the training.

The target groups for the training encompass a diverse array of professionals, depending on the regional ecosystem, such as:

- Teachers, trainers, researchers (EQF levels, teaching field, teacher qualifications)
- College/Higher Education Institution Management (EQF, teaching field, qualification)
- Students (EQF, learning field)
- Companies (size, sector)
- Chambers of commerce, trade associations, development agencies (sector)
- Project officers/manager
- Policy advisors, governmental agencies
- NGOs
- ...

4. Duration

Please describe the duration of the training as well as the implementation timeline of the training.

The approximate time duration for the interventions[1] is foreseen to be a total of 1-day and take place between March to June 2024.

Please describe the stages of the preparation and the actual training
e.g.:

- Defining the objectives
- Recruitment of participants
- Finalisation of the training agenda
- Organisation of practical details
- Any other stage you have foreseen in the preparation and conduction of the intervention

[1] WP5 interventions' training

5. Training content

Please provide a comprehensive description of the concrete trainings content, e.g. with concrete modules and a program schedule.

Detailed program:

Date (Day, Month, Year)			
Time	Content	Training provider	Comments

Content details:

- Aim:
- Duration:
- Introduction
- Topic X:
- Topic Y:
- Conclusion:

6. Teaching methodologies

Please describe which teaching methodologies will be employed, e.g. lectures, group discussions, case studies, hands-on activities, practical exercises, etc.

7. Assessment

Please illustrate how the training participants will be assessed throughout or after the training and attach potential questionnaires or similar.

- Assessment of participants' reaction and satisfaction to the training program. Methods e.g.: questionnaire, Q&A at the end of the session
- Assessment of learning objectives achievement. Choose the method according to the learning objectives.

8. Certification

Please specify whether the training participants will receive a certificate upon completion of the training and include the template in the appendix. The certification may be issued by the hosting organisation or external partners.

Certificates to be considered:

- Participation certificate with learning objectives and their assessment.
- Knowledge/competence certificate.

9. Resources

Please list the resources relevant for the training.

- Books, publications, reference materials
- Articles, research papers, conference papers
- Case studies and institutional models (e.g. examples of interventions or programs already in place)
- Multimedia (e.g. videos, interactive tools)
- Online courses, modules, tutorials
- Expert speakers, industry professionals
- Training materials (handouts, templates, posters)
- ...

Colophon

AIRinVET partners: TKNIKA - Department of education Basque Government, EURASHE, Berufliche Hochschule Hamburg, Hanse Parlament, KATAPULT, ISSO, AFM Cluster for Advanced & Digital Manufacturing and IMH - Advanced and Digital Manufacturing Campus.

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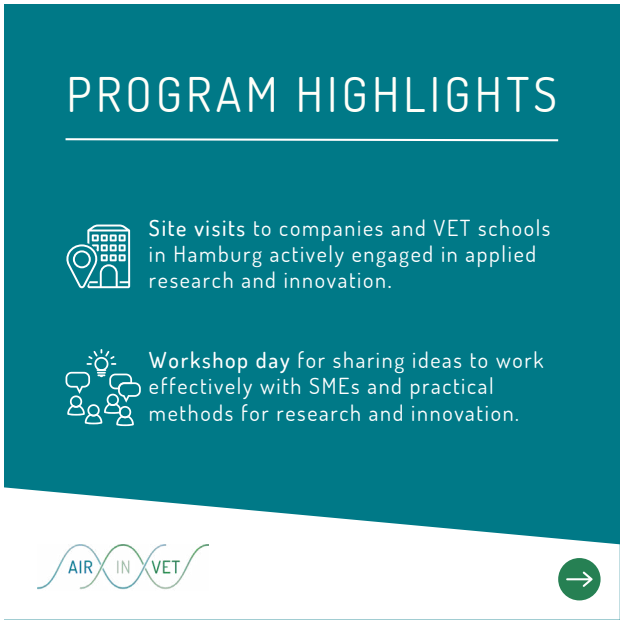
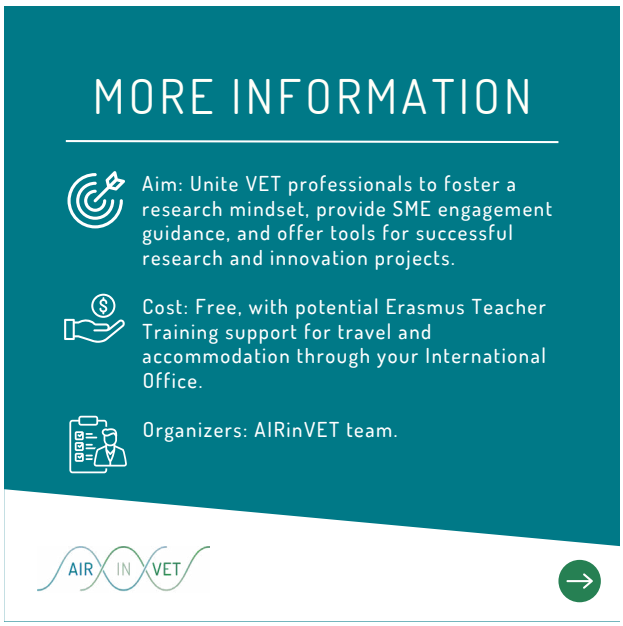
APPENDIX 6 – VET TEACHER AND MANAGER TRAINING

Call to join the VET teacher and manager training in Hamburg 2024





AIR IN VET

Applied Innovation and Research in Vocational Education and Training

WP3 Training for VET teachers and managers on how to involve SMEs in AIRinVET

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Executive summary

The following presents the curriculum for a training aimed at Vocational Education and Training teachers and managers on how to involve SMEs in AIRinVET. The training was developed as part of work package 3 and took place on January 23-25, 2024 in Hamburg, Germany. The training spans two days of days of various site visits to different Applied Research and VET institutions, followed by a one day interactive workshop. The training is designed to equip participants with practical insights and strategies to foster fruitful collaborations between SMEs and vocational education and training entities within the context of applied research initiatives.

List of acronyms and abbreviations

AIRinVET: Applied Research and Innovation in Vocational Education and Training
AR: Applied Research
SME: Small and medium-sized enterprise
R&D: Research & development
VET: Vocational education and training

You may also consult the glossary that was produced as part of the AIRinVET project: www.airinvet.eu/tools/glossary/

Content

1. Introduction

About the AIRinVET project

The AIRinVET project is a two-year Erasmus+ funded project with the aim to drive European economic competitiveness and support the green and digital transition through the promotion of applied innovation and research (AIR) in vocational education and training (VET) for SMEs and industry.

About the AIRinVET Training for VET teachers and managers on how to involve SMEs

The following training program is designed to empower VET teachers and managers with the requisite knowledge and skills to effectively engage with SMEs on applied research and innovation activities. Through targeted learning experiences and interactive workshops, this training endeavors to equip participants with practical strategies and insights crucial for fostering meaningful collaboration and innovation.

2. Training objectives

The objective of this training program is to bring together VET teachers who want to engage in applied research and innovation projects with companies, particularly Small and Medium Enterprises (SMEs). The program aims to foster an applied research mindset, provide guidance on effective engagement with SMEs, and offer practical tools and recommendations for successful applied research and innovation projects. It empowers them to contribute to the development of innovative solutions while fostering collaboration between VET centres, SMEs, and the broader innovation ecosystem in their region.

3. Target groups

The training program is specifically tailored for VET teachers and managers who are interested in fostering innovation and engaging in applied research initiatives. These individuals play a pivotal role in shaping the educational landscape and are instrumental in facilitating collaborations between educational institutions and SMEs.

For the training session in Hamburg, the AIRinVET partners spread the invitation to their network and associated partners.

4. Duration

The training is designed for three consecutive days, with two days of site visits and one full workshop day. Concrete dates: 23-25th of January 2024 (travel days: 22nd and 26th of January 2024, 23rd & 24th site visits , 25th workshop day).

5. Training content

Day 1: Site visit to a VET provider
Day 2: Site visit to company
Day 3: Workshop day

Detailed program:

Monday, January 22nd 2024			
Time	What	Who	Comments
All day	Arrival day	Training participants	Hotel recommendation: **Super 8 by Wyndham Hamburg Mitte** Wikingerweg 4, 20537 Hamburg
Tuesday, January 23rd 2024			
Time	What	Who	Comments
08:30	Meeting at Berufliche Hochschule Hamburg (BHH) and 20min. walk to site visit	Training participants & Henning	Address; Berufliche Hochschule Hamburg (BHH) Anckelmannstraße 10, 20537 Hamburg
09:00 - 12:30	Site visit: Berufliche Schule Stahl- und Maschinenbau BS04	Training participants & Henning	Address; Berufliche Schule Stahl- und Maschinenbau BS04 Angerstraße 7-11, 22087 Hamburg
12:45 - 13:45	Lunch (pay at own costs)	Training participants & Henning	Address: Schweinske Lübecker Str. 84, 22087 Hamburg
14:00 - 17:00	Continuation site visit at Berufliche Schule Stahl- und Maschinenbau BS04	Training participants & Henning	Introduction of BHH and AIRinVET project
18:30 – 21:00	Joint dinner with AIRinVET project partner		Address:

			Open Kitchen Große Elbstraße 133, 22767 Hamburg
Wednesday, January 24th 2024			
Time	**What**	**Who**	**Comments**
10:00 – 12:00	The Dual System of VET and Applied Research - a fit for both sides	Training participants & Henning	Address: Berufliche Hochschule Hamburg (BHH) Anckelmannstraße 10, 20537 Hamburg
12:00 – 13:00	Leaving for site visit by public transport, light lunch on the go		
13:00 – 17:00	Site visit: ZAL (https://zal.aero/)	Training participants & Henning	Address: ZAL Zentrum für Angewandte Luftfahrtforschung Hein-Saß-Weg 22, 21129 Hamburg
Thursday, January 25th 2024 **Venue:** Berufliche Hochschule Hamburg (BHH) Anckelmannstraße 10, 20537 Hamburg. Room: 13.02.26			
Time	**What**	**Who**	**Contents**
9:00 – 10:30	Block 1: Mapping the Regional Applied Research and Innovation Ecosystem - Looking outside	Katapult	Aim: Map the regional ecosystems • Overview of the local innovation ecosystem. • Identifying key stakeholders in the region, including businesses, research institutions, and governmental bodies. • Analyzing the strengths and weaknesses of the regional innovation landscape. • Creating a map of potential partner SMEs in the region.
10:30 – 10:45 Coffee break			
10:45 – 11:30	Block 2: Identifying self capacity for AR - Looking inside	Tknika	Aim: Provide context and bigger applied research and innovation landscape on VET level • Identifying self capacity for AR using the dimensions

			created on the mapping process • Definition of different categories of VET systems
11:30 – 12:30	Block 3: Applied Research and Innovation	BHH	Aim: Define applied research and innovation with concrete methods • Overview of research methodologies for applied research projects. • Creativity and problem-solving techniques. • Prototyping and testing.
12:30 – 13:30 Lunch			
13:30 – 15.00	Block 4: Recommendations and Tools	Tknika & Katapult	Aim: Showcase concrete tools to foster an applied research mindset in VET organisations working with SMEs • Strategies to create an applied research mindset among teachers. • Step-by-step decision tree for on how to engage SMEs. • Assessing the red lines (barriers) for change within VET centres.
15:00 – 16:30	Block 5: Getting Into Action	Hanse Parlament & Katapult	Aim: Exchange • Building and maintaining relationships with SMEs, research institutions, and other stakeholders. • Effective communication strategies. • Conflict resolution and negotiation skills. • Techniques for assessing SMEs' readiness for collaboration. • Identifying common challenges and opportunities when working with SMEs. • Pitch training - presenting project ideas to potential SME partners.
16:30 – 17:00	Wrapping up and evaluation		

Block 1: Mapping the Regional Applied Research and Innovation Ecosystem (Katapult)

Aim: Map the regional ecosystems (outside – in)

- Overview of the local innovation ecosystem.
- Identifying key stakeholders in the region, including businesses, research institutions, and governmental bodies.
- Analyzing the strengths and weaknesses of the regional innovation landscape.
- Creating a map of potential partner SMEs in the region.

This session is designed to provide VET teachers and managers with a tool for stakeholder mapping of their existing and target innovation ecosystem. And a second tool for SWOT analysis of the innovation ecosystem. The tools will be explained and the participants will fill in the formats together in pairs.
The results will be discussed in group discussions and updated based on inspiration of the fellow groups and feedback. The results will be an overview of actions to be taken to further develop the innovation ecosystem.

Duration: 1,5 h

Introduction (5 minutes)
- Welcome and short introduction round
- Brief overview of topic and objectives

Topic 1: Stakeholder mapping (45 minutes)
Intro 5 minutes:
- Understanding the Importance of stakeholders in the region
- Explaining the stakeholder model

Workshop 20 minutes
- Working individually or in pairs to fill in the model per region and topic with sticky notes on posters

Pitch & feedback 15 minutes
- In 2 groups: pitch the stakeholder mapping
- Give feedback to each pitch on sticky notes

Conclusion 5 minutes
- Update or add based on the feedback

Topic 2: SWOT analysis (30 minutes)

Intro 5 minutes:

- Explaining the SWOT analysis tool with some examples
- Train-the-trainer – make a start and use in the team when back at school

Workshop 20 minutes

- Working individually or in pairs to fill in the model per region and topic with sticky notes on posters – start with external (opportunities and threats)

Follow-up 5 minutes

- Group discussion on the process
- Next steps – validate external and take internal to block 2

Conclusion (10 minutes)

- Recap of Key Takeaways
- Resources and Tools for Continued Learning
- Closing Remarks and Thank You

Block 2: AIRINVET Project Overview (Tknika)

Aim: Identifying self-capacity for AR (inside out)

- Identifying self capacity for AR using the dimensions created on the mapping process
- Definition of different categories of VET systems

This block will focus on giving tools to the different vocational and educational training centres to carry out a self-diagnosis of the situation of the centre regarding applied research. To do so, we will first explain the dimensions created in the AIRinVET project mapping and the templates created to carry out the mapping interviews. Afterwards, using this information, a workshop will be held and each participant will carry out a self-diagnosis of their centre using the different dimensions that will be explained in the same way as the workshop. To conclude, and after analysing each centre, we will define in which category each trainee will be placed.

Duration: 45 minutes

Introduction (5 minutes)

- Welcome and short introduction round

- Brief overview of topic and objectives

Topic 1: Identifying self capacity for AR using the dimensions (30 minutes)

Explanation of the 9 dimensions 5 minutes

- DIMENSION 1: Different type of activities that the organization carries out.
- DIMENSION 2: Type of organization and Academic profile
- DIMENSION 3: Research Methods
- DIMENSION 4: Research outputs
- DIMENSION 5: Agents involved
- DIMENSION 6: Targets, impact, assessment methods
- DIMENSION 7: Motivation, mind-sets, incentives
- DIMENSION 8: Strategies
- DIMENSION 9: Barriers, enablers

Workshop 25 minutes

- Working individually to fill in the model given by the trainer to see where each centre finds his itself according to AR

Topic 2: Identifying each VET centre in a category defined in AIRinVET (10 minutes)

Explanation and identification of each VET centre category (10 minutes)

Conclusion (5 minutes)

Recap the documents filled by the participants and collect them digitally

Block 3: Applied Research and Innovation (BHH)

Aim: Define applied research and innovation with concrete methods

- Overview of research methodologies for applied research projects.
- Creativity and problem-solving techniques.
- Prototyping and testing.

Short summary: During the presentation, the site visits of the last days were discussed. Additionally, the way research and learning in VET is combined at the BHH was discussed, along with several case studies.

Duration: 1 h

Introduction into combining research and learning in VET at BHH.

Discussion on different case studies within the BHH.

Block 4: Recommendations and Tools (Tknika & Katapult)

Aim: Showcase concrete tools to foster an applied research mindset in VET organisations working with SMEs

- Strategies to create an applied research mindset among teachers.
- Step-by-step decision tree for on how to engage SMEs.
- Assessing the redlines for change within VET centres.

Duration: 1,5h

Introduction (10 minutes, TKNIKA + Katapult)
- Brief explanation of AR in Basque Country
    - Identification of the collaboration project
    - Definition of the collaboration project
    - Development of the collaboration project
    - Knowledge transfer

Topic 1: Strategies to create an AR mindset (15 minutes, TKNIKA)
- Creation of a stable work team
    - Solid (trained people with a favorable attitude to the project)
    - Integrated into the centre structure (process map)
    - "Professional" (work procedure/decision tree)
- Definition of functions and responsibilities
    - Management (leadership & people)
    - Coordinator (financial area, identification of opportunities, dissemination)
    - Colleagues (technical area)
- Design of a real (feasible) catalog of collaboration projects
    - Example of TKgune catalog

Topic 2: Decision tree for VET centres on how to engage SMEs (10 minutes)
- Example of the decision tree of Basque country

Topic 3: Assessing the redlines for change (from the SME and VET perspective) (10 minutes)

Topic 4: Decision tree for SMEs on how to engage VET centres (10 minutes)
Steps of the decision tree:
- Starting point of the decision tree is the perspective of a SME or company, starting with the question: 'How much time and resources does the company have available?
- The next step is to have a look at the reason why the company wants to do applied research. (Based on interviews conducted within the AIRinVET project.)

- The third step is to show the company forms of applied research in VET that are available. For each form of applied research, we will give a concrete example, based on the case studies.

Topic 5: Workshop on the decision tree for SMEs (30 minutes)

- Participants get to try out the decision tree in pairs (online or on paper). They will follow the decision tree by answering to the following questions **from the mindset of an (exemplary) SME**:
    - How much TIME and MONEY are available for Applied Research within the SME?
        - Little Time and Resources / Medium Time and Resources / A lot of Time and Resources
    - What reasons do you have to do Applied Research?
        - I want to improve my current products or work process / I want to receive the latest knowledge in my sictor and how to apply it in practice / I need proof of concept for my product / I have a problem that I need solved / I do not have my own RandD capacity / I want state of the art facilities / I want to find new applications for my product / I want to embed new innovations in LLL / initial curricula to train workers and future employees / I want to attract new talent /
- There is no need to go through the entire decision tree, the goal of the workshop is to get a feeling of the different ways SMEs could work with VET centres on Applied Research.
- Feedback on the decision tree will be collected, and based upon this feedback the existing decision tree will be fine-tuned.

Block 5: Getting Into Action (Hanse Parlament)

Aim: Exchange

- Building and maintaining relationships with SMEs, research institutions, and other stakeholders.
- Effective communication strategies.
- Conflict resolution and negotiation skills.
- Techniques for assessing SMEs' readiness for collaboration.
- Identifying common challenges and opportunities when working with SMEs.
- Pitch training - presenting project ideas to potential SME partners.

This session is designed to provide VET teachers and managers with practical insights and skills for fostering successful collaborations with SMEs. Through a combination of interactive discussions and group activities, participants will gain valuable strategies for building and maintaining meaningful partnerships, effective communication, conflict resolution, and assessing SME readiness. The session aims to empower educators to navigate challenges and leverage opportunities in working with SMEs for enhanced vocational education and training outcomes.

Duration: 1,5 h

Introduction (10 minutes)
- Welcome and Icebreaker
- Brief overview of topic and objectives

Topic 1: Building and Maintaining Relationships with SMEs (10 minutes)
- Understanding the Importance of SME Partnerships in VET
- Strategies for Initiating Contact and Establishing Rapport
- Case Studies: Successful Collaboration Stories

Topic 2: Effective Communication Strategies (10 minutes)
- Tailoring Communication to Different Stakeholders
- Clear and Concise Messaging for SME Engagement
- Role-Playing: Communication Scenarios

Topic 3: Conflict Resolution and Negotiation Skills (10 minutes)
- Identifying and Addressing Potential Conflicts
- Techniques for Constructive Negotiation
- Group Activity: Simulated Negotiation Exercise

Topic 4: Assessing SME Readiness for Collaboration (10 minutes)
- Key Indicators of SMEs Ready for Partnership
- Checklist for Assessing Collaborative Potential
- Q&A: Participants' Experiences and Questions

Topic 5: Identifying Challenges and Opportunities (10 minutes)
- Common Challenges in SME Collaboration
- Turning Challenges into Opportunities
- Group Discussion: Sharing Insights and Best Practices

Topic 6: Pitch training - presenting project ideas to potential SME partners (20 minutes)
- The elevator pitch: content
- Design your pitch
- Practice in pairs

Conclusion (10 minutes)
- Recap of Key Takeaways
- Resources and Tools for Continued Learning

- Closing Remarks and Thank You

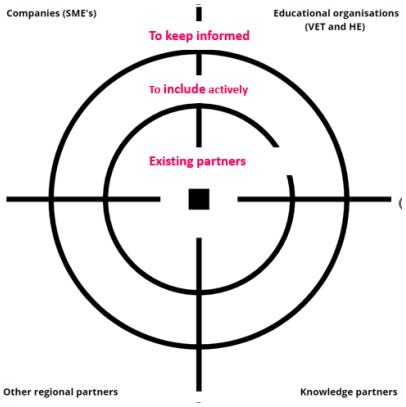
6. Teaching methodologies

Throughout the AIRinVET Training program, a diverse range of teaching methodologies was employed to ensure an engaging and interactive learning experience for participants.

Block 1: Mapping the Regional Applied Research and Innovation Ecosystem (Katapult)

Workshop activity

A model for ecosystem mapping will be used printed on A1 format, see example below. After a sort of introduction, participants will prepare a mapping for their innovation ecosystem (in groups or individually) with sticky notes. Alternatively: use digital Miro board for the exercise.



A SWOT analysis will be done per innovation ecosystem.

Presentation of the results in small groups and discussion on the findings.

Block 2: AIRINVET Project Overview (Tknika)

- Lecture on the dimensions and categories
- Hands-on activity where participants get to describe the situation of their own VET centre in the different dimensions as discussed

Block 3: Applied Research and Innovation (BHH)

- Lecture and group discussion

Block 4: Recommendations and Tools (Tknika & Katapult)

- Lecture
- Hands-on workshop where participants get to pretend to be an SME and study the different ways an SME could collaborate with a VET institution on applied research

Block 5: Getting Into Action (Hanse Parlament)

- Pitching in pairs
- Group Discussion: Sharing Insights and Best Practices
- Q&A: Participants' Experiences and Questions
- Group Activity: Simulated Negotiation Exercise
- Role-Playing: Communication Scenarios
- Case Studies: Successful Collaboration Stories

7. Assessment

As part of the AIRinVET Training program, participants were invited to complete an evaluation form designed to gather feedback and insights about their training experience. This assessment served as a valuable opportunity for participants to reflect on various aspects of the training, including the effectiveness of teaching methodologies, the relevance of content, the quality of facilitation, and overall satisfaction with the program.

8. Certification

Every participant in the training was awarded a certificate in recognition of their active participation.

9. Trainer qualifications

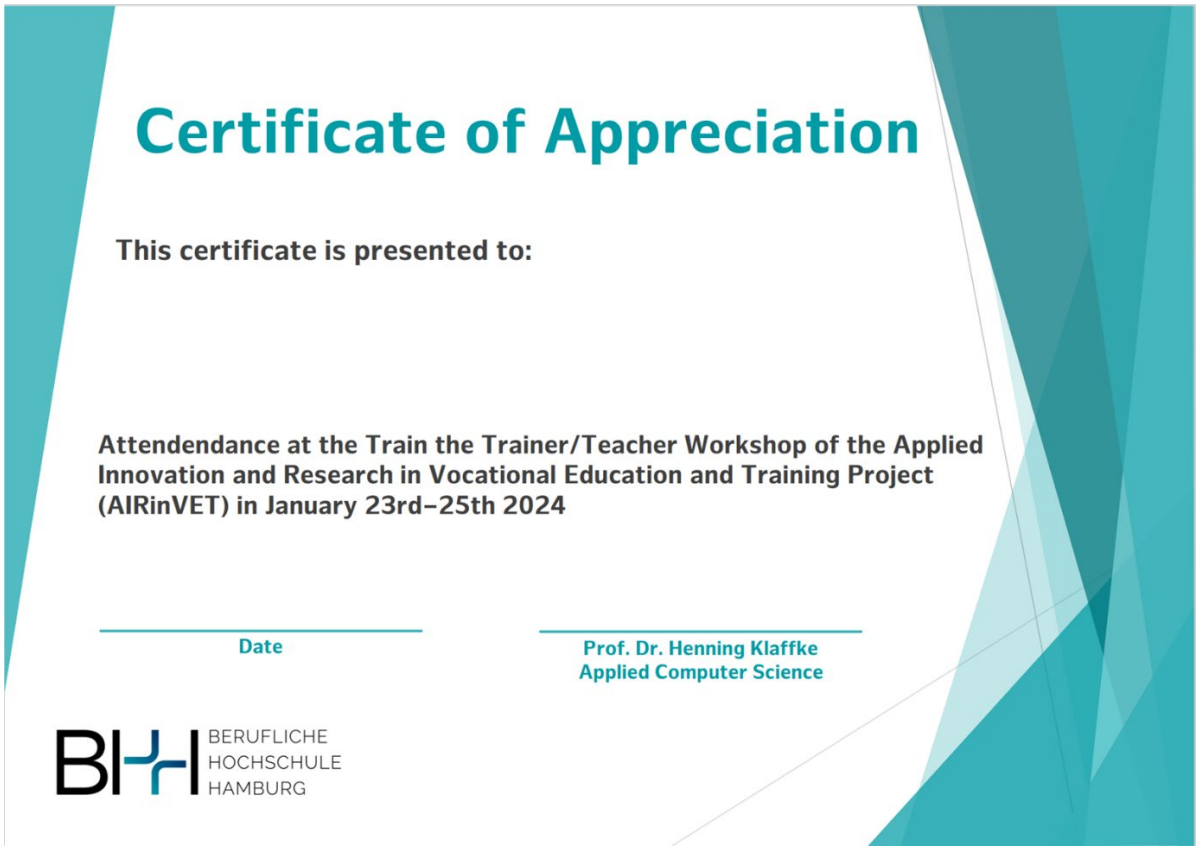
All trainers actively members of the AIRinVET project as partners and serve as experts in their specialized fields. They present knowledge and tools developed by themselves or their respective organizations. Possessing prior experience in delivering the training, they are well-equipped to facilitate the sessions. Their expertise ensures the training remains current, relevant, and highly effective.

10. Resources

The following resources were relevant for the training:

- Trainers for the workshops
- Training materials, including presentations, handouts and sheets to perform the stakeholder analysis
- Training venue at the BHH, including all technological equipment, seating, and facilities
- Guides for the site visits
- Evaluation forms
- Networking opportunities

Attachment 1 – Training certificate template



Attachment 2 – Training invitation

The digital training invitation can be viewed on the AIRinVET website: https://airinvet.eu/news/training-for-vet-teachers-and-managers-on-how-to-involve-smes-in-airinvet/

And here: https://media.licdn.com/dms/document/media/D4D1FAQGthIJQaZdz0g/feedshare-document-pdf-analyzed/0/1701325682844?e=1709164800&v=beta&t=LuMkQ3od2yapgKdvM5oqD3k2rP4rCeglDgH5nrNm0b8

Training for VET teachers and managers on how to involve SMEs in AIRinVET

Are you a teacher or a manager within an institution for Vocational Education and Training (VET)?
And are you interested in how to conduct Applied and Innovative research, in cooperation with Small and Medium sized Enterprises (SMEs)? Then this training is really something for you.

This training is developed within the context of the EU funded project AIRinVET:
Applied and Innovative Research in Vocational Education and Training.

Objective of the training is to bring you together with other VET teachers who are interested in being engaged in applied research and innovation projects with companies, particularly Small and Medium sized Enterprises (SMEs). The program aims to foster an applied research mindset, provide guidance on effective engagement with SMEs, and offers practical tools and recommendations for successful applied research and innovation projects. It will empower you to contribute to the development of innovative solutions while fostering collaboration between VET centres, SMEs, and the broader innovation ecosystem in your region.

This training has **no fee**. In order to pay for your travel and accommodation, you could go to your International Office and apply for an Erasmus Teacher Training.
During the training in Hamburg, we hope to host around 20 participants coming from different countries, mainly from The Netherlands, The Bask Country (Spain) and Germany. You and your colleagues are strongly invited to join this training.

Attachment 3 – Training evaluation form

AIRinVET training evaluation

General

How did you experience the training in general? *

	strongly disagree	disagree	neutral	agree	strongly agree
The overall organisation was good	○	○	○	○	○
The communication about the training was good	○	○	○	○	○
The duration and the schedule for the training were appropriate	○	○	○	○	○
The group size was appropriate	○	○	○	○	○
The overall atmosphere of the training was encouraging	○	○	○	○	○

Comments

Content and methods

How did you experience the training content and methods? *

	strongly disagree	disagree	neutral	agree	strongly agree
The training content met my expectations	○	○	○	○	○
The topics and addressed issues were relevant for me	○	○	○	○	○
The content was well organised and easy to follow	○	○	○	○	○
I gained valuable knowledge from lessons and examples presented during the training	○	○	○	○	○
The site visits on Tuesday and Wednesday were informative and useful	○	○	○	○	○
The training day on Thursday was informative and useful	○	○	○	○	○

Comments

Next steps

Throughout the training we shared various tools and tips with you. Which one do you plan to use soon to involve SMEs in AIRinVET? *

The goal of the training was to share insights on how to involve SMEs in AIRinVET. Was the goal achieved in your opinion? Which part of the training was the most useful to you and why? *

Could you mention in 1-2 sentences what this training has given you? *

What areas of the training could be improved? *

How likely is it that you would recommend the training to others? *

0 1 2 3 4 5 6 7 8 9 10

Do you have any additional comments?

COLOPHON

AIRinVET partners: TKNIKA - Department of education Basque Government, EURASHE, Berufliche Hochschule Hamburg, Hanse Parliament, KATAPULT, ISSO, AFM Cluster for Advanced & Digital Manufacturing and IMH - Advanced and Digital Manufacturing Campus.

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