R4.2 ANNEX 3 – Second workshop on the ASSETs+ Strategy for developing skills and competences for the Defence Sector

Dissemination level: PU (public)

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

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Second workshop on the ASSETs+ Strategy for developing skills and competences for the Defence Sector

The idea behind the Workshop

This workshop was set up to present the preliminary **ASSETs+ Strategy for developing skills and competences for the Defence Sector** to validate the actions and to integrate additional suggestions to improve and finalize it. The final version of the strategy, enriched with the contributions of the workshops, will be released in 2023.

The insights emerged from the desk work of the first year (available in the Annex 1) and the analysis of the workshop of the second year (available in the Annex 2) let the ASSETs+ Consortium frame the following information:

- The **needs** of the sector
- The **goals** to fulfil the need
- The **pillars** to build on a strategic plan
- The **actions** to achieve the goals

The scope of the second workshop is therefore the validation of the actions with reference to the pillars of the strategy, represented in the seat belt in Figure 1 (additional details in the main part of R4.2).

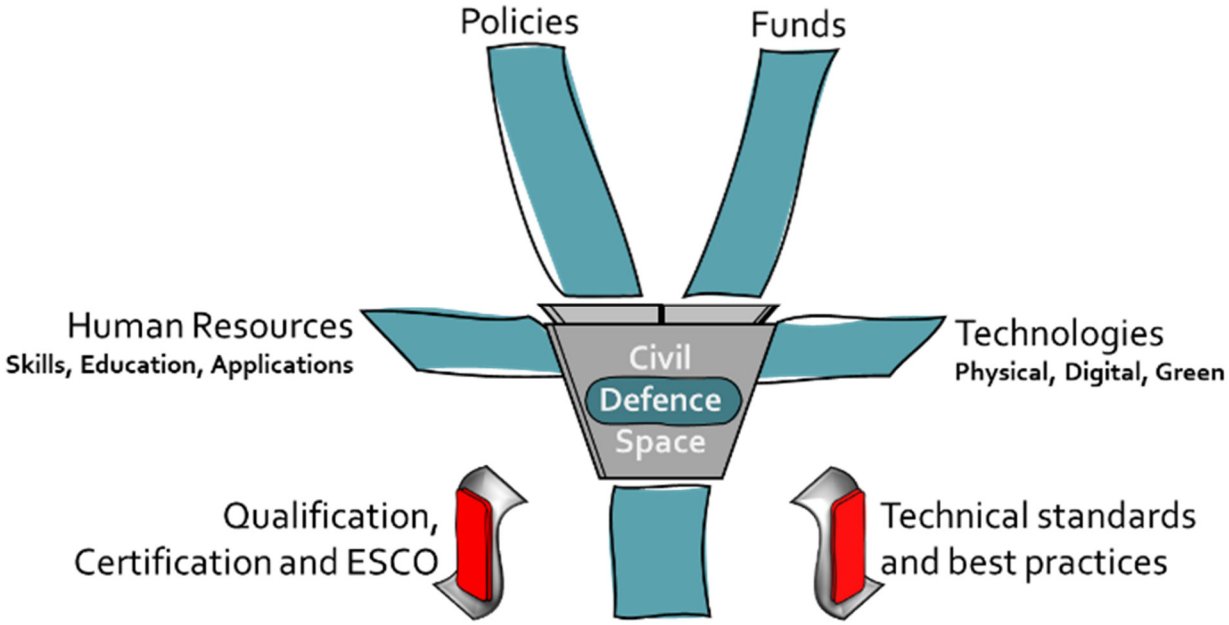


Figure 1 - Framework for the ASSETs+ strategy: 5 points security seat belt.

In particular, the workshop will focus first on the evaluation of the actions proposed in the draft of the strategy by the means of a **questionnaire** addressing two features of the actions: the cost and the impact. The **cost** measures the economic cost for the implementation, the availability of infrastructure, and the effort for implementation (e.g., Are new policies and/or regulations needed? Are the required capabilities available?). The **impact** evaluates the contribution of the given action in realizing the ASSETs+ vision, i.e., "Improve human resource supply chains in the Defence sector, so that graduates will have the right skills for the market and the existing workforce will have reskilling and upskilling opportunities".

Based on the results of the questionnaire, the actions will be positioned in a **two-dimensional space of Cost-Impact**. This space allows to identify types of actions as following indicated:

- *Challenges*: high cost and high impact, actions to purse to obtain a great contribution towards the goals.
- *Wills*: low cost and high impact, actions that can be easily implemented leading to a great contribution towards the goals.
- *Option*: low cost and low impact, actions that may not produce a great contribution towards the goals but can be implemented without a great effort.
- *Hurdles*: high cost and low impact, actions that require a great effort without ensuring a great contribution towards the goals.

The space Cost-Impact is presented in the Figure 2.

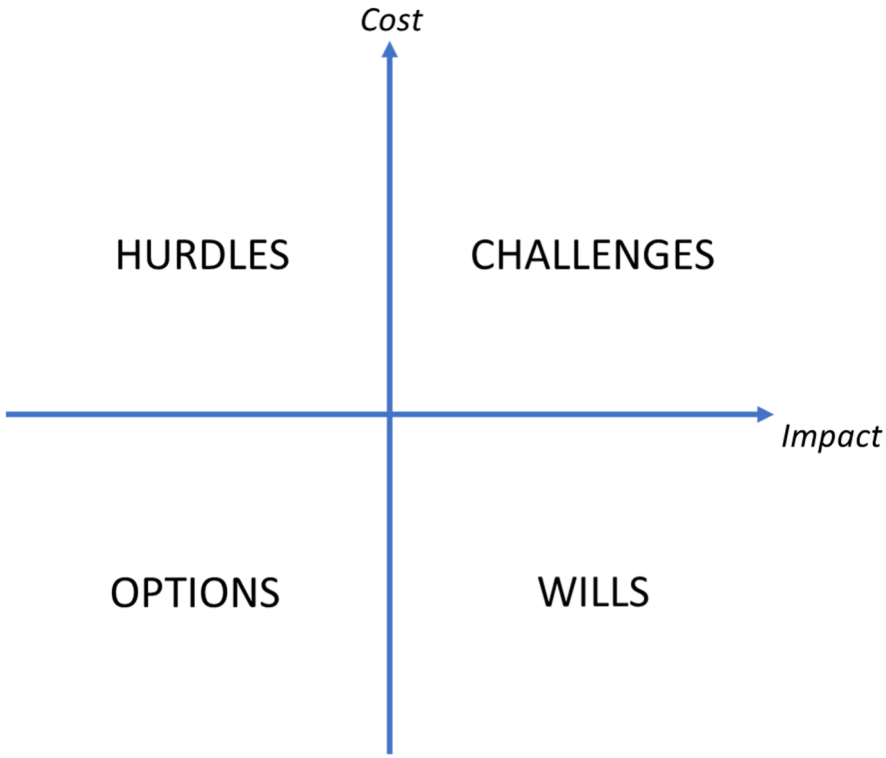


Figure 2 - Space Cost-Impact for the distribution of the actions.

The workshop will be organized in one session divided in two parts.

In the first part, each expert will choose a subset of actions to rate based on their expertise and experience considering the pillars of the ASSETs+ strategy distributed as following:

- TECHNICAL PART: Pillars Technologies and Technical Standards
- SKILLS: Pillar Human Resources
- FRAMEWORKS: Pillars Qualification, Policies, Project and Funds

In the second part, a discussion table will be set up with all the experts involved to evaluate the positions of the actions in the space Cost-Impact. The expected result is a rating of cost and impact of the proposed actions and a series of insights from the discussion table.
The workshop will be a blended event, realized online on MSTeams and in presence at the University of Bordeaux.

Finally, the internal partners will continue the discussion on the collected feedback.

The results of the Workshop

Around 30 experts participated in the sessions, all of them received a summary of the draft version of the strategy one week before the workshop. The workshop has been chaired by University of Pisa (Filippo Chiarello and Irene Spada) and Fondazione Giacomo Brodolini (Liga Baltina). First the description of the project and the approach for developing the Strategy was given. Then the questionnaire was shared to collect feedbacks from experts. They rate each action and suggest additional feedbacks. Finally, the discussion on collected information was set up.

Most of the participants contributed to the pillar of Human Resources (51,9%). The rest is distributed in the remaining pillars (33,3% technologies and technical standards; 14,8% Qualifications, Policies, Projects and Funds). The complete list of responses is fully reported at the end of this document in the section "Responses to the questionnaire collected during the workshop".

The average scores on Cost and Impact for each action has been computed. Those values, reported in Table 1, define the coordinates of each action in the two-dimensional space Cost-Impact.

Action	Cost	Impact	Pillar
1	3,11	3,78	Technology
2	2,78	3,22	
3	3,33	3,00	
4	3,22	3,89	
5	3,11	3,11	
6	4,11	3,33	
7	3,22	4,00	
8	3,22	3,67	Technical Std & Best Practices
9	3,44	3,44	
10	4,11	4,33	
11	3,11	3,22	
12	3,56	3,22	
13	2,86	3,64	Human Resources
14	3,21	3,57	
15	2,86	3,71	
16	3,29	3,43	
17	2,64	3,29	
18	2,71	3,21	
19	3,64	3,36	
20	3,36	3,43	
21	2,50	2,71	
22	3,57	3,93	
23	2,93	3,21	
24	3,79	3,71	
25	3,80	4,20	Qualifications, Certifications &ESCO
26	3,00	3,80	
27	3,60	4,00	
28	2,00	3,60	Projects & Funds
29	2,40	3,00	
30	2,40	3,00	
31	2,00	3,40	
32	2,40	2,80	
33	2,60	3,80	Policies
34	3,00	3,00	
35	2,60	2,80	
36	2,20	2,40	
37	3,20	2,20	

Table 1 - Average scores on Cost and Impact for each action.

Figure 3 reports the distribution of the actions in the space Cost-Impact.

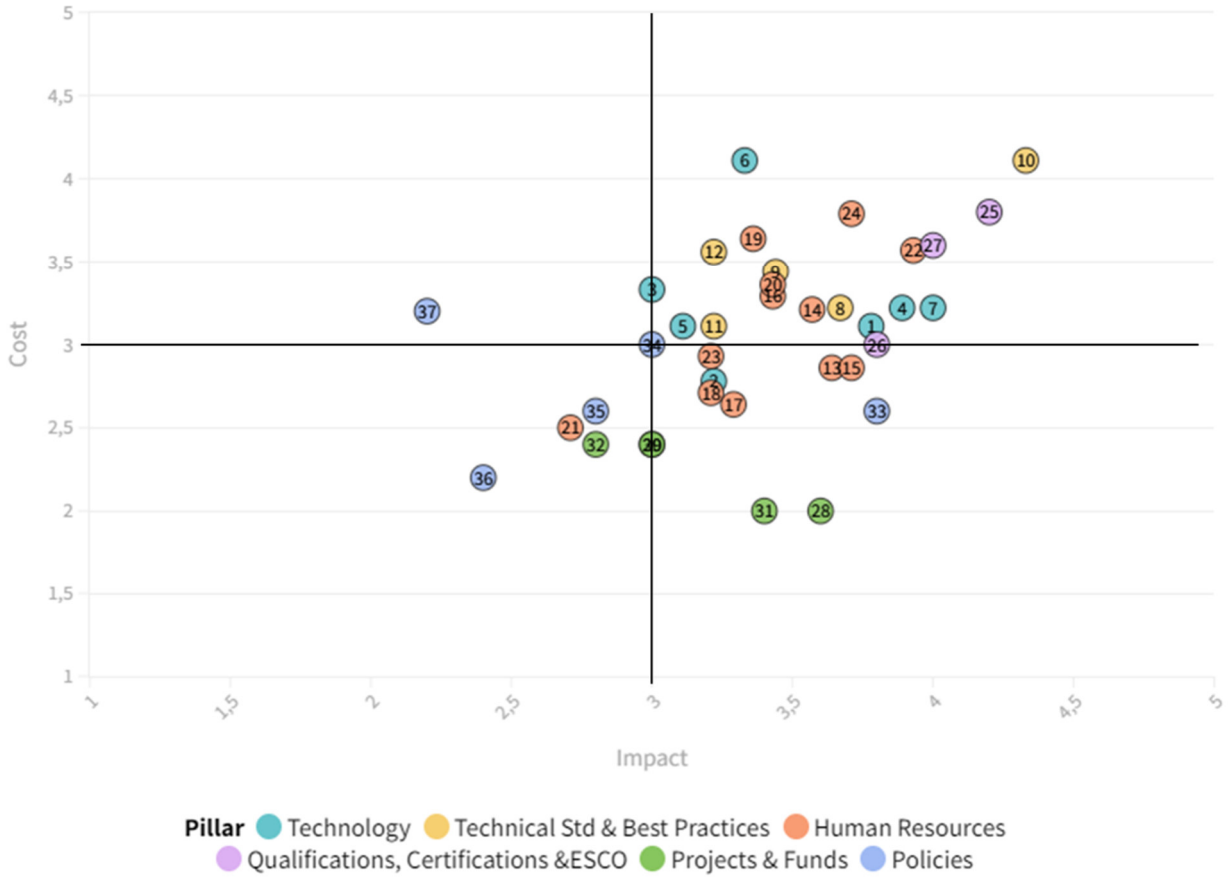


Figure 3 - Two-dimensional Space Cost-Impact for actions distributions.

Most of them resulted to be *Challenges*: 21 actions out of 37 are positioned in the top right quadrant, registering high impact and high cost. The strategic actions proposed can contribute to the achievement of the final goal (i.e., the vision of the project), even though requiring a great effort from actors involved. However, as emerged from the evaluation, it is worth spending such cost for the actions in this category, due to the high beneficial effects for the stakeholders. They mainly belong to the pillars of Technologies and Human Resources, which are the capabilities on which the ASSETs+ project focuses. **Therefore, those actions could be the ones be included in the final version of the ASSETs+ strategy.**

Only one fell in the category of *Hurdles* in the top left quadrant. This action is "Develop and implement EU guidelines for trustworthy artificial intelligence, data protection and confidentiality", with reference to the pillar of Policies. The topic is indeed covered also by the action 9, related to the pillar of Technical Standards; this action, on the contrary, is included in the category of *Challenges*. This difference may suggest a more effective implementation of such action: the channel for this type of initiative regards standardization bodies rather than policies offices. **Therefore, the Consortium will take into consideration such information in the definition of the final version of the ASSETs+ strategy.**

Next, 4 actions (21, 32, 35, and 36) were considered as *Options*, placed in the bottom left quadrant. This position indicates the little contribution of those actions towards the vision of the project. Indeed, they may address a broader perspective. However, the lower cost points out the possibility to leverage on existing initiatives on the same line. **Therefore, the Consortium will not directly address these issues, but could be the ones include these actions as suggestions in the final version of the ASSETs+ strategy.**

The rest belongs to the group of *Wills* in the bottom right quadrant. Those actions can enable a great contribution towards the goals and can be easily implemented. They regard mainly the pillars of Human Resources and Project & Funds, but also the pillars Technology and Policies are present in this quadrant. These actions address initiatives towards reducing the gaps between educational offer and industrial demand and promoting a life-long-learning culture, such as skills intelligence analysis, funding for educational programs, qualification systems. Those elements are cornerstone in the ASSETs+ projects. **Therefore, those actions could be the ones included in the final version of the ASSETs+ strategy.**

Figure 4 reports the interpolation line of the actions in the space Cost-Impact. This line represents in a concise manner the relationship between the two variables in analysis (i.e., Cost and Impact) through a function (in this case we adopt a linear function). We can observe that cost and impact register an increasing positive relation, as the increasing of cost produce an increasing of impact. This rising tendency demonstrate that a greater effort is necessary to produce greater impact. The line does not present a very high slope, therefore a given growth of the impact does not require the same increment in the cost. Indeed, the implementation of many actions can produce joint effects, such as leveraging on existing mechanisms and/or infrastructure, reducing the cost for achieving the expected result. **Therefore, the joint effects among the actions across different pillars will be considered to frame the final version of the ASSETs+ strategy.**

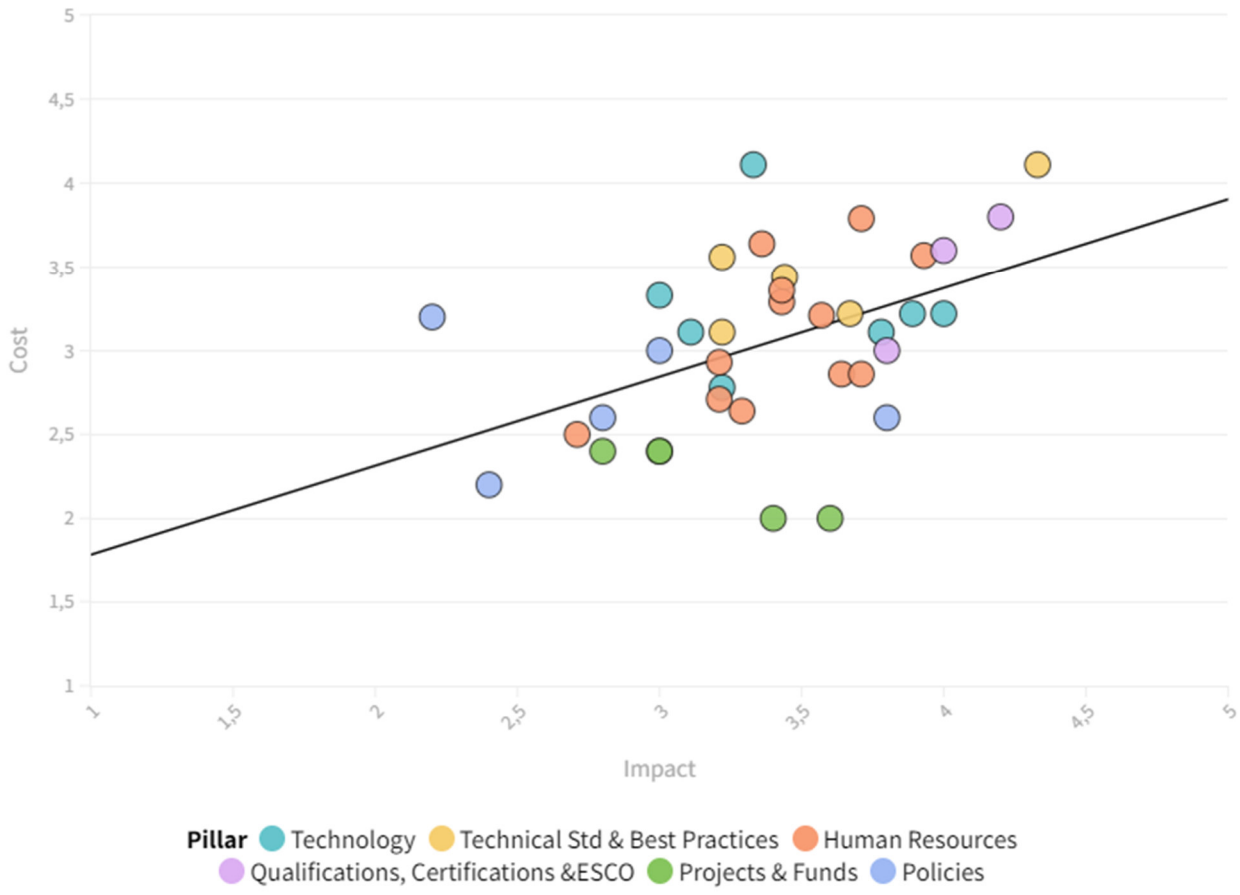
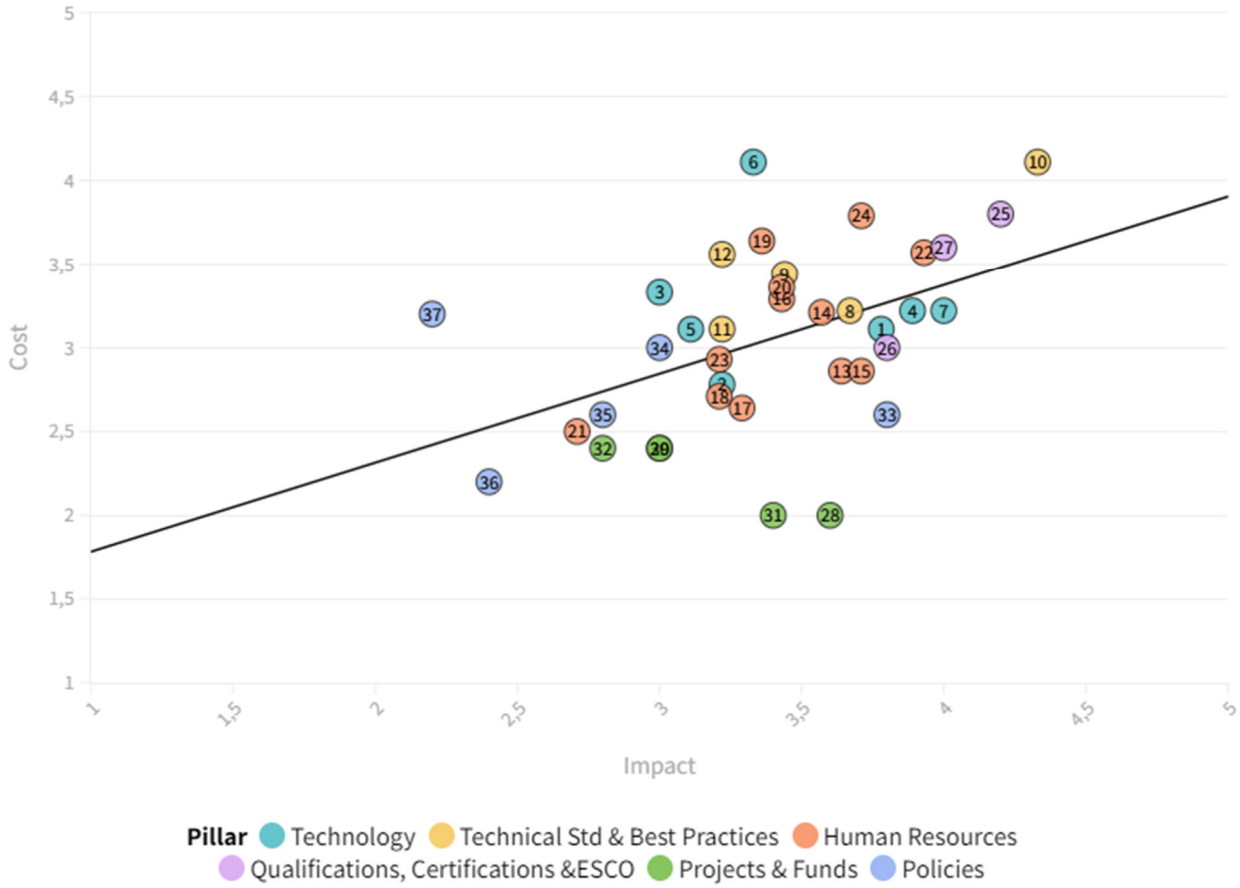


Figure 4 - Interpolation line of the actions in the space Cost and Impact.


Cost
Impact
5
4,5
4
3,5
3
2,5
2
1,5
1
1
1,5
2
2,5
3
3,5
4
4,5
5
Pillar
Technology
Technical Std & Best Practices
Human Resources
Qualifications, Certifications &ESCO
Projects & Funds
Policies

At the end of the workshop, the partners of the ASSETs+ Consortium continued to discuss on the collected feedback in a round table. The discussion focused on the activities to be implemented and the stakeholders, with reference on one hand to the responsible actors or the contributors and on the other hand the target groups. All the insights have been written down on a whiteboard to let partners have a complete overview on the ongoing discussion. The final whiteboard is reported in Figure 5.

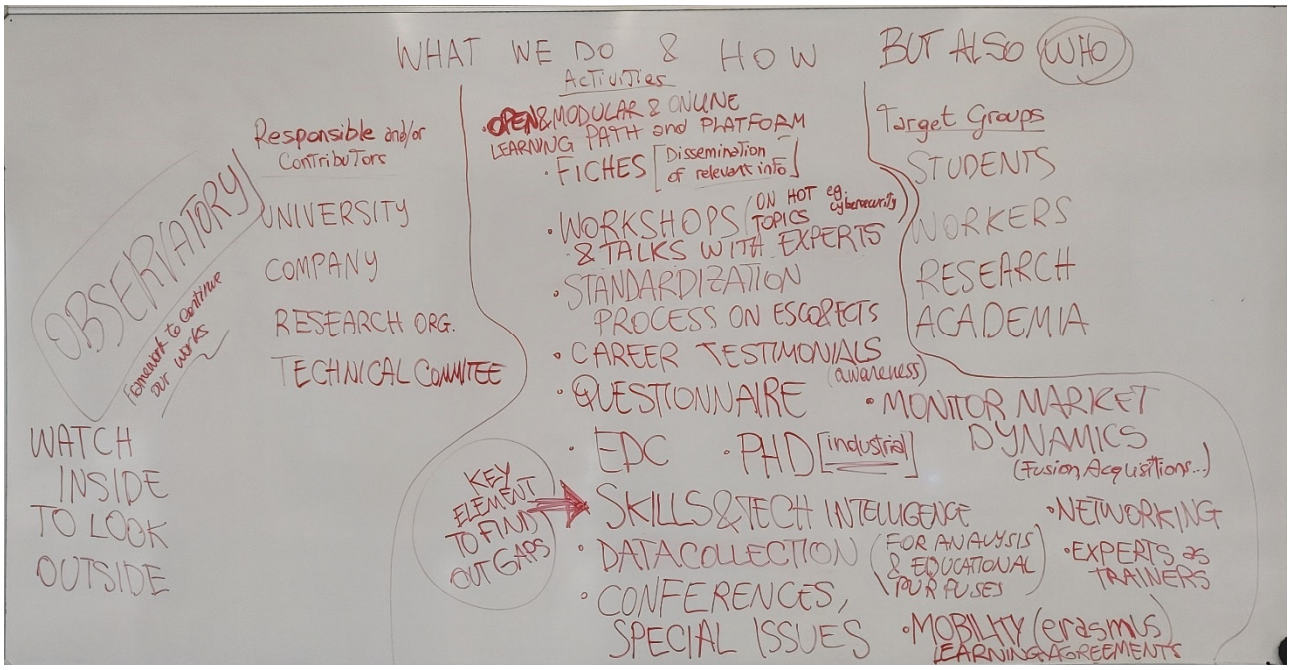


Figure 5 - Whiteboard of discussion among partners.

The key elements resulted from this discussion are the following:

- One of the strength and distinctive element of the project is the **skills and technologies intelligence** which should be continued in the future.
- A good initiative developed in the context of ASSETs+ is the **European Defence Challenge**, arrived at the third edition. This was not planned in the initial plan of the project, but resulted to be very valuable, therefore should be continued in the future.
- The **Observatory** is one of the best frameworks to continue the ASSETs+ initiatives. Therefore, it is paramount to "*watch inside to look outside*", in other words understand which partner institutions can contribute to monitor the European Defence sector in close collaboration with external and existing bodies.

Responses to the questionnaire collected during the workshop

Workshop for developing skills and competences in Defence sector

27 risposte

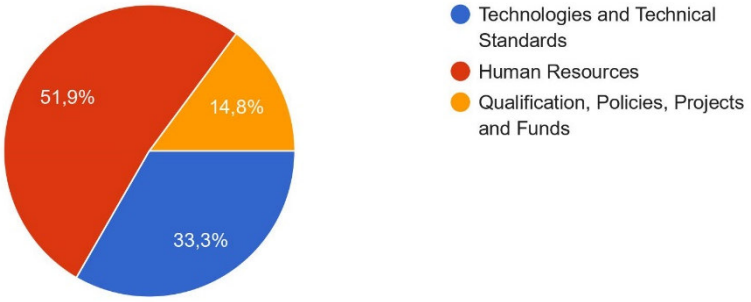
Pubblica i dati di analisi

Your contribution

Please select one pillar to which you would like to contribute most today

Copia

27 risposte

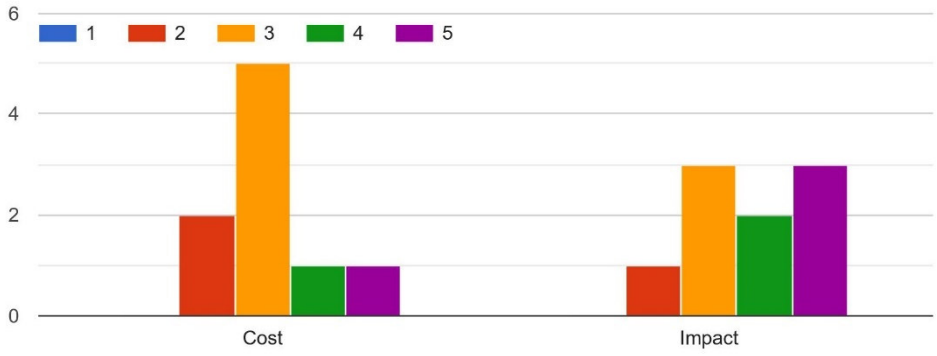


Technologies and Technical Standards

Evaluate the cost and the impact of each actions related assigning a score from 1 to 5, where 1 means low and 5 means high.

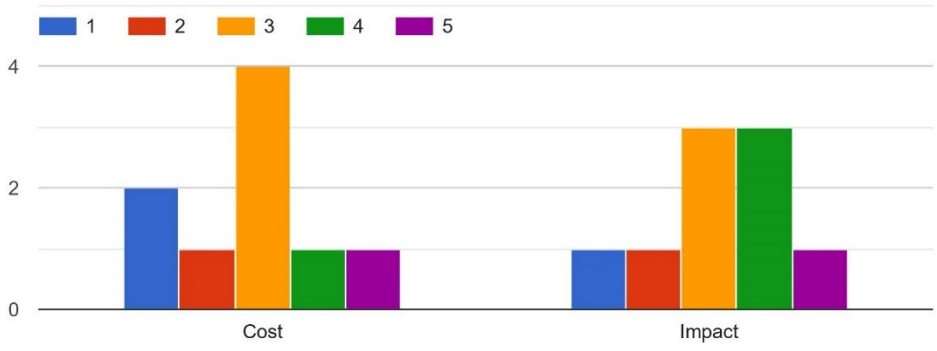
Copia

1. Include in the set-up of a **Defence skills Observatory** experts in new technological advancements who could support monitoring technological developments relevant for the defence sector. Including experts from different technology domains and different EU member states may support having a more comprehensive overview. The observatory needs foresee activities supporting the dissemination of knowledge of new and emerging technologies relevant for defence to key stakeholders from research institutions and industries.



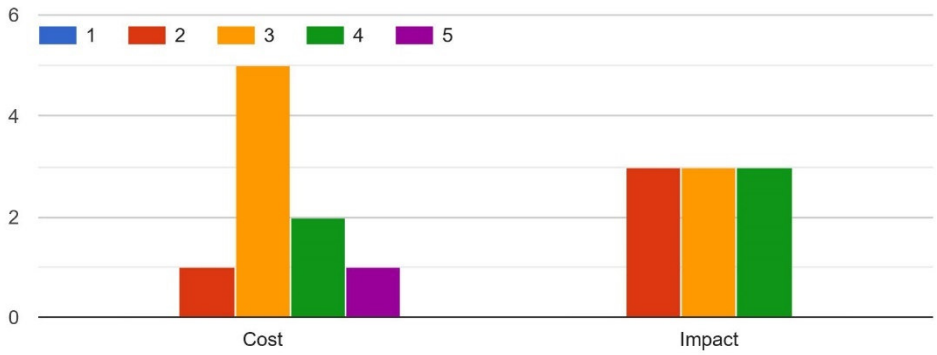
Copia

2. Delineate an **EU industrial "wish list" on key capabilities** to keep the alignment among industrial needs, business models and HR strategies.



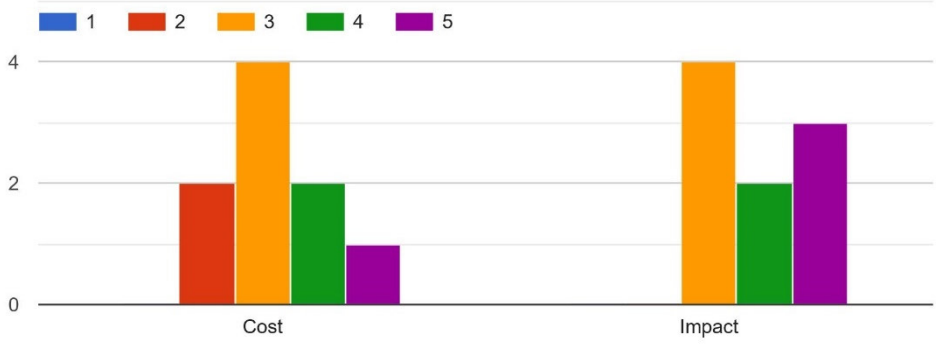
Copia

3. Organize **challenge-based and problem-based initiatives and projects** to attract talent to work in defence industry. Projects based on real problems identified in defence industry can contribute also to developing a common view of the existing issues and agree on emerging skill needs.



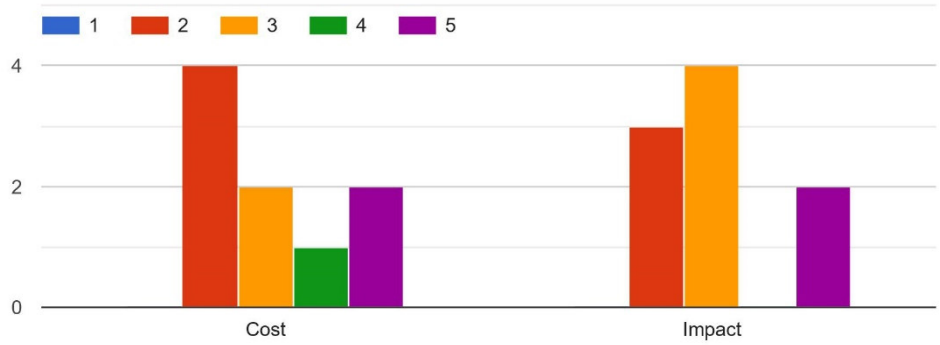
Copia

4. Build **long term partnerships** between industry and education and training providers at both HE and VET level and to facilitate their collaboration at international level. This will facilitate sharing resources (technologies and infrastructures) that on many occasions exist but are underused or underexploited. Such partnerships may lead to cross fertilizations in different technological domains and research areas and help to align better academic research to industrial needs. It is necessary to work on tools that would allow successful partnerships to transform into sustainable long-term collaboration.



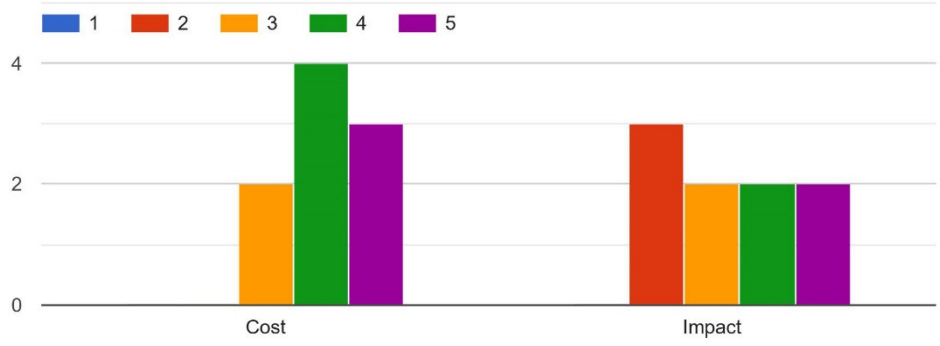
Copia

5. Address **ethical aspects of technological evolution**. The importance of these aspects is growing exponentially due to the nature of emerging technologies such as AI, robotics or autonomous assets. Special emphasis should be put in the education institutions to include these aspects in their educational programs, but also as an important part of the supported projects, challenges and initiatives carried out.



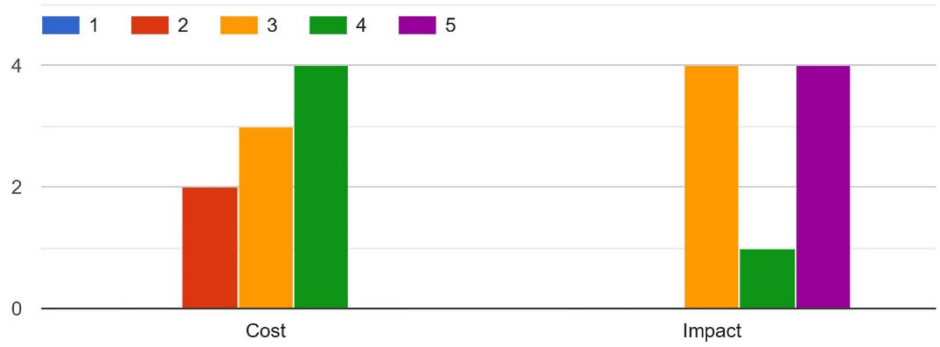
Copia

6. It is paramount to build up a European Defence technologies **supply chain addressing critical technologies**, raw materials and energy resources for EU autonomy and independence. This has already been highlighted in the digital arena, but it has to be implemented for the whole set of dimensions related to the Defence sector.



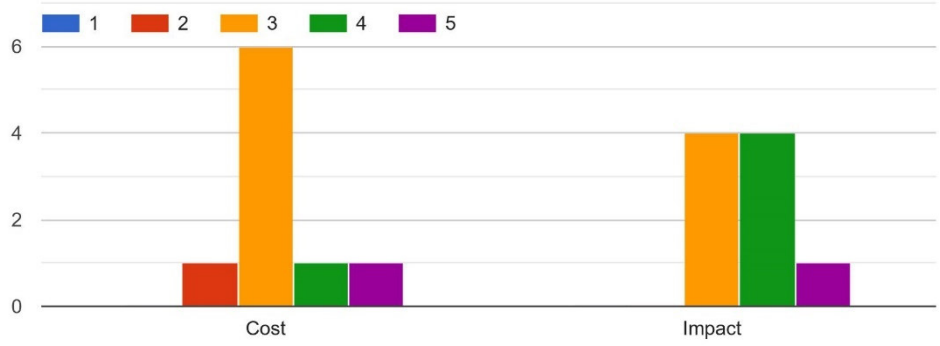
Copia

7. Increase **joint collaboration** between industry, HE and VET providers in developing and providing courses and educational activities on emerging technologies. This would facilitate **mutual understanding** about the training offers from educators and the training needs and training requirements from the Defence sector. This may enable interdisciplinary activities to tackle problems that cannot be addressed by each part alone – ethical issues, handling big data in an effective, secure and privacy-preserving way, or understanding the inner workings of Artificial Intelligence techniques, to name a few.



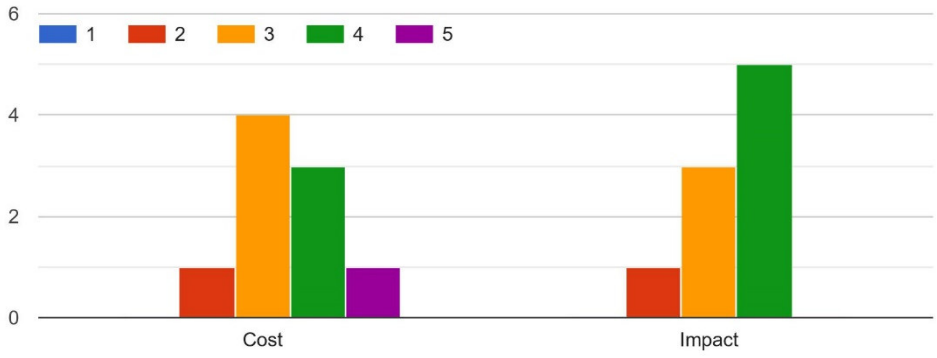
Copia

8. **Facilitate understanding and access** to relevant EU programmes and incentives that support technology related research and skills building incentives and contribute to **harmonizing technology related research programmes and initiatives** across different EU Member States for all administrative stages (regional, national and European levels). These can avoid duplication of investments and efforts, thus enabling a technological development to achieve the European technological **sovereignty** and a reinforcement of the European **identity**. Moreover, it will ensure a common vision for the supply chain for European Defence technologies. These technologies may exhibit some form of **quality** seal to highlight the European nature, as it has been done in other sectors such as cybersecurity.



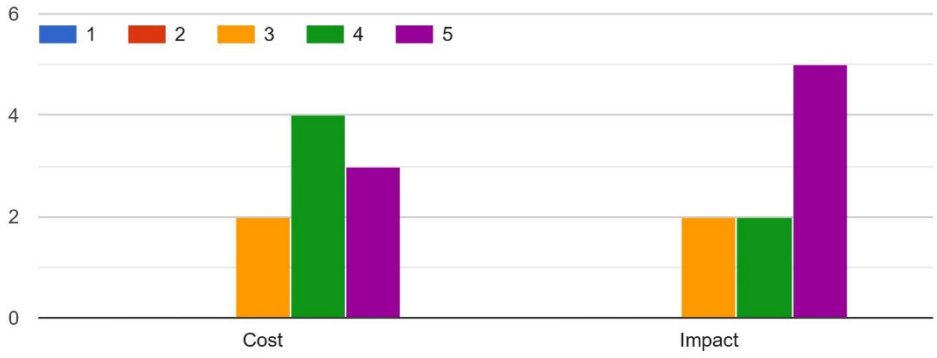
Copia

9. Develop common procedures addressing the issues linked to data access in the defence industry. In line with the European Data Act, the procedures to manage **access to data**, balancing open access and protection of sensitive information in the Defence sector must be further developed. On the other hand, as data may be handled by Artificial Intelligence (AI) techniques, guidance on **ethical aspects** is paramount to ensure proper data collection and handling. These ethical aspects must also be present in the output of AI technologies, ensuring that inferences from the data and decisions made upon or based on automated systems are compliant with existing regulations.



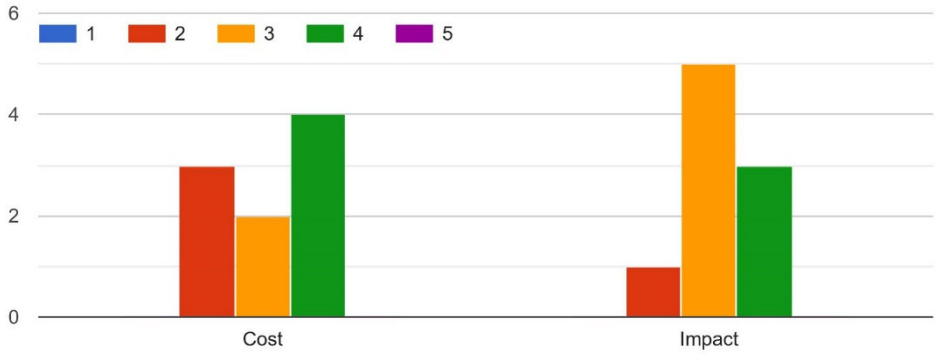
Copia

10. **Develop a certification scheme for AI**. Explainability for AI must also be further developed, especially in the Defence sector. As lives may be at risk and the international security may depend on these systems, the assessment on the proper operation of these technologies is critical. The development of a certification scheme for AI may be inspired by other similar schemes proposed within the European Union, as it is the case of cyber resilience. Standardisation bodies, both at a national and European level, may lead this task upon request of the European Commission.



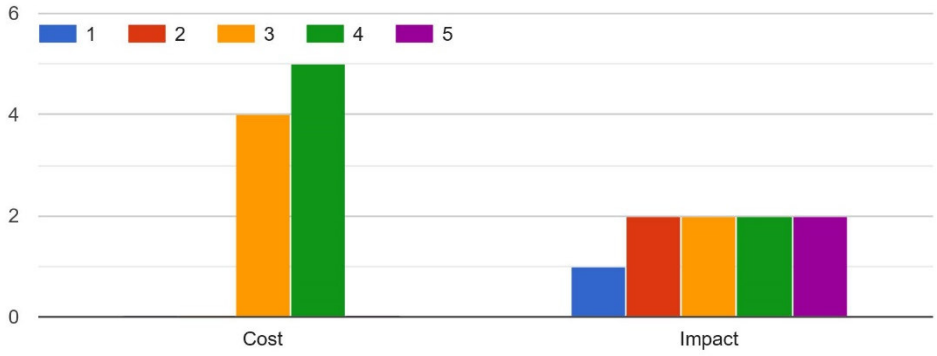
Copia

11. Promote and protect the **exploitation of emerging technologies**. The **protection** of these AI-related technologies must be increased. A framework for **intellectual property** and **licensing** schemes will give investors and technology makers the guarantee for a future return of investment. Furthermore, to **expand the horizon of application** of the developments, the legal and administrative framework for **dual usage** (i.e., applying Defence-related technologies in Civil applications and vice-versa) must be further adapted to the current technological trends.



Copia

12. Develop a **European platform for digital learning** focused on new and emerging technologies. This can enhance **knowledge sharing** among educational providers and researchers across Europe. Moreover, for regular students, the development of a European platform for digital learning may contribute to practising with them leveraging the growing trend of **remote education** (especially after the COVID-19 pandemic) and **virtual augmented environments**. For trainers, researchers and workers in general increasing mobility programmes may help on having a common vision of the state-of-the-art, as well as on promoting multidisciplinary approaches.

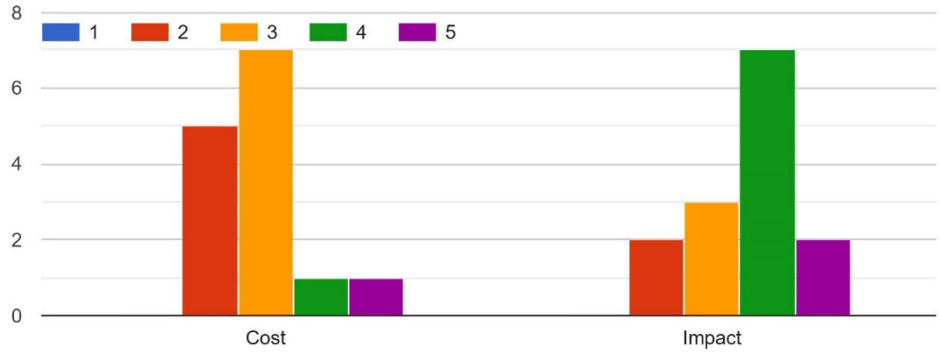


Human Resources

Evaluate the cost and the impact of each actions related assigning a score from 1 to 5, where 1 means low and 5 means high.

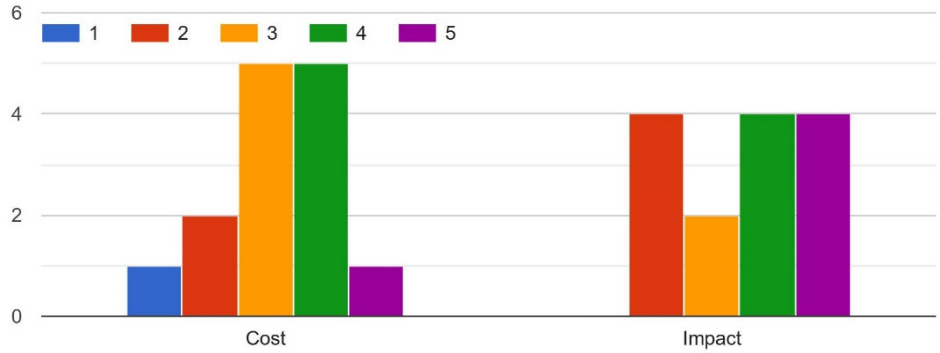
Copia

13. **Map and keep updated skills landscape** for the defence sector and develop quality technology and skills intelligence analysis capturing the need of the labour market. This will lead to delineate **concrete actions** based on data for addressing skills needs and gaps. The skills Observatory for Defence could lead this task



Copia

14. Facilitate collaboration for Defence related initiatives and issues among EU members states. At a European level the **harmonization of Member States' policies** and initiatives related to skills should be encourage and could be a key topic to work on under the EU Observatory umbrella. There is a need to **release information** at different levels, on core Defence related plans, projects, resources and funds for up-skilling and re-skilling and the EU Observatory could help the dissemination process.

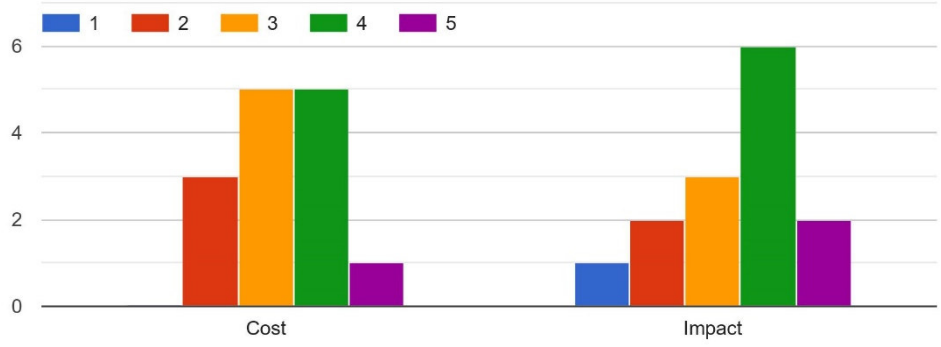


Copia

15. **Support attracting young talents** to work in Defence industry by increasing the **awareness about careers** in the Defence area and providing more information about the possible careers paths. The companies in Defence area should motivate both new workers and current workforce in constantly **develop and improve their skills**. Therefore, more information about up/re-skilling program should be provided to explain clearly how they can growth in this area.

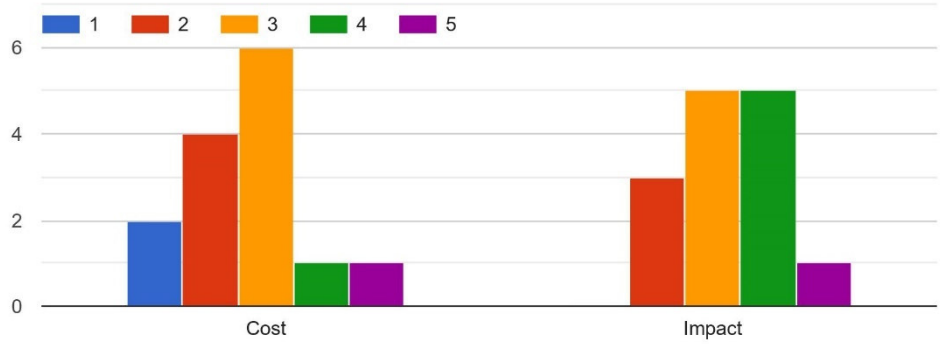
Copia

16. Develop a tailored training offer in the form of short modules addressing the upskilling and reskilling needs of the defence industry in close collaboration with the industry. An important element to consider is also to ensure alignment with industry needs regarding emerging topics by proposing an **educational offer** that will meet labor market needs. Programs for workers should consider rather **short and modular formats**, considering the need for **flexibility** and the possibility of addressing **multiple skills** common within several careers. In addition, the educational offer must include a **certification** process to justify the skills acquired at national and European level.



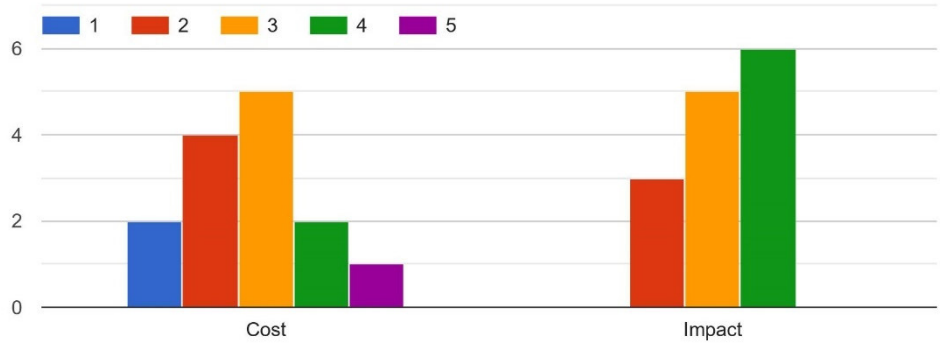
Copia

17. **Mapping the educational and training offer** to Identify and promote already existing training offer focusing on up-skilling and reskilling the current workforce. Increase awareness and expertise in skills on the digital aspects through **promotion and funding masters and post graduate courses** in this field.



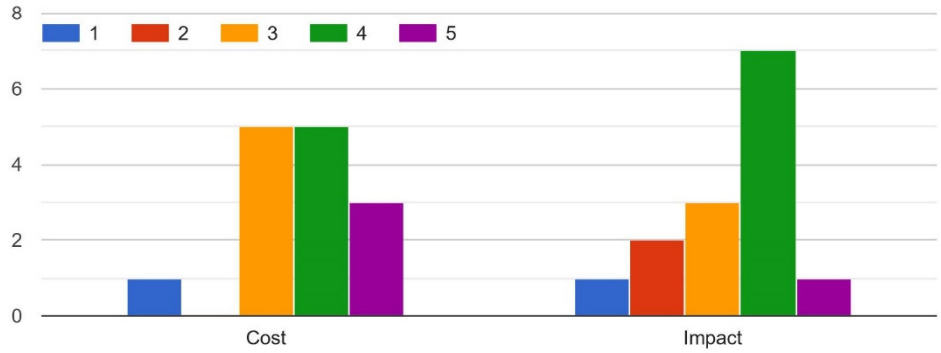
Copia

18. Promote Including the **emerging topics** in education systems through various means such as lectures, internship, degree programs but also PhD programs.



Copia

19. Promote **mobility** for students and teachers leveraging on Erasmus+ programs and EU research projects. Additional elements such as solid **cross fertilizations** in different technological domains and research area but also the consolidation of a strong **network** of educational institutions and companies should contribute to create synergies between educational and industry and create a sustainable HR supply chain. Interesting approaches such as the **exchange** of trainers and teachers to provide technical and theoretical expertise in courses combined to collaborations between specialist from industry and academia in design of education programs, will ensure the alignment with current and future industrials needs.



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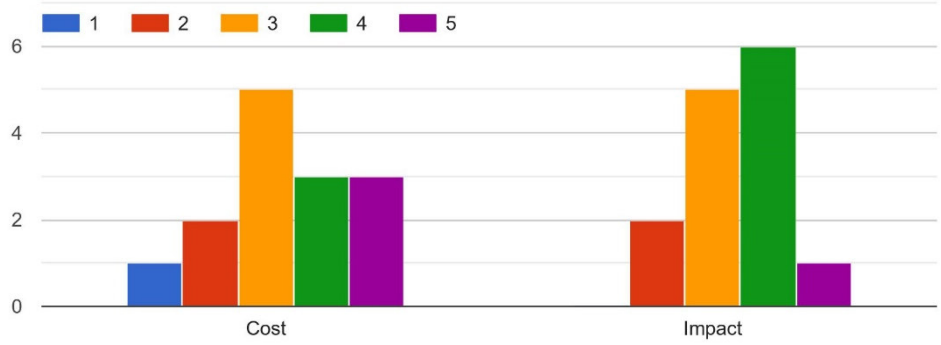
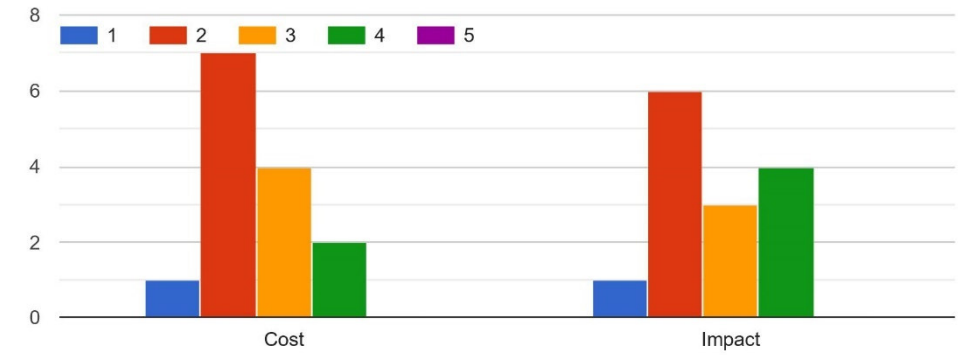
20. **Encourage Research & Development activities in cross-cooperation** between universities and research laboratories and R&D departments of companies.



Copia

21. Implement **awareness** raising activities on the social and economic impacts of educational and research in the development of society at different levels (regional, national and European) towards technological autonomy and sovereignty.



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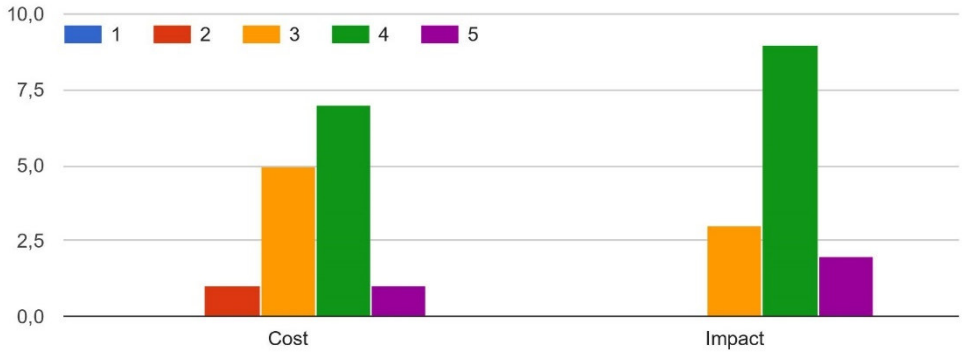
22. Design **courses** aligned with technological evolution and industrial needs to fulfil **skills gaps** with reference to Data and AI literacy, cybersecurity procedures and soft skills.



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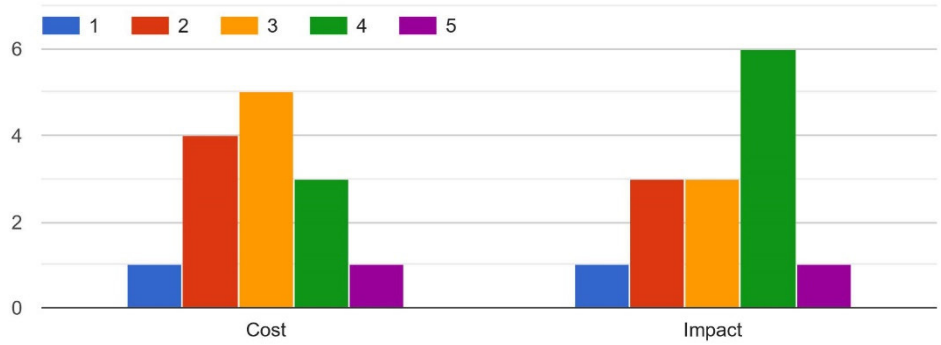
23. Define **collaboration protocols** for resources sharing among organizations, promoting a network of stakeholders and fostering the implementation of activities combining **work based and classroom** education, such as apprenticeship, internship, industrial PhD.



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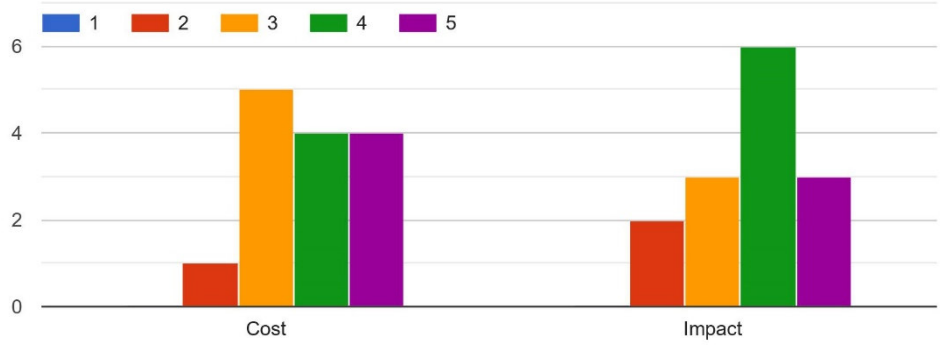
24. Promote **digitalisation of infrastructures** combining laboratories and class with virtual augmented environments and improve **teachers' capabilities** by:

• encouraging peer exchanges between institutions to support upscaling of good practices
• providing short course to upgrade competences, not only related to school subjects, but also to technological tools for education and pedagogical approaches
• trainers visit to industrial and research centres promoting exchange practices
• promote exchanges of teachers and trainers from industry and academia



Evaluate the cost and the impact of each actions related assigning a score from 1 to 5, where 1 means low and 5 means high.

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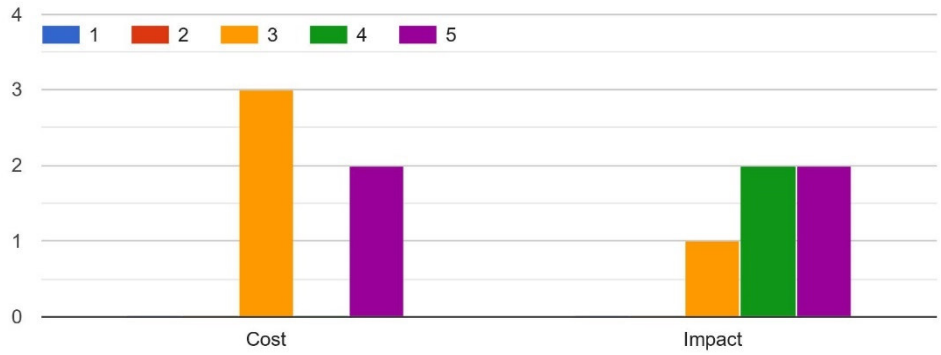
25. Set up **transnational digital framework** involving universities and learning centres across different EU Member States. A virtual educational environment can promote interdisciplinary teams and international collaboration and encourage students' mobility.



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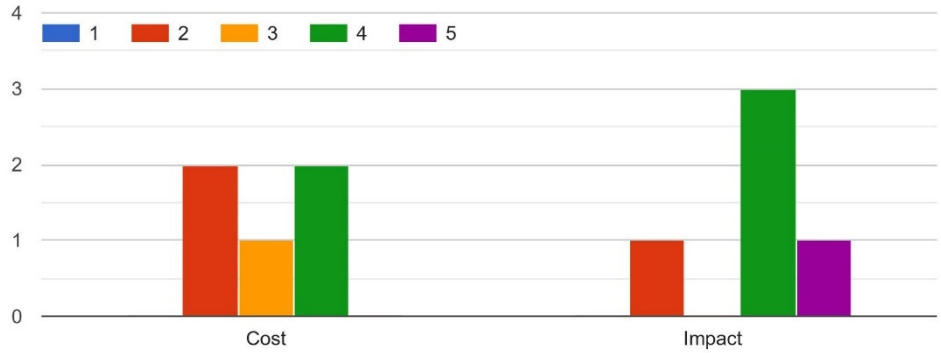
26. Set up a **modular education and training program** to develop a sustainable Human Resources supply chain, including short courses from basics to highly specialized courses dedicated to advanced technologies. In addition, promote **engaging pedagogical approaches**, such as challenge-based learning, competitions, gamification, problem-based learning, project-based learning, supported by industrial cases.



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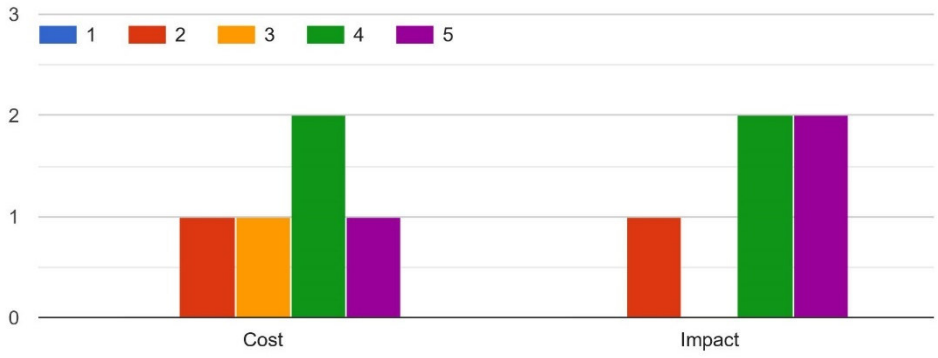
27. Design the **defence qualifications,** update programs and future forecast trends based on defence industry needs leveraging on data science, data mining and skills intelligence techniques. This should include the definition of **access requirements** and implement different educational paths for qualifications such as Initial education and training (entrance level students), Continuous education and training (workers), **Recognition of Prior Learning (RPL)**, Reskilling, Upskilling (workers). Then, it will be paramount a **quality assurance system** to implement qualifications, including rules and procedures for system requirements and roles; authorized training centres for compliance with quality level requirements, both facilities, equipment, and personnel; and independent third parties to monitor and assure quality assurance. Finally, it is necessary to set up a **harmonised assessment approach**.



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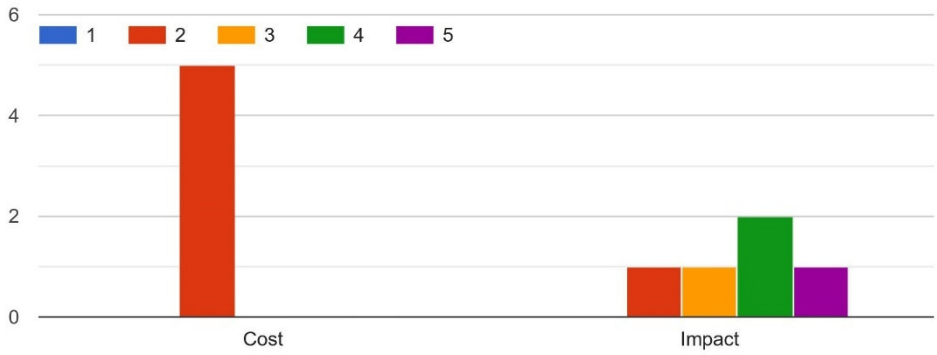
28. Identify and promote EU funding opportunities for **joint collaborations** between different organizations (companies and educational providers), different industries and EU Member States. All above mentioned can leverage on already existing **collaborative funding programmes and stakeholders' networks**. In this sense, a **harmonized regulations** for exchanging resources between Defence companies is paramount for developing shared vision for future European research projects.



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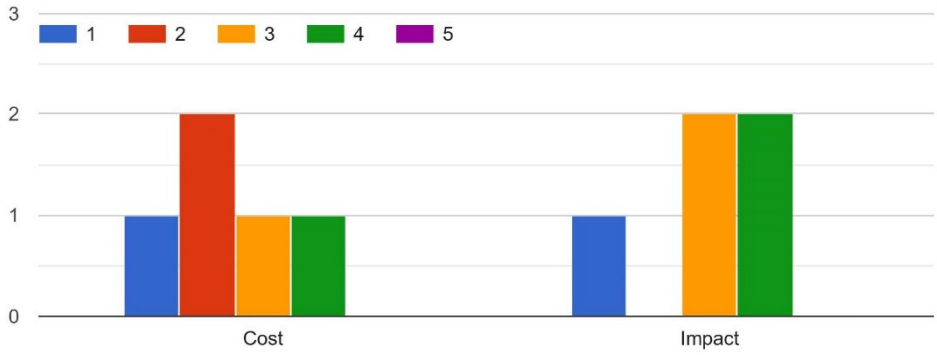
29. Promote **life-long-learning culture** in the workplace in Defence industry, through educational and training programmes, and foster mobility programmes for students and workers.



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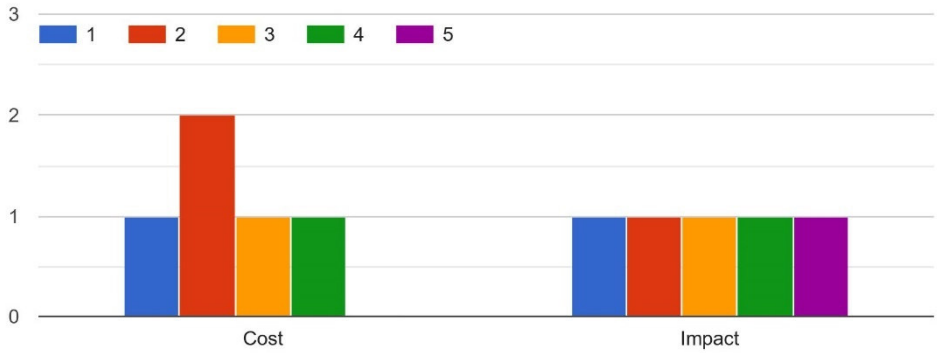
30. Work to improve the **attractiveness** of the Defence sector by promoting up-skilling and re-skilling programmes for career development and dissemination about programmes and funds for emerging technologies and skills.



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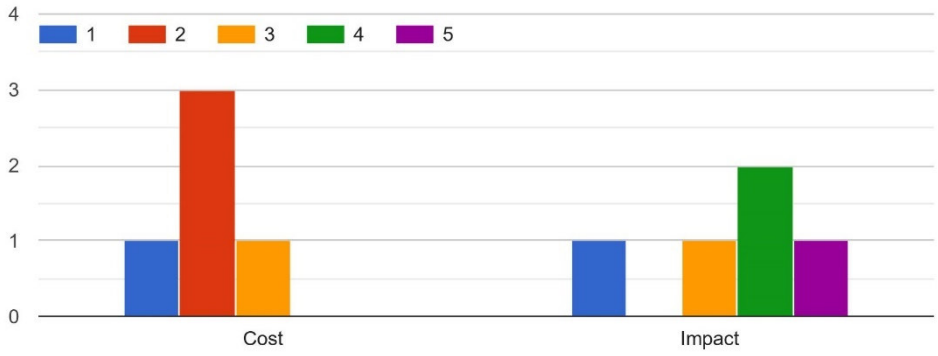
31. Increase **awareness** among students through **challenges** and **competitions** on emerging technologies, such as the ASSETs+ European Defence Challenge, to attract young talent to the Defence industry and to encourage them to initiate a career in defence-related technologies.



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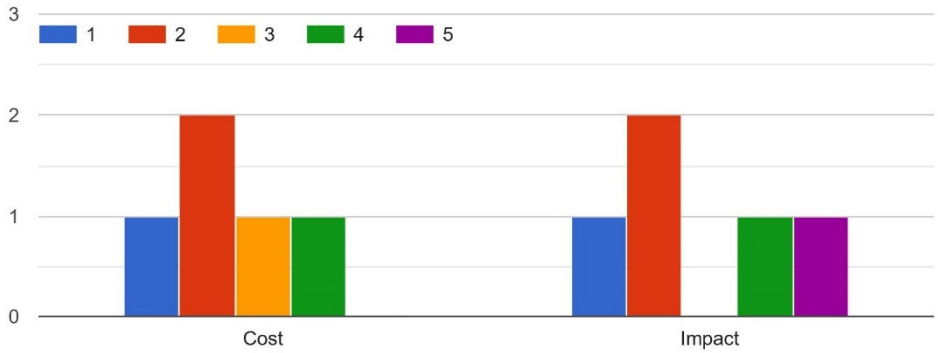
32. Communicate with transparency and fight against **fake news and misleading information** in social media. Ensure ethical, human-centred AI, consistent with the European values. Support projects related to **data protection**.



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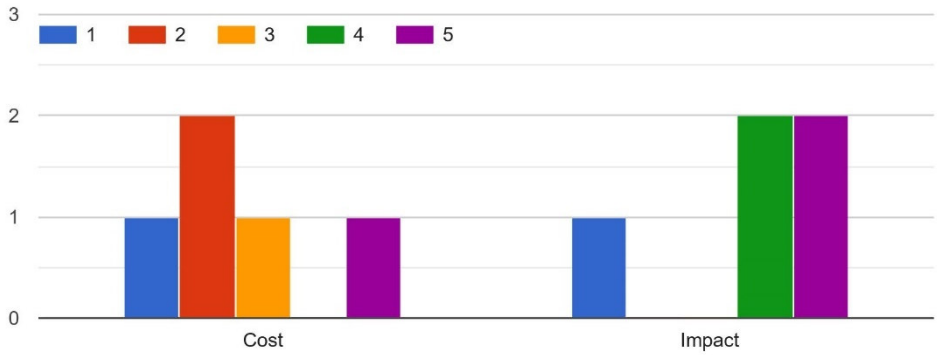
33. Develop a **qualification** system for the emerging technologies that can support the European Defence by leveraging on existing networks involving educational institutions and industry such as the ASSETs+ Consortium, built on close collaboration between Defence Industry, Sectoral Organisations, Higher Education Institutions, Vocational Educational & Training providers and Research Centres to ensure a sustainable Human Resources supply chain, and developing a network of European innovation centres and hubs. **Educational programmes should focus on emerging technologies** both for next generations and current workers, therefore it is fundamental to promote the use of **foresight techniques** to develop policies and programmes on the core skills and technologies for Defence.



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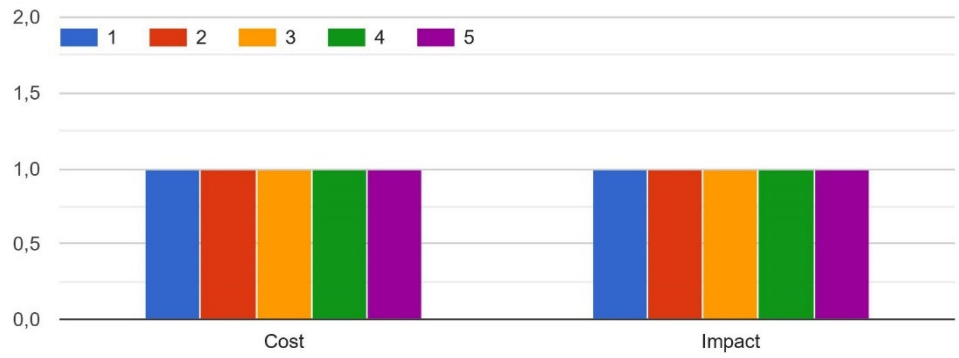
34. Set up a **framework for cross-fertilisation of research and innovation** between the civil and defence sector, to stimulate synergies, to avoid the risk of duplication and to boost innovation. There is already an action plan https://ec.europa.eu/commission/presscorner/detail/en/QANDA_21_652



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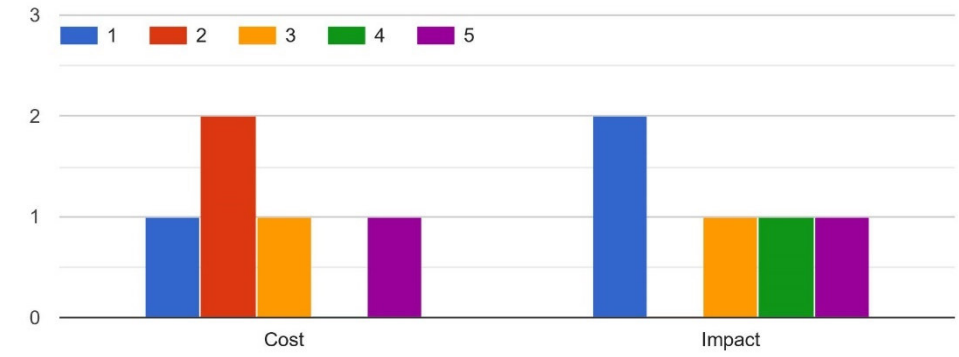
35. Improve **communication policies** to promote the Defence sector, and to explode the myths and biases around it, based on transparency and confidence-building measures.



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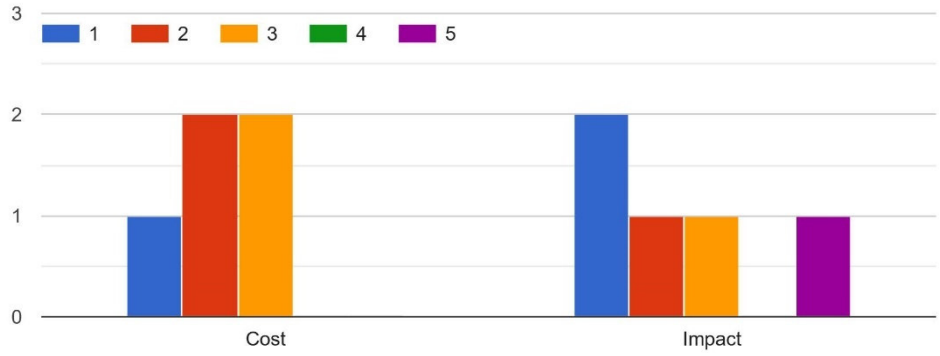
36. Develop and implement policies to ensure **diversity** in Defence sector.



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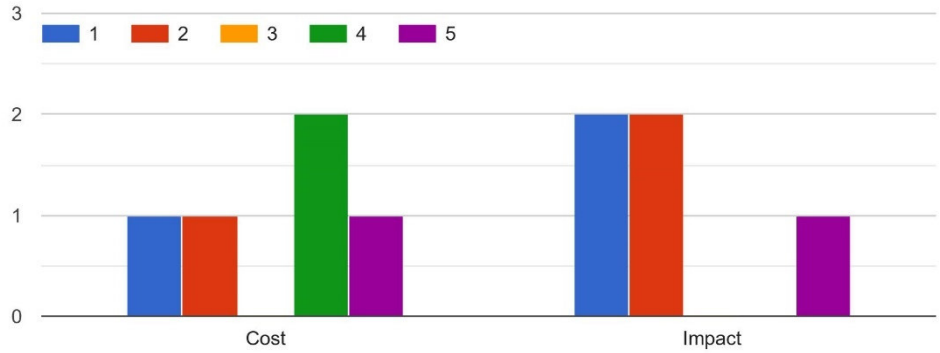
37. Develop and implement EU guidelines for trustworthy **artificial intelligence, data protection and confidentiality**.



Additional Feedback

Please, if you want, leave us additional feedback to improve the strategy

9 risposte

Answers retrieved through internal consultation to ICT area

retraining and training systems can also work in challenging educational systems if we can recognize the specifics of each. Not everyone can do everything well. This means that first a cognitive profiling of operators and employees and then a structuring of active and flexible training processes should be carried out. In a rapidly changing world, the key competence is not to learn a certain thing at a certain time, but to be able to reprogramme quickly to new needs. This is adaptive learning, a physiological characteristic of living beings. Changing quickly to respond to the adaptive demands of the surrounding system.

Answers retrieved from internal consultation to our HR-Training area

Q36. has been demonstrated by Yoon et AL that gdpr and other policies are a blocking element with respect to the innovation process expecially for AI and maybe also cyber

Answers retrieved from internal consultation (EU Representative and HR)

Make on these subjects a short "State of the Art" used by each partner company (AI , Cyber Security, eLearning platform ...)

Increase the reach of Assets+ dissemination in order to gather more associated stakeholders

Impact and cost might be considered different depending on who answers, Uni, Industry...

It is important to have an analysis on "cost-effective" measures. If cost<impact, then I would read it as beneficial.

I found some questions overlapping, e.g., 4 and 7 on the cross cooperation between industry and academia and afterwards addressing the creation of teaching/training initiatives. The first is a superset of the second.

I believe involving national governments should not be left aside. Defence is a very sensitive area so major issues may appear if governmental/political issues are not correctly addressed. Alignment with national priorities in terms of Defence cannot be overlooked.

Beyond cooperation between industry and academia, I believe that having staff mobility between both worlds is a key issue. Otherwise, it will be very hard to achieve mutual understanding. However, again, it needs a lot of political/administrative issues to be sorted out beforehand.

Thank you very much for your contribution!