ASTRAIOS

TOWARDS A SKILLED EUROPE FOR SPACE INNOVATION

Analysis of Skills, Training, Research and Innovation Opportunities in Space

D2.3	SPACE SECTOR SOFT SKILLS

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Abstract

This analytical document brings together the responses of recruitment professionals, as well as their recommendations supporting the desire of companies to better understand their employees and offer them opportunities to improve and thus improve their impact in the company. This reflects an informed decision by the organizations and therefore contributes to the evolution of their success in the market. The discussions encompass recruitment, retention, soft skills, and communication dynamics, collectively underlining the evolving landscape of work in virtual and hybrid environments. The soft skills gaps are recognized as a missing part of academic curriculum what absolutely must be changed starting even from the early age, primary and secondary education. The analysis of the responses reveals the importance of communication as a key factor in a multitude of facets which allows individual to intervene in the resolution of problems, lead negotiations and manage teams obviously in combination with the other skills such as team spirit, professional curiosity, etc. The communication is the most rewarding skill and makes it possible to impact the success of the individuals professional career. The digital fluency is the new skill which was target as one which must stand under the soft skills umbrella.

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1. INTRODUCTION

As part of the work of the ASTRAIOS project a specific task is linked to the Space Sector Soft Skills. The International Space University (ISU) is leading this task, and together with consortium members (SSA from the UK in particular), did analysis how soft skills are needed by the space sector trying to gather best practices. This deliverable presents an analysis of feedback survey collected from workshop participants and combined with conclusions came directly from interactive discussion during the workshop which was held on the 27th of November 2023.

For long, the traditional approach to skills acquisition has been based on the "linear" assumption – that most people go through the education system, enter into a job for life and finally retire. That assumption is being strongly challenged by an increasingly evolving labour market which requires workers to engage in a continuing skills acquisition process involving numerous transitions to different occupations and skills-sets. Furthermore, it was for long being considered that in the space sector only technical skills matters, however we see now that soft skills are increasingly being important due to the intrinsic characteristics of the space sector (e.g. interdisciplinarity, international, intercultural, innovation-driven).

ISU organized an online workshop in the form of a dedicated focus group on an invitation-only basis. The workshop had a great response, but the participants were selected primarily by targeted recruitment positions in space companies, such as in particular of Human Resources/Talent Management functions. In order to be able to ensure the diversity in the workshop participants the participants were selected from different segments of the space sector such as space industry, agencies, specialised recruitment firms, academia, private companies, and start-ups. Participants attending the workshop came from following companies: HESpace, ESRIC, ESA, LSA, Leanspace, Maana Electric, Airbus, D-Orbit, Thales Alenia, and OHB.

The workshop objectives were to cover recruitment, retention, skills needs and gaps, and training provision. Themes and questions were co-designed by ISU and Space Skills Alliance with the goal of collecting actionable data about the skills issues within the European space industry and addressing key challenges and identifying potential gaps.

2. SOFT SKILLS IN SPACE SECTOR

In the space sector, soft skills are as important as hard skills. Many abilities are required depending on job positions.

Soft Skills have a significant impact in the world of work and play a predominant role. There is believe that their qualities are necessary in building a solid professional career to achieve success, particularly in specific sectors.

It is therefore recommended to develop them through regular implementation and evaluation of behaviour and means of communication in order to improve the quality of team and individual achievements in company. Soft Skills are difficult to be measured in short term (specifically in early career stage) because they are less tangible compared to technical skills, however, their impacts are significant on professional careers and success within organizations. Success within a team or department is often increased by creating people with important Soft Skills.

There are no differences in space sector when we talk about soft skills. They are placed under "competencies" umbrella together with traits, knowledge, qualifications, technical, and transferable skills.

In Fig. 1 was shown research analysis results on early career space jobs adverts (study of over 800 space adverts in the UK) and on the top competencies 'Soft' skills are in very high demand together with transferable skills.

There are differences between different types of skills, such as technical and interpersonal.

Interpersonal skills are often factors that make stand out in the workplace. These include mainly leadership, problem solving, communications, and adaptability which can generate many opportunities in the job market. These are developed through different processes such as training or personal growth which respectively will act on the skills. Despite the knowledge provided by training in real life allows candidates to ensure that our abilities allow us to stand out from others.

One of the most appreciated skills remains _communication_ which plays an essential role in success Progression requires regular exercises, thus offering improvement throughout the stages. A _good analy_sis of the situation and _clear thinking_ allows to determine the right behaviour to adopt and therefore use Soft Skills to overcome a problem encountered. The person must combine their work with their skills and refine their communications channels to correspond to the stakeholders and team during their discussions.

Adaptability is a key factor in the evolution of the space environment to remain in line with regular technological progress. It is therefore essential to continue training in new working methods so as not to affect the professional success factor.

Resilience is a valuable quality. The space sector includes many challenges and challenges based on great uncertainty. It is therefore important to have the ability to overcome obstacles, learn from failures and continue to overcome present difficulties.

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Attention to detail is necessary in specific sectors. Precision and care in carrying out missions is essential. The smallest error can lead to mission failure and therefore disastrous results in space. It is therefore essential.
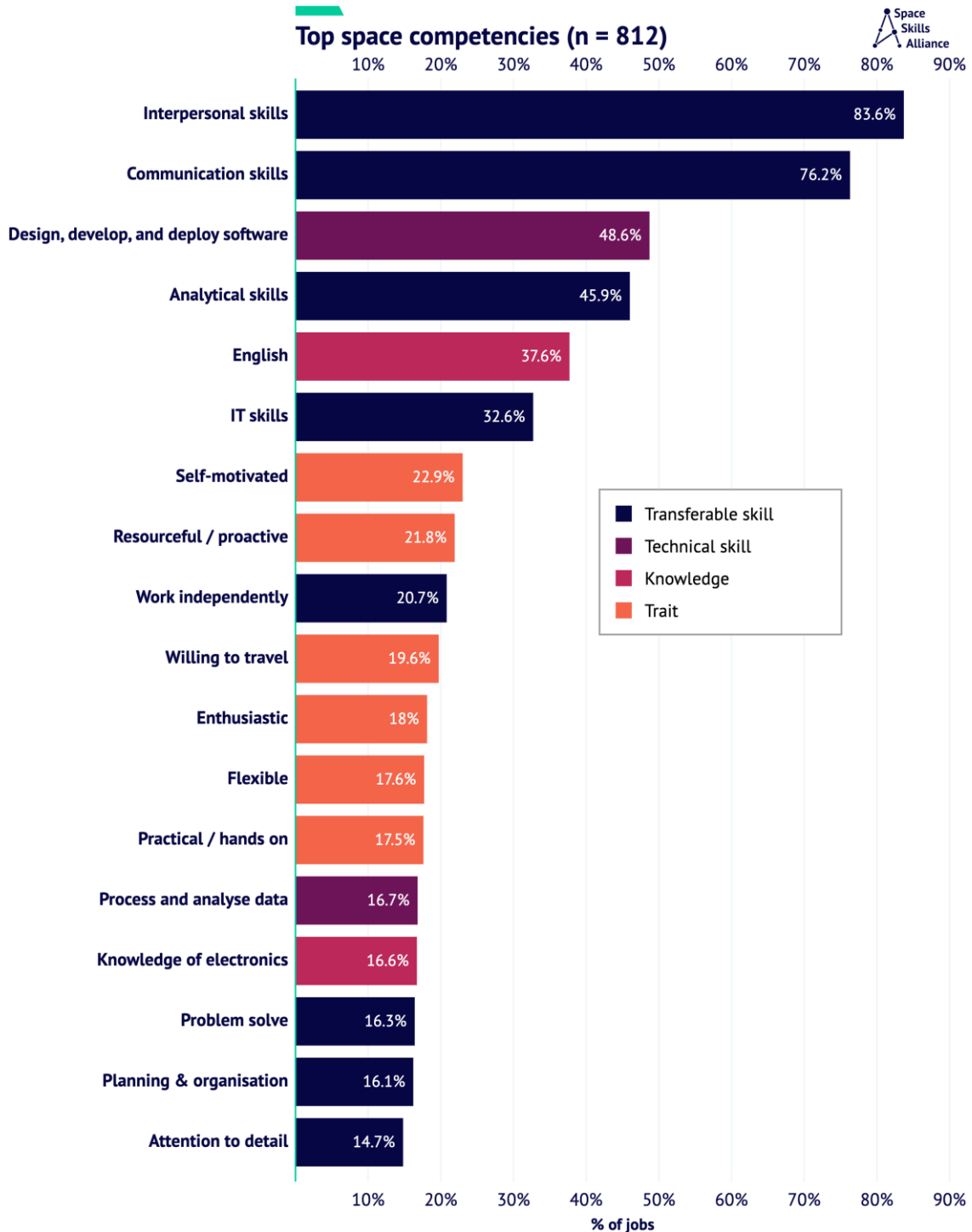

Figure 1: Top space competencies demand for all jobs [1]

Time management is an inevitable skill for the deadlines associated with milestones and achievements of space mission's objectives. *Leadership* is also part of the top list of required skills. The ability to manage people, control and organise projects, and make decisions requires constant leadership. Good leadership target the good performance of a team's work and good success of company.

In specific sectors such as space, interdisciplinary teams are usual in view of the complexity of missions often reduced thanks to good collaboration in order to achieve a common objective. *Problem solving* is also one of the most sought-after skills for professionals in the space sector. Indeed, their role is to identify difficulties quickly and remedy them with creative and realistic solutions in order to maintain good cohesion at work.

In order to keep soft skills on high level, to gain missing soft skills, and to perfect them, occasional training must be planified through the employee's career. The main objective of the training is to establish a framework and scenario planning to evaluate Soft Skills and determine their impact on individual and team achievements. In addition to this, interaction, exchange experiences, work on diverse missions or project represents an opportunity or challenge to put workforce Soft Skills into practice and consider them as a habit to adopt.

Recent research analysis in UK, September 2023[2], on space sector skills showed that existing skills gaps issue expecting productivity, quality, and expansion of companies. Spotted gaps are highly presented in:

- 38% of the **workforce** (software, data skills, AI and machine learning, etc.),

- **recruitment** (52% of job applicants skills gaps in job applicants, some challenging engineering positions to recruit (such as electronics, system engineering, and spacecrafts operations), senior positions are also hard to fill it due to lack of experienced professionals, and hire time to recruit is too long (median is 10 weeks for average role),

- **retention** (hard to retaining space staff for a long term due to poaching by space competitors, low salaries and increase the workloads).

According to results from "Space Sector Skills Survey 2023" [2], in the next two years, the UK Space Agency is ready to invest £15 million in education, workforce programmes, and outreach to reduce important targeted skills gaps and to establish skilled and sustainable workforce.

The ESCO (European Skills, Competences, Qualifications and Occupations) dictionary is part of the Europe 2020 strategy. The ESCO classification identifies and categorises skills, competences, qualifications, and occupations relevant for the EU labour market and education and training. The ESCO skills pillar distinguishes between skills and transversal skills and competences. https://esco.ec.europa.eu/en

3. METHODOLOGY AND RESULTS

3.1 Methodology

In a concept of continuous evolution in the professional environment, the place of Soft Skills tends to gain importance. It is referred to as one of the success factors of organizations.

The objective of our analysis is to define the gaps in soft skills in the space sector, mainly how to identify them, how to gain and maintain them, and how to understand their impact on organizational performance and on the results they generate.

The survey and workshop were run with same participants analysing and commenting the outcome from questionnaire. During the workshop discussion, the aim was to identify soft skills gaps in the current space workforce and how to implement soft skills in the future workforce. The discussion was built on survey data provided by participants in advance.

Questionnaire (Appendix A) was created according to the ESCO classification and "Space Sector Skills Survey 2023 Report". The Soft skills themes covered in the workshop are linked to:

- Technology/digital fluency
- Communication (Interest in the conversation, Articulation of language (tone of voice, eye contact) etc.
- Business acumen
- Diversity and cultural awareness
- Customer service
- Negotiation
- Solutions mindset
- Prioritizing and organization of work
- Conflict resolution.

3.1.1. Objectives

Following objectives intend to comprehensively explore critical facets related to soft skills within the space sector:

Soft Skills Source and Development Mechanisms:

- Ascertain the primary origins of soft skills for current employees.
- Evaluate the effectiveness of existing organizational approaches for training and supporting soft skills development.
- Identify prevalent mechanisms for the acquisition and enhancement of soft skills among current employees.

Soft Skills Pipeline Challenges and Solutions:

- Investigate challenges within the soft skills pipeline in the space sector.

– Determine the root causes of issues, from academia, companies, or a lack of sector body support.
– Suggest changes and remedies to overcome the identified challenges.

Impact of Soft Skills on Organization and Training Adjustments:

– Assess the repercussions of inadequate or excessive soft skills on organizational performance.
– Evaluate the efficacy of ongoing academic training in cultivating soft skills.
– Specify soft skills deemed essential at distinct career stages, beginning or post-secondary education.

Degree Relevance and Soft Skills Levels:

– Explore the significance of specific degrees (Bachelor, Masters, PhD) in prospective hires.
– Examine potential variations in soft skills levels among graduates with different degrees.

Recruitment Approach and Soft Skills Targeting:

– Evaluate the current recruitment strategy concerning career stages (early, mid, or late).
– Determine the career stage most likely to harbor individuals with requisite soft skills.

Prioritization of Soft Skills in Candidate Selection:

– Rank the importance of essential soft skills during candidate selection.
– Assess the relevance of skills such as technology/digital fluency, communication, business acumen, diversity and cultural awareness, customer service, negotiation, solutions mindset, prioritization and organization of work, and conflict resolution.

Future Essential Soft Skills and Organizational Contributions:

– Identify anticipated essential soft skills or areas of expertise for the future.
– Propose additional measures for the company to ensure future soft skills requirements are met.

Soft Skills Focus and Organizational Impact:

– Evaluate the necessity to emphasize soft skills.
– Determine potential alterations to the business or operating model.
– Assess the requirement for revising job descriptions and adopting new hiring practices.

Remote Working Effects on Recruitment and Retention:

– Scrutinize the impact of remote work on recruitment and retention.
– Identify shifts in international competition and expectations of potential hires.
– Determine the expected influence of remote work on future soft skills needs and associated timelines.

3.2 Results

Results were based on combination of survey data collected in advance and conclusions driven during the workshop interactive discussion. From presented cross matched survey outcomes (see Appendix B) each participant commented personal experience as HR/Talent manager during recruitment procedure from soft skills point of view.

Question 1:
Where have the people currently working in your organization gained their soft skills? (e.g. at university, on the job, in other jobs/sectors)
How does your organization train or support employee training in soft skills? **For your current employees, what are the primary mechanisms they have acquired and developed soft skills?**
Observation
The majority of soft skills were developed on previous or present jobs and during the external training and studies. They also come from personal combination of natural inclination, parental upbringing, and social influences. Depending on the size of the company and the length of its existence there are different approaches to training on soft skills. Some of them are organizing in-house training in a wide range of topics, organized several times per year, including as well individual and team coaching on efficient habits provided as a short training 15 minutes ones a week. In some companies for this purpose there is a trending budget dedicate. Some training is mandatory to attend, depending on the position in the company (e.g. leadership training is mandatory for all managers). The primary mechanisms which current employees have developed their skills on the job, learning by mistakes or by senior manager who puts the effort to have all rounded employee.
Key elements
This examination underscores a recurring emphasis on on-the-job learning, training opportunities, and the paramount importance of soft skills within the organizational context. **Soft Skills Development:** through practical on- job experience and previous education. **Training Opportunities:** the importance of on-the-job learning trainings, online e-learning platforms for skill enhancement and highlight the provision of varied training types, collaborative efforts with colleagues and line managers as integral components of on-the-job learning, emphasizing that soft skills evolve through practical experiences, learning from errors, and guidance from senior managers.

Question 2:
The space sector faces difficulties finding employees with the expected soft skills. Where do you think the issues are coming from in the soft skills pipeline? (e.g. Academia, individual companies, a lack of support from sector bodies). What needs to change?
Observation

The issues come from that sector is focused mainly on acquisition of technical skills. Soft skills in majority cases are asked during the interview when person is applying for a new job but in some cases, they don't have priority. Individual's performance is measured in means of delivering a technical result (e.g. project review) so soft skills are rarely measured.

From University point of view, soft skills are not included in curricula while technical skills are taking almost all portion in learning programs.

Some suggestions drove that soft skills might be introduced earlier already at secondary schools when people are growing and developing their life skills.

Key elements

Those main point shared concerns about the undervaluation of soft skills in education and recruitment, with a joint call for an increased emphasis on these skills in both contexts.

Neglect of Soft Skills: Highlight that soft skills are frequently disregarded during job interviews and within the education system.

Focus on Technical Skills: Point out that the sector and hiring managers give priority to technical skills over soft skills, resulting in an imbalance.

Recruitment Practices: The soft skills are infrequently considered during job interviews, urging a reassessment of recruitment criteria.

Limited Soft Skills Education: The insufficient emphasis on soft skills education at universities.

Question 3:

The How does having exceeding or insufficient soft skills impact your organisation, relative to the expectation of the job? Is current academic training working well? If not, what should be changed?

Which soft skills should be acquired at which career stage? Starting from post-secondary school (into university/college).

Observation

In smaller companies the impact of lack of skills is larger compared to bigger companies. Soft skills have an enormous impact on person career. Technical person must know how to share knowledge and work in a cooperative way with other people.

Opinions on age when to start with training on soft skills are divided. Some participants are for early introductions at secondary school level while other are strictly keep this for university level. In any case it doesn't matter as long as they are able to use when needed.

Body language and how to communicate effectively should be prioritized focusing on conflict resolution, negotiations business acumen, and customer service. Individual must be skilled how to look for other options rather than be focused on the problem.

Key elements

Incorporation into Education: The inclusion of soft skills development in academic training, specifically emphasizing the need for improvements in current academic training to highlight the importance of soft skills in engineering practice.

University Emphasis: The impact of university emphasis on soft skills development, underlining that universities with a business focus more in this aspect compared to those concentrated on technical research.

Optional Subjects for Skill Enhancement: Introducing additional (optional) subjects at universities to facilitate soft skills learning, with specific recommendations such as time management and negotiations.

Timing of Soft Skills Acquisition: The timing of acquiring soft skills, presenting varying opinions on whether secondary school or university is more suitable.

Desire for Advanced Skills: It strongly expresses a desire for more advanced communication strength and self-organization skills.

Sequential Skill Learning: The suggested sequence for learning soft skills, beginning with body language and effective communication as the foundation for conflict resolution, negotiations, and business acumen. It then progresses to a solutions mindset and prioritizing work.

Interconnectedness of Skills: soft skills are intertwined, suggesting that learning about one can led to insights into another.

Impact on Performance: The direct impact of soft skills on individual performance, encompassing meeting deadlines, delivering quality work, and securing bids successfully.

Question 4:

Do you think it is essential for potential hires to have specific degrees, bachelor, masters or PhD, or is this not important and why? At which level and for which jobs types is this a factor. Do you find a difference in the level of soft skills between the different degree graduates?

Observation

Having a specific degree is important because is related to knowledge level to better perform the work. Degree is the mainly technical skill and level of soft skills are not related to level of degree. It much depends upon the individuals because currently soft skills are not strongly integrated in the degree programs (any level).

Key elements

Importance of Specific Degrees: Only in positions requiring technical expertise.

Degree Level and Soft Skills: There is no direct link between degree levels (bachelor's or master's) and the evolution of soft skills. It explicitly asserts that the variance in soft skills among graduates is not necessarily tethered to their degree level.

Combination of hard skills and soft skills: The mixture of technical and interpersonal skills constitutes a lever for success in professional careers.

Diplomas VS Soft Skills: Most participants admit that having a diploma does not mean having Soft Skills.

Question 5:

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Would you say your recruitment approach targets:
early career individuals, or mid-career individuals, or late career individuals, or is it not important?
Which individuals are more likely to have the soft skills that you need:
early career individuals, or mid-career individuals, or late career individuals, or it is it not important?

Observation
Depending on the space company, agencies and space industries don't have privilege, in their case all career levels are important because depend on the opening position. In the case of start-ups and young companies, they preference is to have young, enthusiastic, and openminded individuals mainly on early /mid-career level.

Soft skills will vary according to the role and the level of seniority. Mid -career or late career individuals will have developed soft skills compare to young career individuals, this category will be much more proactive and use digital tools and learnings to fill the missing gaps.

Key elements
Recruitment strategies: The importance of matching recruitment to the profiles received and the requirements requested.

The evolution of Soft Skills: The common opinion concerns the possibility that individuals in mid- and late-career hold more Soft Skills and have had time to perfect them through their professional experiences. Their opinion is because they are obliged to apply the skills during their career. Given that schooling does not offer this type of experience and does not allow the development of Soft Skills, it is considered that they are therefore applied during an individual's professional phase.

Development and training of Soft Skills: The regardless of career level or position, everyone can follow internal or external training within the company to develop and improve their skills. However, those at the start of their career are more inclined to participate in this type of training and try to develop new skills necessary for their evolution.

Question 6:
Which soft skills are prioritized during the candidate selection (please rank them)

  – **Technology/digital fluency**
  – **Communication (Interest towards conversation, language articulation (tone of voice, eye contact) etc.**
  – **Business acumen**
  – **Diversity and cultural awareness**
  – **Customer service (e.g help desks)**
  – **Negotiation**
  – **Solutions mindset**
  – **Prioritization and organization of work**
  – **Conflict resolution**

Observation
The provided inventory of soft skills for assessment comprises pivotal attributes crucial for both individual and organizational success. Nevertheless, in mature space agencies there is selection process for the specific

vacancy based on: result orientation, operational efficiency, fostering cooperation, relationship management, continuous improvement, forward thinking.

This is the more -less ranking according to the participants' feedback:

Communication:

− Repeatedly emerges throughout the list.
− Observations intimate a more comprehensive understanding of communication, encapsulating elements such as body language, message assimilation, and the awareness of self-impact.

Solution Mindset:

− Regularly underscored in the list.
− No explicit remarks are furnished, implying a consensus regarding its pertinence and significance.

Technology and Digital Fluency:

− Referenced with comments positing it as more akin to a hard skill rather than a soft skill.
− Indicated as somewhat incongruent within the realm of soft skills.

Prioritization and Organization of Work:

− Garnered a place in the list.
− Devoid of specific comments, signalling accord on its relevance as a soft skill.
−

Conflict Resolution:

− Finds a spot in the list, accompanied by a comment that accentuates its broader connotation, encompassing the adeptness to de-escalate potential conflicts.

Diversity and Cultural Awareness:

− Explicitly mentioned in the list.
− Absence of explicit comments implies alignment on its significance as a soft skill.

Business Acumen:

− Expounded upon with comments expressing challenges in definition due to its expansive scope.
− Skills like forward thinking, operational efficiency, and continuous improvement are considered closer to the essence of business acumen.

Key elements

Communication, solution mindset, prioritization, conflict resolution, diversity, and cultural awareness

Question 7:

Which soft skills are essential- Are there any particular soft skill/s or areas of expertise that you think will be more necessary in the future?

Observation

Based on the answers provided by participants; communication seems to be the most useful and requested skill during recruitment at any type of position.

According to surveys carried out with participants, here are the skills they believe are most in demand.

- – Communication
- – Team spirit
- – Professional curiosity

Some additional skills brought by some participants.

- – Emotional intelligence
- – Empathy
- – Technology and digital fluency

Key elements

Communication is most underline soft skill element.

Digital fluency is the new element which must be consider as a necessary part of soft skills spectrum.

Question 8:

In your opinion is there anything else that your company could do to help ensuring that the soft skills needed within the space sector are met in the future?

Observation

Providing the trainings on soft skills several times per year.

To create STEM and Soft Skills Synergy. To encourage children from early age it considers STEM as an option. Offer to teachers and schools similar as ESERO network.

In reviewing the discourse on STEM education in conjunction with soft skills, several pivotal observations surface, furnishing profound insights for a thorough audit scrutiny:

Interconnection of STEM (Science, Technology, Engineering, and Mathematics) and Soft Skills:

- – The European Space Education Resource Office accentuates the centrality of STEM, particularly in the space sector.
- – Recognizes the imperative to inspire individuals, especially children, to pursue STEM vocations considering societal hurdles, aligning with the overarching objective of ensuring an ample talent reservoir.

Role of the Academic Realm:

- – Illuminates the constricting nature of academic institutions in generating STEM graduates.
- – Advocates a macro-level strategy, advocating for heightened accessibility to STEM education by augmenting resources, facilities, and available slots, cognizant of the infrastructural challenges.

Attraction and Cultivation of Talent:

- Acknowledges the persistent talent rivalry in the space industry and underscores the necessity for a macro-level tactic to guarantee a more extensive pool of candidates.
- Underlines the amalgamation of both technical adeptness and soft skills for a comprehensively equipped workforce.

Collaborative Hurdles:

- Acknowledges impediments in collaboration, discrepancies in requisite soft skills, and an indistinct understanding of the specific skills demanded.

Key elements

STEM or **STEAM** introduce to individuals from the early age

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Question 9:

Do you feel like there is a need to focus on soft skills?
Would it change your business or operating model?
Would you need to rewrite job descriptions?
Would you need to adopt new hiring practices?

Observation

In the case of the talent management, the main focus is on technical skills and technical profiles there is a recognition on soft skills but as a secondary problem. In the case of HR observations, important of soft skills are much more underline but there is not necessarily need to change the current business model but however be aware that is important for overall success of the individual at work. Likewise, if some soft skills are missing, they can be developed directly at job or via training .

In the cases if soft skills are not mentioned in the job descriptions individual are asked during the job interviews. For the mature companies mainly agencies, soft skills represent an integral part of job descriptions and hiring practices more than 20 years back.

Key elements

Impact on Business and Job Descriptions:

- They explore potential repercussions on business and job descriptions if there is an intensified emphasis on soft skills.
- Communicates that soft skills have been part of job descriptions for over two decades.
- Argues that current job descriptions inherently cover soft skills, obviating the need for extensive revisions.

Adaptation of Hiring Practices:

- They contemplate the adjustment of hiring practices to align with an increased focus on soft skills.
- Asserts that the organization has embraced soft skills in its hiring procedures for a substantial duration.

> — Asserts that revising hiring practices is unnecessary, given the ongoing consideration of soft skills.

Question 10:
How has remote working affected your organisation's ability to recruit? Retain? (e.g. more international competition, changes in expectations of potential hires).
How will this impact soft skills needs? On what timescales?
Observation
There is not great deal of difficulty with hiring individuals and proposing remote working. There is still offence of some individuals to lingering reluctance to relocate despite the prevalence of remote work. Some touch on the consequences of remote work on skills and organizational dynamics and acknowledges the influence of remote work on organizational skills, particularly due to the scarcity of face-to-face communication.
Key elements

Remote Work and Talent Dynamics:

> — The sources explore the effects of remote work on talent dynamics, particularly in recruitment and retention.
> — Highlights requirement for proximity and potential relocation for new recruits.
> — Points to a smooth recruitment and retention process despite the prevalence of remote work.

Soft Skills in Remote Context:

> — Some texts underscore the significance of soft skills in the domain of remote work.
> — Suggests that remote work doesn't directly impact soft skills but poses challenges in specific virtual conversations.
> — Emphasizes the heightened importance of soft skills for effective communication in remote working scenarios.

Adapting Soft Skills to Virtual Environment:

> — They discuss the need to adapt existing soft skills to the virtual or hybrid work setting.
> — Expresses a focus on adjusting current soft skills to the virtual/hybrid context rather than cultivating new ones.
> — Stresses the critical role of soft skills in successful communication within remote projects.

Importance of Soft Skills:

Every participant underscores the significance of soft skills, sometimes deeming them as crucial as technical skills. Some feedback detail specific soft skills or expected behaviours, such as business acumen, tool proficiency, awareness skills, values aligned with the company, collective values, and values mandated for employees.

The participants acknowledge employee involvement and underscore the significance of both university and on-the-job training. Soft skills are portrayed as indispensable, on par with technical skills, with specific behaviours and values emphasized throughout the documents.

All feedback recognizes the significance of soft skills, encompassing communication, adaptability, time management, and effective learning strategies.

4. CONCLUSIONS AND RECOMMENDATIONS

Space Sector Skills Survey 2023 (UK) [2], employers said:

- 38% of the workforce lacks soft skills.
- 52% of job applicants lack soft skills.
- 42% think more soft skills are needed in the future.

In the space sector, technical expertise is complemented by Soft Skills which lead missions to success. They contribute in their own way to the smooth technical, but also human, progress in the industry and as a whole.

The significance of soft skills is acknowledged by both academia and companies, especially in a tech-focused sector. There is a stressed need for collaboration between academia and companies to address the growing complexity in the industry, necessitating soft skills related to project management and teamwork. However, a cultural shift within companies is considered essential to align the focus on technical and soft skills. Observation and feedback mechanisms, including interviews and assessments, play a crucial role in evaluating soft skills during recruitment. The emphasis on both technical and soft skills is deemed essential for the comprehensive development of candidates, aligning with the evolving demands of the industry.

Following conclusions and recommendations on soft skills gaps are based on the survey feedback and discussion obtained collectively from participants.

Learning Soft Skills

There is a belief that the practical application is essential for developing soft skills, suggesting a need to change the approach and methodology in schools and universities to incorporate these skills into existing subjects. Soft skills have to be integrated in the curricula already in the primary and secondary education in the period of life when individual develop personal behaviour.

A case is presented for placing more emphasis on basic business skills in the university curriculum, recognizing that job-specific and company-specific skills must be addressed post-education.

A majority expresses their analysis of the evolution of Soft Skills through participation in additional training and professional experiences after university diplomas, at job.

Maintain external and internal training dedicated to the development of general skills while focusing on fundamental performance.

Recommendations:

- Spotlights cooperative efforts with educators, schools, and universities to facilitate soft skills honing alongside technical acumen.
- Integrate in curricula exercises on interdisciplinarity, teamwork, time management, negotiation, and problem solving

- Accentuates the indispensability of early engagement with children to nurture enthusiasm for STEM, addressing the talent competition and macro-level predicaments in the space industry. Acknowledges the dynamic evolution by introducing the STEAM paradigm, integrating arts into STEM education.
- At work, develop targeted training in the acquisition of new skills.
- Prioritize continuing education to improve the value of professional and interpersonal skills.
- Continually develop key skills for certain positions, such as leadership and behavioural skills within teams

Soft Skills Assessment

The analysis portrays a consensus regarding the significance of pivotal soft skills such as communication, solution mindset, prioritization, conflict resolution, diversity, and cultural awareness. Nevertheless, queries arise about the categorization of technology and digital fluency as a soft skill, with inclinations towards viewing it as more aligned with hard skills. The intricacies associated with business acumen, and the proximity of certain skills to its concept, underscore the necessity for precise definitions and unambiguous categorizations to ensure effective evaluation of soft skills in recruitment and performance assessments.

The analysis of the responses reveals the importance of communication as a key factor in a multitude of facets. It allows you to intervene in the resolution of problems, lead negotiations and manage teams. In combination with the other skills mentioned such as team spirit, professional curiosity, etc., communication is the most rewarding skill and makes it possible to impact the success of the professional career at stake.

Recommendations:

- Establish a global vision and consideration of skills in professional success. Highlight the need for the sustainable integration of Soft Skills in professional organizations.
- Recognize Soft Skills as necessary skills for professional careers.
- Consider a generalized approach in the evaluation of Soft Skills by recognizing their impact, usefulness, and nature in the job function.
- Highlight the importance of additional training to complement professional experience in the development of Soft Skills to complement diplomas.
- Encourage companies to implement generalized approaches to evaluate and develop the Soft Skills necessary for everyone's professional development.

Soft Skills in Recruitment procedures

The participants have a common vision regarding recruitment strategies and factors for improving interpersonal skills. Balancing professional careers in the organizational structure likewise recognize the value of Soft Skills in the job description and recruitment process. They admit the correlation between Soft Skills and technical diplomas allowing good application and both must be considered equally.

Everyone emphasizes the fact that it is important to maintain a certain balance between recruitment requirements and the skills useful and beneficial to the position to maintain a good organizational structure.

Recommendations:

- Soft skills must be a part of the job description requirements.
- Adapt recruitment strategy to remote/ hybrid environment and develop the new soft skills.

Remote work

Remote work doesn't have direct impact on the soft skills, but some difficulties were spotted mainly in communication.

Recommendations:

- Maintain good momentum in the implementation of remote work by promoting communication.
- Set up training adapted to hybrid and remote work by offering sessions targeting the skills necessary for this new professional position.

The combination of the planting of knowledge of Soft Skills within universities in connection with professional pursuit accompanied by training would be the key to the success of all companies, especially in technical sectors which are cruelly lacking in Soft Skills which are put aside during studies.

Collaboration between the academic world and the professional world highlights the fragility of Soft Skills for certain profiles, thus affecting their professional success and their development within companies. The emphasis on the analysis of Soft Skills during recruitment reflects the new culture of companies which tend towards a more global consideration of individuals, beyond their diplomas. In addition, this approach promotes the integration of all career levels, each of which has positive factors to contribute.

5. ACKNOWLEDGEMENTS

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D-Orbit
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European Space Agency
HE Space
Leanspace
Luxembourg Space Agency
Maana Electric
OHB
Thales Alenia

*Companies arranged in alphabetical order

6. REFERENCES

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7. APPENDIX A – QUESTIONNAIRE

1. Where have the people currently working in your organization gained their soft skills? (e.g. at university, on the job, in other jobs/sectors)
How does your organization train or support employee training in soft skills?
For your current employees, what are the primary mechanisms they have acquired and developed soft skills?

2. The space sector faces difficulties finding employees with the expected soft skills. Where do you think the issues are coming from in the soft skills pipeline? (e.g. Academia, individual companies, a lack of support from sector bodies).
What needs to change?

3. How does having exceeding or insufficient soft skills impact your organisation, relative to the expectation of the job?
Is current academic training working well? If not, what should be changed?
Which soft skills should be acquired at which career stage? Starting from post-secondary school (into university/college).

4. Do you think it is essential for potential hires to have specific degrees, bachelor, masters or PhD, or is this not important and why? At which level and for which jobs types is this a factor. Do you find a difference in the level of soft skills between the different degree graduates?

5. Would you say your recruitment approach targets:
early career individuals, or mid-career individuals, or late career individuals, or is it not important?
Which individuals are more likely to have the soft skills that you need:
early career individuals, or mid-career individuals, or late career individuals, or it is it not important?

6. Which soft skills are prioritized during the candidate selection (please rank them)

   – Technology/digital fluency
   – Communication (Interest towards conversation, language articulation (tone of voice, eye contact) etc.
   – Business acumen
   – Diversity and cultural awareness
   – Customer service (e.g help desks)
   – Negotiation
   – Solutions mindset
   – Prioritization and organization of work
   – Conflict resolution
   – Other:

7. Which soft skills are essential- Are there any particular soft skill/s or areas of expertise that you think will be more necessary in the future?

8. In your opinion is there anything else that your company could do to help ensuring that the soft skills needed within the space sector are met in the future?

9. Do you feel like there is a need to focus on soft skills?
Would it change your business or operating model?
Would you need to rewrite job descriptions?
Would you need to adopt new hiring practices?

10. How has remote working affected your organisation's ability to recruit? Retain? (e.g. more international competition, changes in expectations of potential hires).
How will this impact soft skills needs? On what timescales?

8. APPENDIX B – WORKSHOP INTERACTIVE DISCUSSION

During the workshop it was run Interactive discussion based on received feedback on proposed questions:

1. Where have the people currently working in your organization gained them soft skills? (e.g. at university, on the job, in other jobs/sectors)
How does your organisation train or support employee training in soft skills?
For your current employees, what are the primary mechanisms they have acquired. and developed soft skills?

Key Word	Point of view
o Soft Skills Development o Training Opportunities o On-the-Job Development o External Training o Employee Involvement o Observational Approach. o Influenced by their natural Inclination/education/social education	The importance of on-the-job soft skills development. Online platforms Majority development on the job. Training opportunities and active employee involvement, acknowledging the challenge of assessing skills. Social Pressures/training Natural inclination = key factor Self-awareness is a challenge, but Training and tools facilitate development (e.g. leadership training

2. The space sector faces difficulties finding employees with the expected soft skills. Where do you think the issues are coming from in the soft skills pipeline? (e.g. Academia, individual companies, a lack of support from sector bodies). What needs to change?

Key Word	Point of view
o Neglect of Soft Skills o Focus on Technical Skills o Recruitment Practices o Limited Soft Skills Education o Measurement of Soft Skills o Importance of Soft Skills	Neglect of soft skills in education and recruitment, attributing it to a strong focus on technical skills. A shift in recruitment practices to give more importance to soft skills. Limited attention in education and their essential role in overall performance. Lack in schools and universities.

3. How does having exceeding or insufficient soft skills impact your organisation, relative to the expectation of the job?
Is current academic training working well? If not, what should be changed?
Which soft skills should be acquired at which career stage? Starting from post-secondary school (into university/college).

Key Word	Point of view
o Importance of Soft Skills o Integration into Education o Impact on Performance o University Focus o Optional Subjects for Skill Development o Timing of Soft Skills Acquisition o Sequential Learning of Skills o Interconnectedness of Skills o Trainings o Life Skills o Positive feedback	The vital role of soft skills in organizational success + integration into university training, particularly engineering. Hard skills are the "WHAT" and soft skills are the "HOW"! Direct impact of these skills on individual performance Introduce optional subjects at university level (time management/negotiation/conflict resolution/ customer service…) More impact on small companies

4. Do you think it is essential for potential hires to have specific degrees, bachelor, masters or PhD, or is this not important and why? At which level and for which jobs types is this a factor. Do you find a difference in the level of soft skills between the different degree graduates?

Key Word	Point of view
o Importance of Specific Degrees o Min Master, PhD for Sci positions o Recognition of Soft Skills o Combination of Technical and Soft Skills o Training and Work o Learn on the job o Good trainings o Certifications o Personal project / Flexibility	The importance of specific diplomas, particularly for technical functions. (European perspective of "Engineer" vs "Chartered Engineer") The possession of a technical diploma does not necessarily reflect an individual's non-technical skills. Recognizing non-technical skills as an essential factor in professional success Level of soft skills not = Degree level

5. Would you say your recruitment approach targets:

early career individuals, or mid-career individuals, or late career individuals, or is it not important?
Which individuals are more likely to have the soft skills that you need:
early career individuals, or mid-career individuals, or late career individuals, or it is it not important?

Key Word	Point of view
o Recruitment all career individuals with preference on early and mid o Soft Skills Development o Importance of Soft Skills o Individual's Role in Soft Skills Development o Training and Skill Enhancement	Recruitment approach targeting individuals at different career. Levels=soft skills development. Mid- to late-career individuals = have soft skills through experience. important for all roles

6. Which soft skills are prioritized during the candidate selection (please rank them) → top 3

- o Technology/digital fluency
- o Communication (Interest towards conversation, language
- o articulation (tone of voice, eye contact) etc.
- o Business acumen
- o Diversity and cultural awareness
- o Customer service (e.g help desks)
- o Negotiation
- o Solutions mindset
- o Prioritization and organization of work
- o Conflict resolution
- o Other:

Key Word	Point of view
▪ Communication ▪ Solution Mindset ▪ Technology and digital fluency	
▪ Communication ▪ Prioritization and organization of work ▪ Solutions mindset	
▪ Conflict resolution ▪ Solution Mindset ▪ Communication	

▪ Technology digital fluency ▪ Communication ▪ Conflict resolution	Result orientation/Operational efficiency/Fostering cooperation/ Continuous improvement/Forward thinking
▪ Communication ▪ Candidness ▪ Teamwork	
▪ Communication ▪ Solution Mindset ▪ Prioritization and organization of work	How to do job applications and career planning and development (including developing the skills mentioned above) Support for students and early careers in terms of financial, relocation, integration, and cultural or language skills.

7. Which soft skills are essential- Are there any particular soft skill/s or areas of expertise that you think will be more necessary in the future?

Key Word	Point of view
▪ Communication ▪ Team spirit ▪ Professional curiosity	
▪ Emotional intelligence ▪ Empathy ▪ Communication ▪ Problem solving	
▪ Communication	
Depending on the job request	
▪ Digital Fluency ▪ Technology	
▪ Open minded ▪ Pro active ▪ IA	

8. In your opinion is there anything else that your company could do to help ensuring that the soft skills needed within the space sector are met in the future?

Key Word	Point of view
o Trainings / mentors o Courses o Priority o Early age o Schools o Communicate o Need o Training	Encourage individuals = children via STEM Collaboration with teachers and schools is underway ESERO Soft skills training within universities

o University o Curriculum	Train a workforce with technical expertise + essential soft skills
o Talent Attraction and Development o Collaboration and Support o Variation in Soft Skills o Industry-specific Soft Skills	Talent attraction and development Collaborating with partners & individual companies Variations in required soft skills. Uncertainty about the specific soft skills

9. Do you feel like there is a need to focus on soft skills?
Would it change your business or operating model?
Would you need to rewrite job descriptions?
Would you need to adopt new hiring practices?

Key Word	Point of view
o Focus on Soft Skills o Integration of Soft Skills Training o Business Impact and Job Descriptions o Hiring Practices	Some companies: Still technical skills are prioritized. Soft skills are already an integral part of job descriptions. No need to rewrite job. New hiring: probably not

10. How has remote working affected your organisation's ability to recruit?
Retain? (e.g. more international competition, changes in expectations of potential hires).
How will this impact soft skills needs? On what timescales?

Key Word	Point of view
o Remote Working and Relocation o Soft Skills in Remote Working o Adapting Soft Skills to Virtual/Hybrid Environment o Communication Challenges o Impact on Skills o Self-organization o Individual case o Policy with balance o Harder to recruit	The impact of remote work on recruitment, retention, and soft skills. Remote work has not significantly affected hiring and retention. The continued importance of soft skills in remote work=successful communication. Adapt existing soft skills to the virtual/hybrid work environment. No need soft skills for remote job Don't affect the ability to recruit.

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