

SOFT SKILLS IN RESEARCH

“A **stable** ecosystem
of **non-technical** skills
gained through **experience**
working in a **collaborative** environment
with the goal of **innovating** in mind”

Disclaimer

- Not an expert* in soft skills!
- Mostly based on interactions with researchers (business school, sociology, psychology) on the topic and on their study (6 year field research with 364 actors in small to very big companies)
 - *Les Soft Skills liées à l'innovation et à la transformation des organisations. Du Roscoät, Servajean-Hilst & Bauvet 2022, Institut de la Transformation et de l'Innovation (ITI), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4070668*
- Some reflections on soft skills & research are work in progress!

* pretending to know a topic when presenting it is not a soft skill :)

SOFT SKILLS

creativity

INTERPERSONAL SKILLS

POWER SKILLS

COMPÉTENCES TRANSVERSALES

autonomy

leadership

BEHAVIORAL SKILLS

TRANSFERABLE SKILLS

communication

initiative

COMPÉTENCES SOCIO-PROFESIONNELLES

teamwork

COMPÉTENCES NON-TECHNIQUES

EMOTIONAL INTELLIGENCE

networking

adaptability

SOCIAL SKILLS

resilience

COMPÉTENCES POLYFONCTIONNELLES

this and that

"Skills" : sets of competencies required for job employment / success in a job

"Competencies" : skill proficiency, possession of sufficient knowledge / ability in some areas

Confusing...

- **Elusive**, many global definitions, every source provides a different skillset
 - Often arbitrary **opinions** related to **specific** workplace or even to **purely personal** development
- Few comprehensive studies approaching soft skills in a **rigorous** way
 - Rarely tackling links with research / PhDs
- Not a focus of French education system, often over-simplified as “savoir-faire, savoir-être, faire faire etc.”

Yet crucial...

- Increased recognition in private and public companies, especially when **innovating** is a focus
 - Startups and big companies alike
 - Many newspaper articles in France since 2022 (Le Monde, Figaro...)
 - **Remote working** has become general, ≠ perception of workplace, new ways of communicating & interacting
- **PhD** diploma increasingly valued, partly through problem-solving and soft skills
- **AI's** influence zone increases, leaving/redefining areas where **human interactions** are particularly important
- Well-being, benevolence, and self-confidence are precious
 - Importance to situate oneself, realize acquired skills, being able to put forward skills even with negative results



Hard skills

- Generally speaking: “**expertise**” in a given field, **job-specific** technical skills
 - Hard skills are always **necessary** to be successful in a job
- Large part of fundamental and instrumental research’s activity and evaluation
 - In research: programming, using/developing tools & instruments, producing a communication, knowledge of the theme...
- Proficiency expected to be easily **compared** and **improved** (training)
- Career transition / hiring process
 - **Academia** → **academia**: different expertise areas but hard skills easily adapted / understood. CVs and interviews need only minor adaptations.
 - **Academia** → **normal world**: hard skills may lack relevance & applications. CVs and interviews need major work.
 - Similarly, soft skills are used in ≠ ways in different contexts but they remain 1) **identical** and 2) **important**

Definition of soft skills

- *ITI report 2022* – “Soft skills are a **dynamic** and **connected** ensemble of skills geared toward the development of the **individual** and **collective** ability of people to **situate** themselves, to **interact**, and to **shape** an environment with the goal of **innovating** in mind”
- Not personality traits per se...
 - e.g., curious, patient, brave, driven, calm, modest, spontaneous, enthusiastic, passionate....
- ...but attributes that define how people interact with each other & the environment to reach personal and common goals
 - /!\ Such attributes may build upon above traits...
- Soft skills are not job-specific and can therefore be **transferred** to other, potentially **very** ≠ professional contexts
 - They are not even restricted to the work context as they may be acquired and used throughout everyday life

Why a deep analysis of soft skills?

- **Common** reference of skills and their definition (especially within national context)
- Framework to evaluate their **impact** on performance
- Deeper understanding necessary to convince oneself and others
 - Need reflexivity (“self-reflection”) and reflection through others
 - Need to understand in what practical context skills are used



I take initiatives
and I can be
autonomous!

The illustration shows two stylized human figures in profile, facing each other. The figure on the left is speaking, with a speech bubble containing the text 'I take initiatives and I can be autonomous!'. The figure on the right is listening, with a thought bubble containing the text 'Hmmm...'. The background is a gradient of purple and blue with several overlapping circles of varying shades.

Hmmm...

ITI 2022 study

- Goals

- What skills are needed to **innovate**, what is their relative **importance**?
- Analysis & recommendations (hiring process, school, training...)

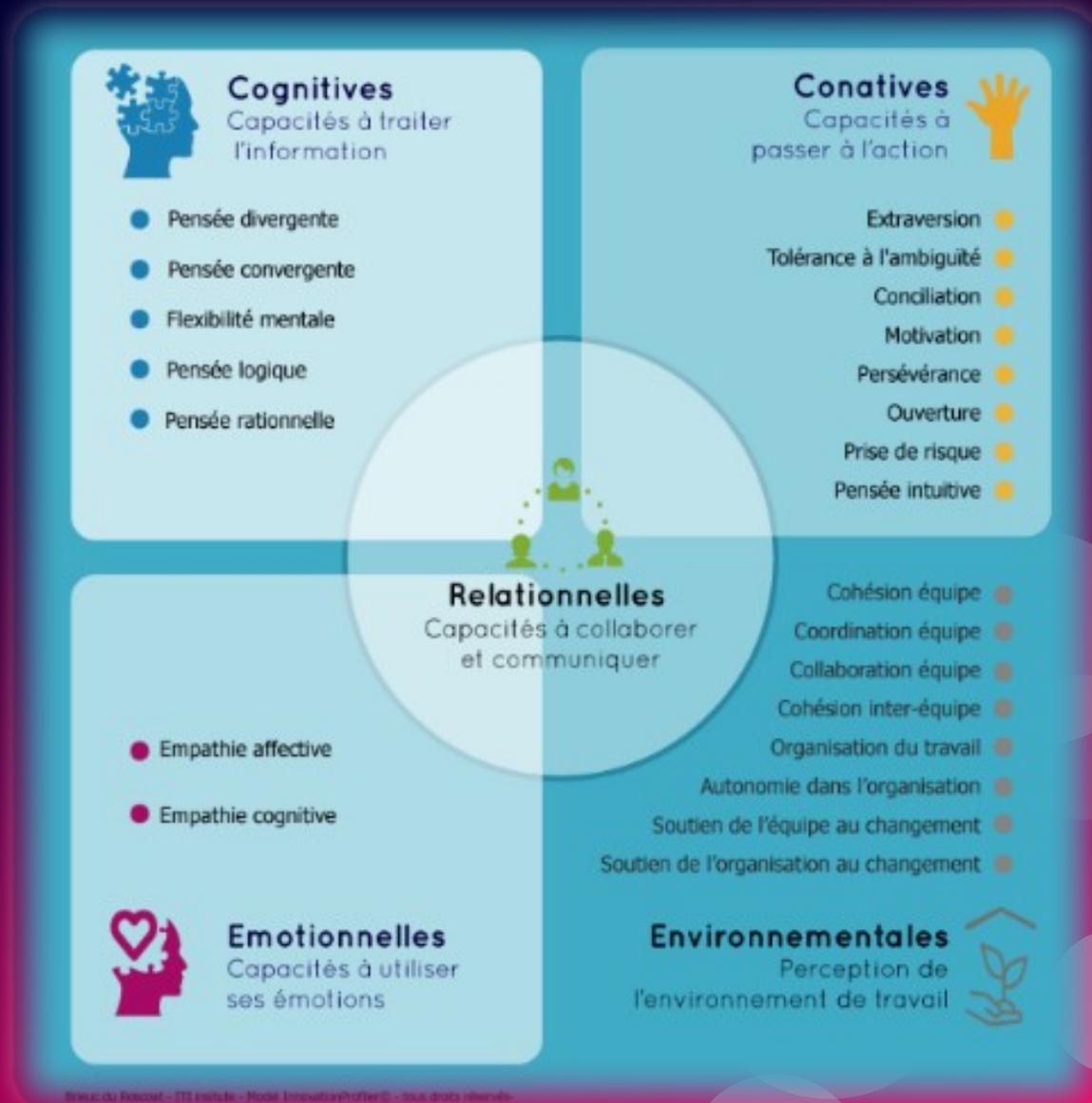
- Takeaway

- **65%** of important skills to innovate are soft skills
- 23% are personality traits
- 12% are job/business (hard) skills

*! Soft skills represent a **large** reservoir of important, distinct, skills, while hard skills represent a smaller (but essential!) skillset*

SOFT SKILL SET

- Note in the following the constant links between the individual, the team, and the context (environment) in which they evolve
 - We can talk about **group skills** and **environment skills**
 - Skills are always used with a **collective** goal in mind (team/company)
 - Even if some ideas may be individual, successful innovation implies the **action** of numerous people
- Mini-game
 - Find one skill that is not used or acquired one way or another during a PhD or a career in research!



Cognitive skills



(aka, ability to process & treat the surrounding information)

- Logical thinking and reasoning (problem solving, deduction...)
- “Mental flexibility”: ability to change / update opinion with new knowledge, treat information of different kind (reaction to dead ends or negative results...)

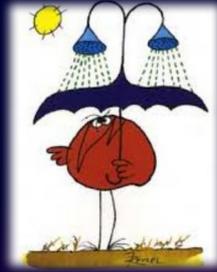
“*Pensée divergente*”: finding different solutions from a single state (creativity, proposition, thinking outside the box...)



“*Pensée convergente*”: synthesizing multiple information toward one solution, gather elements into a single concept (global, holistic view of things...)

“Breathing rhythm of the transforming creativity”

Conative skills



(aka, ability to act)

- **Intuitive thinking**: use own experience to think (and act) fast
- Measured **risk taking**: for oneself, team, company
- **Open to novelty**: intellectual curiosity, looking for new takes
- **Deal with (even look for) ambiguity**: contradicting information, taking time to solve complex situations, not easily jump to conclusions
- **Social abilities**: develop relationships / network, extroversion, self-confidence, sociable, cooperate in harmony, avoid conflicts, conciliate

Motivation

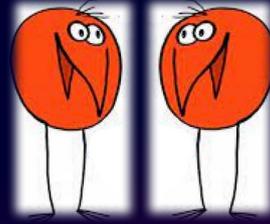
- Intrinsic needs (acting for own mental state of mind)
- Extrinsic needs (acting to obtain a promotion, recognition)
- Can fluctuate



Perseverance

- Keep doing in a constant, reliable, way

Emotional intelligence skills



(aka, ability to use & deal with emotions)

- Understand others' point of view: **cognitive empathy**
- Recognize own and others' emotions: **affect empathy**
- Interacting with positiveness, sharing dynamism and passion, benevolence, kindness, and indulgence
 - Incl. politeness toward collaborators, constructive feedback, respect...
- Emotional skills build upon traits (general attitude) that define personality even away from workplace
- Bottom line: being human is also useful to reach common objectives...!

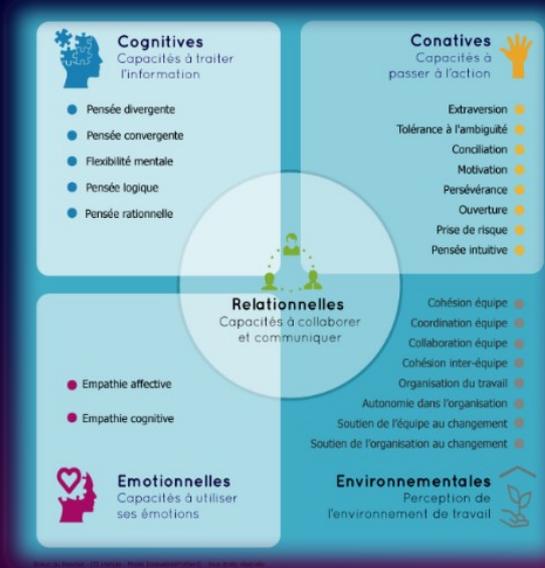
Environmental skills



(aka, ability to perceive well and use the context)

- **Coordinate** people & efforts, agree on objectives (inc. team objectives): complementing own and hierarchy's objectives
- Team **collaboration**, **sharing** information
- **Cohesion** within and between teams, making a trusting workplace
- **Autonomy** and **initiative** (accounting for others!), take decisions
- Work **organization**
- Understand need for **change** accounting for cultural and institutional **limits**
- Understand **culture** of institution

Relational skills

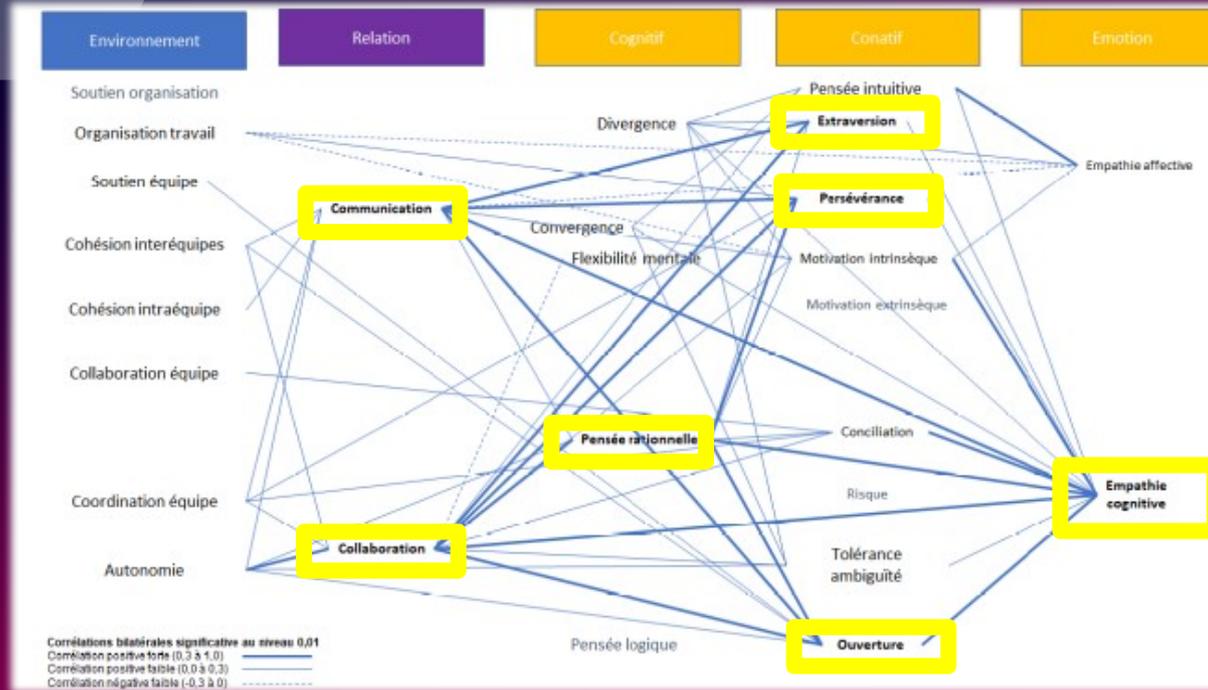


(aka, ability to collaborate and communicate)

- Individual skills that irrigate and connect the 4 groups
 - e.g., creativity is useful **only through a collective effort**
- Making **collaboration** possible: adaptation, coordination, leadership, create links...
- Making **communication** possible: expression, being understood, listen to and understand others, persuasion

Pivot skills

(not necessarily the strongest but the ones that connect with the most)





Correlations

- **Autonomy ↔ Tolerance to ambiguity**
 - Success in being autonomous improves tolerance to ambiguity
- **Autonomy ↔ Collaboration**
 - Being / remaining autonomous requires good communication / collaboration
- **Perseverance ↔ Organization**
 - Good organization and clear objectives provides stable environment that is fertile ground for perseverance



Anti-correlations

- **Affect empathy ↔ Organization**
 - Much affect can question too much the organization
- **Collaboration ↔ Mental flexibility**
 - Too many interactions (collaboration) may slow down the process of updating opinion and treat information
- In general, very few anti-correlations and mostly **excesses**
 - There's such a thing as counterproductive soft skill excess proficiency (contrary to hard skills!)

Acquire and improve soft skills?

- Globally: soft skills are improved through **experience** and **training** throughout **life + work**
- **Reflection**
 - **Reflexivity**: learning from own experience & **guidance/mentorship/"witnesses"**: learning from others' point of view
- Extra-curricular, extra-work social activities (i.e., ≠ contexts)
- Training workshops/courses focused on soft skills
 - Favor **collective** decisions, develop a thriving environment where **better answers may emerge**
- Learning a **language!** (within a class, traveling...)
 - Immersion builds confidence, cultural context/sensibility
 - Student-centered, written/oral communication, intuitive grammar learning through implicit/inductive approach...
 - Soft skills actually part of evaluation (participation → initiative, group work, expression...)
 - Universal, anybody can do it, at any age

(some) ITI report recommendations

- Acknowledge importance of soft skills in **first years of education**
 - Favor collective work, train teachers...
- Acknowledge that soft skills are not innate and can be **improved** on
- **Technical and scientific teaching** should include work favoring soft skills
- Favor diversity (disciplinary, cultural)
- Train managers to learn how to evaluate quantitatively
- Encourage personal initiatives at workplace
- + some specific recommendations for private & public institutions / companies



- **Proficiency is qualitative, but it's not 1 or 0**

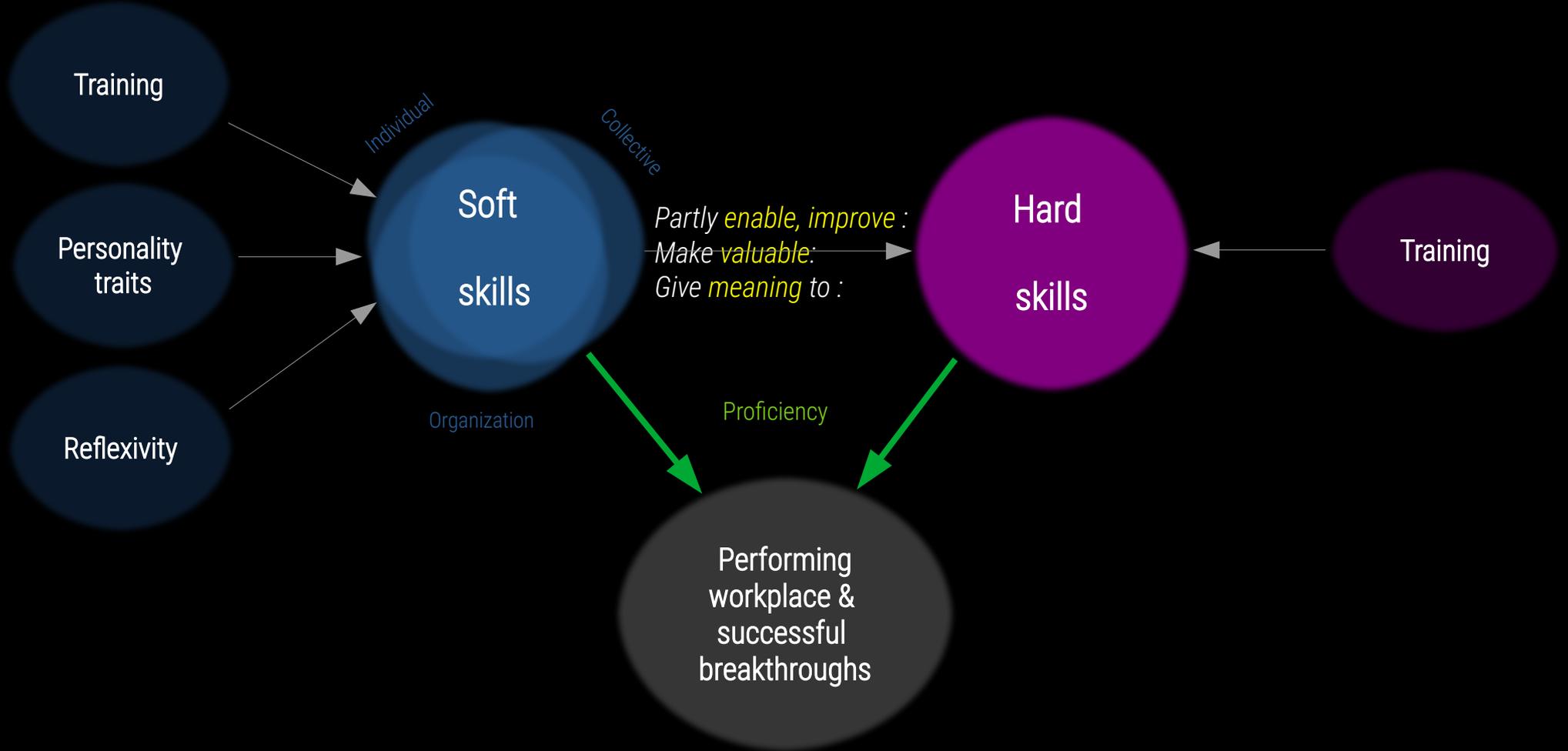
- The process of reflecting on those skills and identify “strong / signature” or “weak” skills is, however, already very useful to roughly evaluate one’s proficiency and identify skills to improve on
- Self-evaluation is useful but not enough, soft skills need to be validated by others and/or by enabled achievements

- **Translating soft skills**

- Even though soft skills remain the same across different fields / workplaces, soft skills need to be re-articulated much like hard skills, using illustrations and examples indirectly showing how they **have been useful** and how they are envisioned to **remain useful** in the new workplace
- May be better to let soft skills simply **emerge** from these examples and illustrations, without being a direct focus (unless soft skills are directly addressed in job)

Not job-specific (stable)

Job-specific (dynamic)



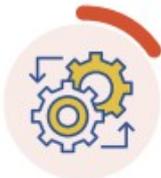
- “Toward a skill revolution”
- 2023 was the European year of skills!
 - Thousands of events and activities on skill development across Europe
 - Lots of resources for green economy, digital skills, gender gaps etc...



Transversal skills like critical thinking, teamwork, and learning skills are essential for work, education and daily life. Developing and recognising these skills play an important role in promoting sustainable economic growth, social inclusion, and competitiveness. The EU supports employers, workers and training institutions in advancing these skills.

THE SITUATION

Human creativity, emotional intelligence and innovation remain irreplaceable, even if:



14% of jobs are highly automatable



32% of jobs might change substantially due to AI within this decade

Both workers and employers value transversal skills that help to adapt the changing work landscape, particularly in the green and digital transitions.



24.5% of candidates lack transversal skills.

SMEs in the EU see a growing importance of these transversal skills:



68%
for soft skills



62%
for digital skills



42%
for green skills

- **Erasmus+ program**
 - Develop key competences and transversal skills, through study, work, or volunteering experiences abroad
- **Horizon Europe**
 - Funding for projects that promote the development of transversal skills such as creativity, critical thinking, and problem-solving
- **Recovery and Resilience Facility (RRF)**
 - Funding opportunities for the development of transversal skills associated with the green and digital transition.

Role and importance of soft skills in research

- Relevance to research
 - Research is **innovation** by definition (ideas becoming realized)
 - An innovator is always a **co-innovator**
- What skills are acquired during a PhD and through a career in research?

Soft skills are an essential part of the PhD experience

- Expected skillset validated by the diploma:
 - **Perseverance**: long & hard journey filled with uncertainties, even failures, clear objectives vs. unclear outcomes, accept / provide feedback and criticism
 - **Gathering & digesting information**: literature, extract consensus, holistic approach, identify & use reliable sources
 - **Communication**: written & oral, producing a paper that can be cited, conciseness, different languages, points of view, cultures
 - **Collaboration**: group work, contributing, proposing, delegating, team & organization objectives
 - **Problem-solving**
- Building self-confidence
 - Situate oneself, immersion through a collaboration where initiative is encouraged, building a personal skillset that will be carried through life, even with <0 results
- Career transitioning

Deal with negative results

Meet (multiple) deadlines

Organize events

Live in different countries

Build trust

Persuasion

Being organized

Holistic understanding (big picture)

Understand / listen to others' point of view

Building a network

Working with a large collaboration

Initiative using original ideas

Work with different cultures

Ethical considerations

Outreach

Supervising interns

Provide feedback on papers/talks

Autonomy to facilitate organization

Share results

Creativity and need to change

Update opinion

Public talk

Expanding soft skills in research: Asking oneself and others the right questions

- What are we trying to achieve, why, who will benefit from it?
- How can the field progress (either through oneself, others, or collaborations)?
 - Would a specific **collaboration** make the work more efficient or impactful?
- Are the envisioned **risks** worthwhile for the project and collaborators?
- Cast a wide **network**, how is the community organized?
 - **Confront** ideas, **compare** approaches, collaborate with competitors
- **Organize** work in the best way possible (individual, collective, delegation...)
- **Put oneself in the shoes of...** (emotional intelligence skill)
 - Collaborators
 - Person receiving the feedback
 - Reader, audience
 - Hierarchy, employer

Experience, management requirements, and involvement in organization imply an increasing level of soft skills throughout a career

Conveying soft skills in research

Even though soft skills have been identified / acquired / improved, it remains difficult to:

- convey them to others,
- convince how they have been impactful

Soft skills naturally emerge and are validated from general work output (papers, talks, networks...), leading to some qualitative indicators (e.g., collaborations, leadership of projects...)

Rapport bilan section 17 (mandat 2016-2021)

Critères pour une recherche de qualité

Un travail de recherche de qualité se définit par des critères qualitatifs variés. L'aspect qualitatif de l'évaluation concerne, entre autres, l'originalité des travaux menés, la créativité, les collaborations et la prise de risque.

Sont gages de qualité :

- ▷ Compétences, expertise scientifique, expertise méthodologique,
- ▷ Impact des travaux,
- ▷ Potentiel immédiat, potentiel à long terme,
- ▷ Créativité,
- ▷ Originalité et pertinence des orientations scientifiques,
- ▷ Efficacité collaborative,
- ▷ Capacité à faire émerger des projets, à diriger des projets,
- ▷ Leadership au bénéfice de la communauté,
- ▷ Mobilités thématique ou géographique, qui ne sont pas une fin en soi, mais témoignent de l'autonomie et de la capacité d'adaptation du chercheur.

Select Subclass

Researcher

Bookworm (literature knowledge): 50

Pythoner: 75

English level: 40

Basic resistance to referee report: 75%

Class potion:

- Coffee rejuvenation mug

Class item:

- Sacred robe of glory (100% chance to graduate)

Class-specific skills:

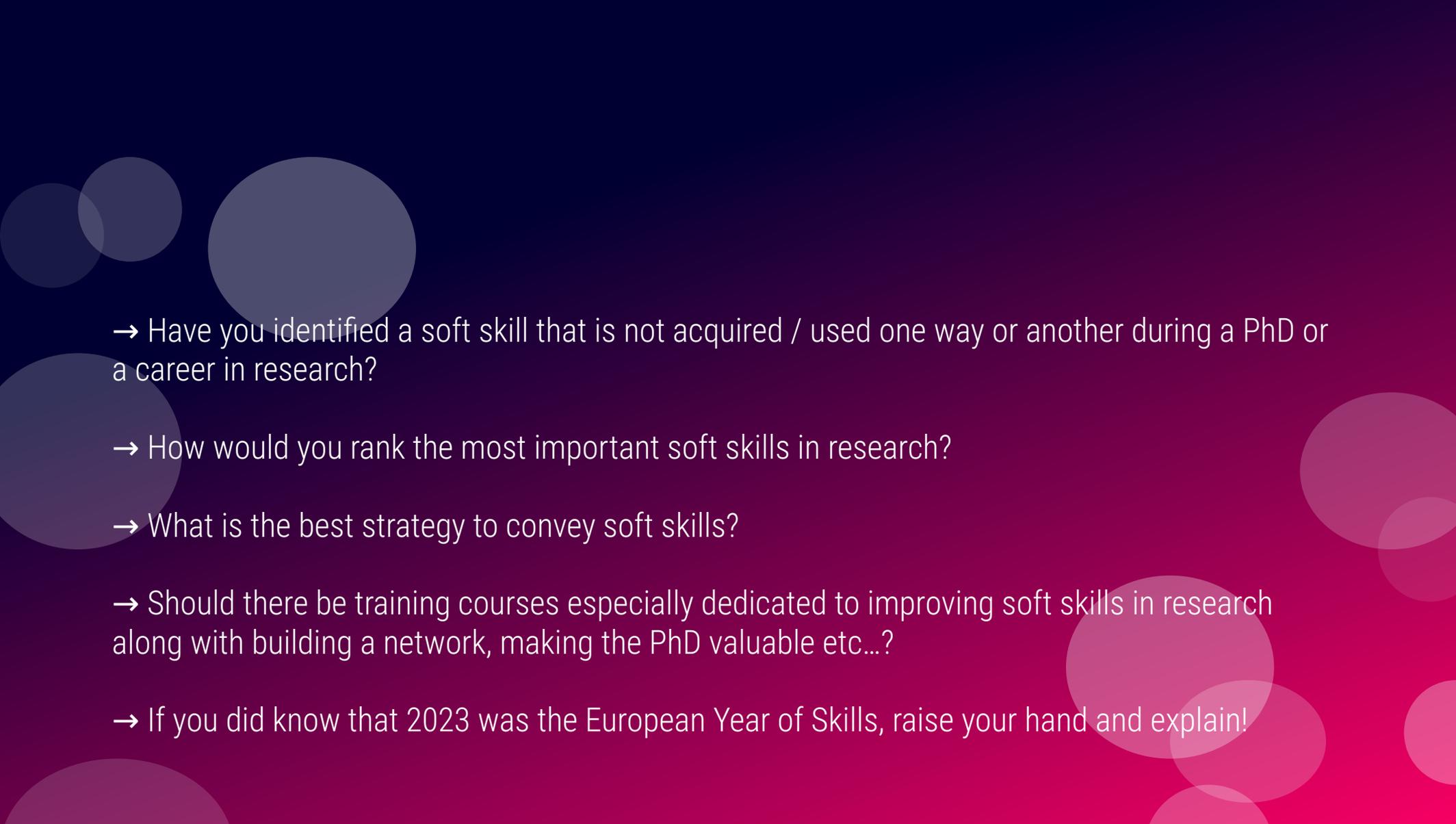
- Summon 3 level 1 interns
- Increase work speed by 10%
- 25% more chance of solving bugs
- 20% chance of deadline being extended
- 100% chance of work taking 3x time
- 0% chance of teleporting to conference
- 0.00001% chance of dropping Nobel rune

“A **stable** ecosystem of non-technical skills gained through **experience** working in a **collaborative** environment with the goal of **innovating** in mind”



Talents

- Encourage allies
- Initiative +1
- Conviction aura
- Perseverance: 90% chance of playing again in current round
- Charming talk (quantity: 2)
- Risk taking: 50% chance of dealing 2x better results
- Dual wielding of programming languages
- Lone wolf (maximum difficulty)

- 
- Have you identified a soft skill that is not acquired / used one way or another during a PhD or a career in research?
 - How would you rank the most important soft skills in research?
 - What is the best strategy to convey soft skills?
 - Should there be training courses especially dedicated to improving soft skills in research along with building a network, making the PhD valuable etc...?
 - If you did know that 2023 was the European Year of Skills, raise your hand and explain!