Transferable skills for researchers.

Professional development in motion

Euraxess 13th May 2021

Webinar presentation

TRANSFERABLE SKILLS

Interdisciplinary skills that enhance the workplace

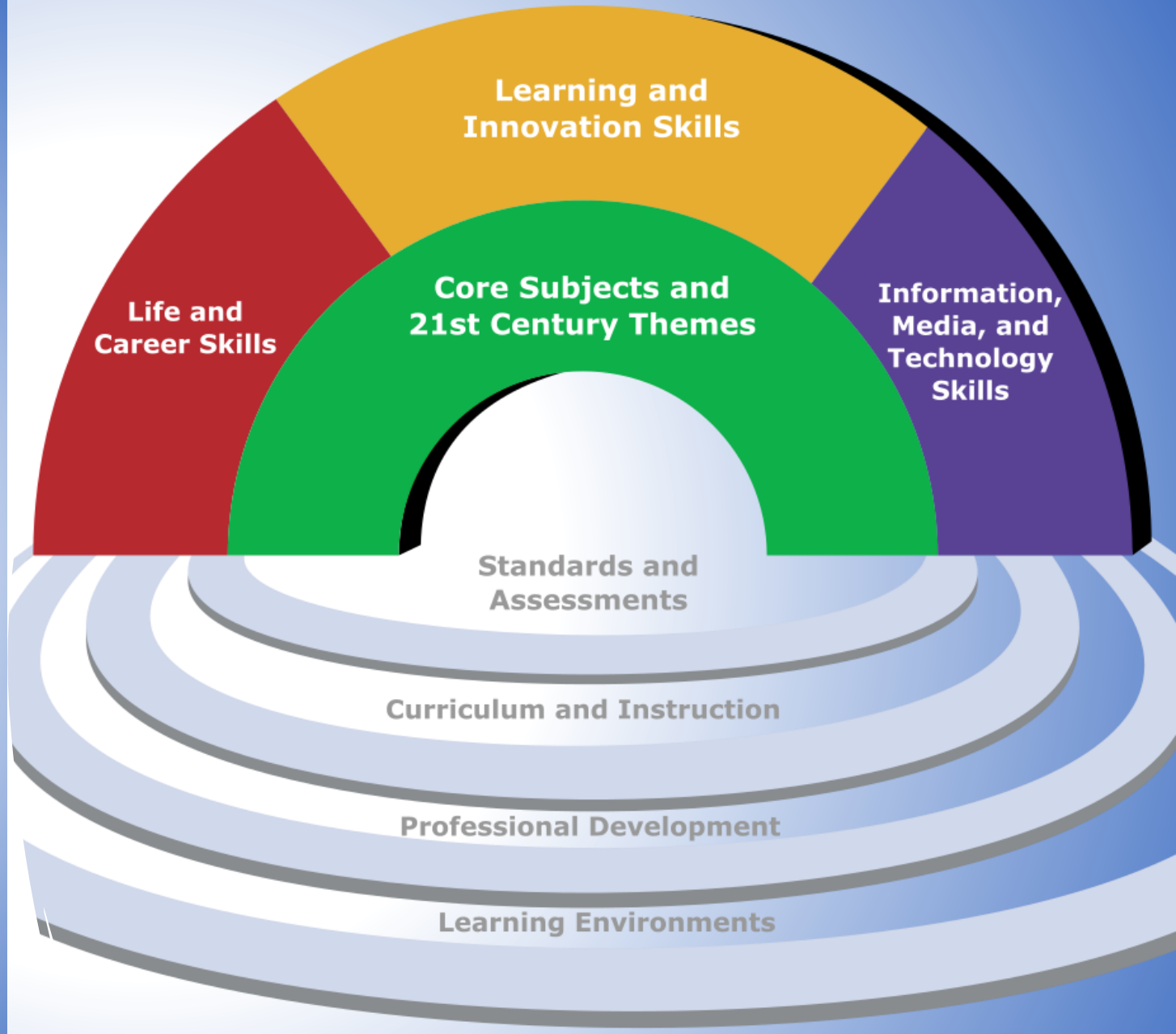
A focus on:

- ❑ **Communication**
- ❑ **Project Management**
- ❑ **Grant Acquisition and Fundraising**
- ❑ **How to commercialize your idea**

The nature of researchers' work in the 21st century

- In academia and the corporate sector, researchers need to be capable communicators, experts in project and research management as well as grant acquisition.
- They have to be able to commercialize their idea and manage stressful steps in their research.

Researchers needs now a robust transferable skills set.



re 1 - P21 Framework for 21st Century Learning

PhD:
an Academic and Professional Experience

Repackage **the PhD:** think it in terms of **transferable skills** developed in doctoral training.

The pool of skills -core competencies- shared by the majority of PhDs regardless of their discipline can be used in many contexts and helps them build a competitive professional profile.

PhD:
an academic and professional experience

The **PhD** is the **highest level of University education** awarded following the conduct of an original research project of at least 3 years, the writing of a thesis and its defence in front of a jury of experts. It constitutes **a professional experience.**

- **The potential of a PhD is often poorly understood by employers and PhDs themselves.**

- **To increase the employability of doctoral graduates it is vital to raise awareness of doctoral skills among doctoral graduates and employers.**


TRANSFERABLE SKILLS
a deeper insight
Benefits of a PhD

TRANSFERABLE SKILLS

- **Competencies acquired by Early Reserchers during their doctoral training and not necessarily related to research.**
- **Transferable skills are any skills that you have learned in one place that can be used in another.**
- **Transferable skills can be acquired in different contexts:**

holding lectures, supervising students, running workshop, family, social intercations, hobbies, volunteer work.

PhDs are invisible to employers, but they need PhD because of their

- ❑ **Ability to do research (collect and gather information)**
- ❑ **Information processing**
- ❑ **Ability to innovate, to be creative**

PhD task or activity	Skills/Competencies
☐ **I wrote a 50,000 word thesis.**	☐ **Ability to present and organize large amounts of information** in a clear manner.
☐ I had **3 supervisors.**	☐ **Negotiation skills**.
☐ I **analysed loads of data.**	☐ **Analysis of complex data** and presentation of emerging conclusions and concepts.
☐ I **conducted interviews** for my research project.	☐ Questionnaire design. **Experience in qualitative and/or quantitative analysis.** Sensitive to the needs of others. Diplomacy and confidentiality.

https://www.findaphd.com/advice/doing/phd-non-academic-careers.aspx

PhD task or activity	Skills/Competencies
☐ I **completed my PhD in three years.**	☐ **Ability to plan a project and deliver it to agreed timelines.**
☐ **I did a PhD**	☐ **Ability to work with minimum supervision as well as part of a team.**
☐ **Conferences**	☐ **Event planning skills**
☐ **Experiments or theory testing** didn't work but I found out why and tried again.	☐ **Problem-solving skills**

https://www.findaphd.com/advice/doing/phd-non-academic-careers.aspx

PhD task or activity

- [ ] **My research group was international or I spent some time abroad** for my research.
- [ ] I **took part in science communication or public engagement events** such as science festivals, visiting schools to explain your research, etc.
- [ ] I was **in charge of a piece of equipment** or I set up a research seminar series.
- [ ] **I am able to understand scientific journal articles.**

Skills/Competencies

- [ ] **Ability to interact with colleagues from diverse professional backgrounds** to successfully work towards common goals.
- [ ] **Ability to communicate effectively** to a wide range of audiences.
- [ ] **Initiative and self-reliance.**
- [ ] **Knowledke which can ben used in a job search.**

TEACHING SKILLS

- Designing, preparing and delivering lectures
- Facilitating small group seminars
- Addressing peers at conferences
- One to one tuition and coaching
- Providing feedback and assessment.
- Delivering training and lectures
- Identifying training needs for individuals and groups
- Designing training interventions involving external suppliers.

FUTURE SKILLS

2018	TRENDING 2022
Analytical thinking and innovation	Analytical thinking and innovation
Complex problem-solving	Complex problem-solving
Critical thinking and analysis	Critical thinking and analysis
Active learning and learning strategies	Active learning and learning strategies
Creativity, originality and initiative	Creativity, originality and initiative
Leadership and social influence	Leadership and social influence
Emotional intelligence	Emotional intelligence
Reasoning, problem-solving and ideation	Reasoning, problem-solving and ideation
Attention to detail, trustworthiness	*Technology design and programming*
Coordination and time management	*Systems analysis and evaluation*

WHAT ARE FUTURE SKILLS?

Skills that will become significantly more important for professional life and/or social participation in the next five years, across all industries.

- ❑ **Technological Skills**
- ❑ **Digital Citizenship Skills**
- ❑ **Classical Skills** (e.g. creativity, entrepreneurial action or stamina will become even more important in the future as the requirement profiles change rapidly)

Sources:

-MINDSET Project FUB Berlin

-Future of Jobs Survey 2018, World Economic Forum

FUTURE SKILLS

❑ Technological Skills

Digital skills that shape new professions; technological specialist knowledge; across all industries.

FUTURE SKILLS

❑ Digital Citizenship Skills

Digital skills that everyone needs in professional life and for participation in society in the future; this also includes digital literacy (handling complex amounts of data).

FUTURE SKILLS

❑ Classical Skills

Creativity, entrepreneurial action or stamina will become even more important in the future as the requirement profiles change rapidly.

DOCPRO ABG –Association B. Grégory, Paris
An Operational Tool to Track Skills

DocPro by ABG: a very helpful tool describing the 24 core competencies developed in the course of doctoral training and it helps:

a) *Recruiters* to gain better understanding of the potential afforded by doctoral training,

b) Heads of Doctoral Schools, PhD coordinators, career development facilitators at university to better prepare PhD students for the job market.

PhD-holders, recruiters and academic advisors can speak the same language.

ABG: specialized in recruiting and career development

http://www.mydocpro.org/en/about-docpro

How Doctoral Training Responds to the Demand of Labour Market.

The investment made to gain a PhD will not be lost. A PhD can be of great benefit for the wider community.

Project Management

A top skill sought after by companies

Complex projects need to be well planned and efficiently managed.

PhDs have managed research projects with limited budget While working in an academic lab, and this can be transferred to industry.

Team Work

An essential skill for today's job market

It is the necessary skill to engage in productive collaboration.

While working in academic research labs, and, therefore, they can gain experience in teamwork and collaboration.

Organizational Skills

Skills for Today's Job Market

Candidates will often be involved in multiple projects and it will be important to prioritize their various duties and designate adequate timelines to each of them.

Doctoral students are able to organize their work, from their schedule to complex projects.

Relationship Building

Skills for Today's Job Market

Build and maintain relationship, use diplomacy, give and receive constructive criticism, be tolerant and respectful, empathize with the others.

Developing an international perspective. Working with overseas colleagues is an added value: add information on how things are done in other countries.

Those interpersonal skills help build teams with a strong foundation of trust and accountability.

Emotional Intelligence/EI

A key ingredient in business environment

Emotional intelligence allows to produce positive results in difficult working environments.

Developing EI will help assess people, predict chances of a possible conflict, develop trust, and influence decision making in a professional manner.

Entrepreneurial Skills

They ecompass a number of things: commercial awareness, prioritisation, decision making, innovative and original thinking, strategic thinking, working independetly, communicating professionally.

These skills are sought after by employers in need of professionals able to come up with new ideas to improve processes.

Communication Skills

Skills for Today's Job Market

Communication skills are essential –when on top positions- in industry: professionals have to deliver presentations to explain new findings to decision makers. There is high demand for those who can translate scientific information into a message that can be understood by a broad range of both internal and external target audiences.

Skills in scientific writing, developed during the PhD, will be applicable to a series of responsibilities.

Some of academic activities, such as interacting with undergraduates through teaching, and delivering PowerPoint presentations for conferences or graduates, will be helpful in developing the transferable skill of oral communication.

Influencing and Negotiation Skills

Two Skills directly linked to the labour market needs

In most business situations we are expected to negotiate.

PhDs are constantly using negotiation skills while convincing dissertation committees about steps taken in a PhD research project.

They might have had to discuss the value of their research in a conference whose audience had a different point of view.

Adaptability and Flexibility

Skills for Today's Job Market

Employers tend to prefer candidates who are capable of improvising to find a unique solution to existing problem.

PhDs have to adapt to new challenges. It is also likely that PhDs dealt with multiple projects requiring different lab equipment.

Creative Problem-Solving

Skills for Today's Job Market

Companies hire the ones who are able to quickly solve problems. Candidate must be able to think laterally to find answers to pressing problems and formulate workable solutions.

The techniques developed through carrying out a research project and writing a thesis enable candidates to pick up new and complex concepts quickly.

Strategic Palnning

Skills for Today's Job Market

Ability to be strategic is very valuable, where success depends on long-term planning and the execution of complex innovation projects.

Science PhDs have the know-how to act upon information and plan multiple research projects based on constantly changing feedbacks.

Why are transferable skills important?

Transferable skills are incredibly valuable to employers. Not only do they show that you'd be a good fit for the team, they can also demonstrate what a candidate can bring to a role, and how much they've learnt from previous positions or experiences.

WHICH COMPETENCIES, ACQUIRED DURING YOUR POSTDOC, DO YOU USE IN YOUR CURRENT JOB?

- **Specialised academic skills.** ***Research and analysis – they are part of my core offering to clients.***
- **Get to the real problem fast.** ***My experience as a PhD supervisor has taught me to identify the real issues that clients need to address***
- **Communication skills:** ***Teaching has given me the ability to convey complex methods and perspectives clearly to a non-specialist audience***
- **‘Out-of-the-box’ thinking:** ***Basic research has taught me to dig deeper and see things from a different perspective. This is particularly useful when clients come to me with complex issues.***

What's your value proposition? Work out what kind of value you could bring to an organisation – based on your specialist knowledge and your experience in managing complex research processes.

Network. Connect with organisations and companies that work in a field you're interested in. Reach out to them and set up meetings. This is the only way to get a real sense of what they do, how they work, and how you might be of value to them

Consider self-employment. If you decide to set up your own business, get the right support from the start.

WHICH COMPETENCIES, ACQUIRED DURING YOUR POSTDOC, DO YOU USE IN YOUR CURRENT JOB?

Which competencies, acquired during your postdoc, do you use in your current job?

- **Core science competencies:** ***Research, analytical skills and especially time management are fundamental to the work I do.***
- **Build a strong network:** ***Your knowledge is valuable to companies; but so is your network. Nurture your contacts and expand your network as much as you can.***
- **Be a team player: To work in an organisation –large or small, public or private – you need to be good at teamwork.** *The organisation is not looking for lone riders; they are looking for team players who are open, constructive, and able to work towards a common goal.*

Which competencies, acquired during your postdoc, do you use in your current job?

- **Time management**: *tight deadlines and impromptu tasks require flexible time resources – make sure you can prioritize and often also delegate tasks well.*
- **Writing skills:** *Writing articles, reviewing papers have taught you to write clear and compelling texts.*
- **Applying for funding:** *Having applied for a number of postdoc fellowships, you know what makes a good proposal.*
- **Organisational skills:** *As a postdoc you organized conferences, seminar series, outreach activities, fieldwork trips, etc. These experiences have given the confidence and organizational skills to coordinate various types of activities at the faculty.*

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Which competencies, acquired during your postdoc, do you use in your current job?

- **Complex thinking**. ***At times, my job involves fairly complex conceptual work. This can be very demanding intellectually and calls for good analytical skills.***
- **Career planning is a work in progress.** ***Planning what you want to do after your postdoc takes time.***
- **Think carefully about what you like and don't like in your current line of work.** ***Consider what you enjoy – and what you miss – in your current professional life and look for professions that match your preferences. So don't leave this to the very end of your postdoc tenure.***
- **Check out job listings for inspiration**. ***Have an open mind when it comes to industries and professions. You might be surprised to see where the interesting opportunities can be found and where your qualifications can take you.***

Which competencies, acquired during your postdoc, do you use in your current job?

- **Core science competencies.** *Thinking analytically and being curious are fundamental prerequisites to the work I do as a scientist.*
- **Go abroad.** *If you wish to stay in research, apply for a position at one of the best universities in your field. Stay there until you have consolidated your competencies. Remember to maintain your network whilst you're away – for example, by returning home to give research talks and seminars.*
- **Work with people that are smarter than you.** *Learn how they think and act, and prepare yourself for your future career –*

TRANSFERABLE SKILLS acquired in other contexts

In my military career I coordinated the training and deployment of over 250 personnel to operations abroad.

- ❑ **Team leadership**
- ❑ **Project management**
- ❑ **Resource management**
- ❑ **Resilience**

SKILLS ARE AT THE HEART OF THE HIRING PROCESS

Establishing a common vocabulary between Doctoral Graduates and companies that could hire them.

A Skills-Based Approach to the Labour Market

- Degrees are often outdated by the time they are obtained.

- Rapid technological change, digitalization, raising degrees of work complexity are transforming the labour market.

Emergence of new kinds of jobs.

A Skills-Based Approach to the Labour Market

- **Skills play an important role in private and public sectors. They are the new «currency» for the labour market** *(World Economic Forum).*
- **Soft skills are in great demand now:**

combination of personality traits, behavior and social attitudes.

A Skills-Based Approach to the Labour Market

SOFT SKILLS

You can take them with you anywhere in the company and outside it.

Power skills, durable skills, human skills

- **Creativity**
- **Time management**
- **Adaptabilty to rapid advancements in technology,**
- **Leadership**
- **Problem-solving**

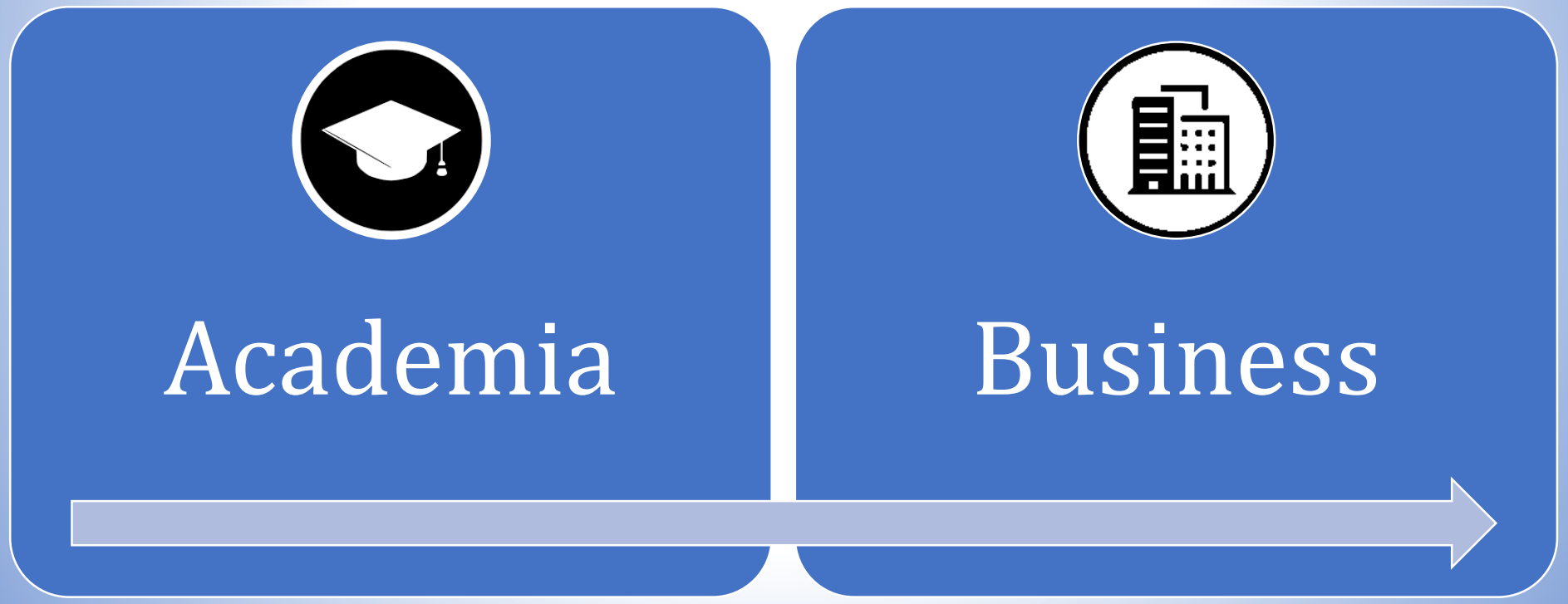
Those skills allow people to collaborate, communicate effectively and successfully manage conflicts.

What Employers are in need of

Employers are usually looking for abilities and qualities that they recognise to be present in the most effective employees. These soft skills, such as being able to communicate effectively in a variety of situations, showing initiative, creativity and integrity, and having a good work attitude, are valuable across all industries.

TRANSLATING SKILLS DEVELOPED DURING A PhD

Academia and Business may seem poles apart but you may be surprised at how portable skills developed in doctoral training are.



The Most Needed Transferable Skills

- **Employability arises from a number of competencies.**

- **Employers seek for a mix of intellectual, social and organizational skills.**

The Most Needed Transferable Skills

- ❑ PROJECT MANAGEMENT
- ❑ COMMUNICATION SKILLS
- ❑ ENTREPRENEURIAL THINKING
- ❑ RELATIONSHIP BUILDING
- ❑ ORGANIZATIONAL SKILLS
- ❑ PROFESSIONAL DEVELOPMENT
- ❑ CLIENT-FACING SKILLS
- ❑ TEAM WORK
- ❑ NEGOTIATING SKILLS
- ❑ LEGAL AND REGULATORY ASPECTS
- ❑ LEADERSHIP SKILLS
- ❑ CREATIVE THINKING
- ❑ COLLABORATION
- ❑ COMMERCIAL AWARENESS
- ❑ STRATEGIC PLANNING
- ❑ PROBLEM SOLVING
- ❑ ADAPTABILITY AND FLEXIBILITY

EMPLOYERS WANT EMPLOYEES WITH
What competencies are important to the organizational culture?

- Problem solving
- Technical/subject expertise
- Creativity
- Collaboration
- Communication
- Innovation
- Research skills
- Emotional intelligence
- Project management
- Self-organization
- Strategic thinking
- Leadership
- Adaptability
- Self-organization
- Take decisions

WHAT KIND OF JOBS ARE AVAILABLE TO RESEARCHERS OUTSIDE OF ACADEMIA?

- **Research for external bodies**
- **Function Manager –e.g. Production Manager, HR Manager, Business Development Manager**
- **Research/ Science policy manager or developer**
- **Public Science Engagement**
- **Health professional**
- **Teaching**
- **Private Tutoring for individuals and groups and Guest Lecturing**
- **Consultancy**
- **ICT**
- **Engineering professional**
- **External Examination setting and Assessment (for professional bodies as well as academic boards)**
- **Journalist or media professional**
- **Law professional**
- **Training and Development**
- **Academic Publishing** (including writing school and undergraduate textbooks)

Future Skills: Most Seeked Top Professional Profiles

- **Industry Career Application Scientist**
- **Quantitative Analyst**
- **Science Public Policy Advisor**
- **Product Manager**
- **Clinical Trials Project Manager**
- **Competitive Intelligence Analyst**
- **Business Development Manager**
- **Intellectual Property Lawyer**

Future Skills: most seeked top professional profiles

- **Technical Sales Specialist**. Teaching and Presentation Skills are essential in this case.
- **Medical Science Liaison**. Relevant scientific knowledge is required for this position.
- **Research Analyst in Venture Capital**
- **Market Research Analyst**
- **Technology Transfer Officer**
- **Climate Change Expert**
- **Digital Forensic Expert**
- **Science Editor**
- **Corporate Entrepreneur**

Careers in Medical Communication

- **Medical writer is a communication profession, accessible to people with a solid scientific background. It is a "natural" option for PhDs interested in a career far from research. Participating as exhibitor in medical congresses or during the meeting of patients associations, monitoring information….**
- **<u>Required skills</u>:** to enjoy writing and communicating in English, and to be very rigorous.

Original Jobs for PhDs

Alumni Project, University of Torino

- **Science Communication:** science popularization, graphic design, event management, communication.
- **Research Grant Manager:** dealing with communication activities and the design of management tools for researchers.
- **Science Editor:** education specialists (High school textbook)
- **Digital Forensic Expert**
- **Museum Manager**

Original jobs for PhDs

Business development manager

You have to strategically devise a plan. Companies need your for your ability to learn quickly technical skills and to translate them into business data.

Original jobs for PhDs

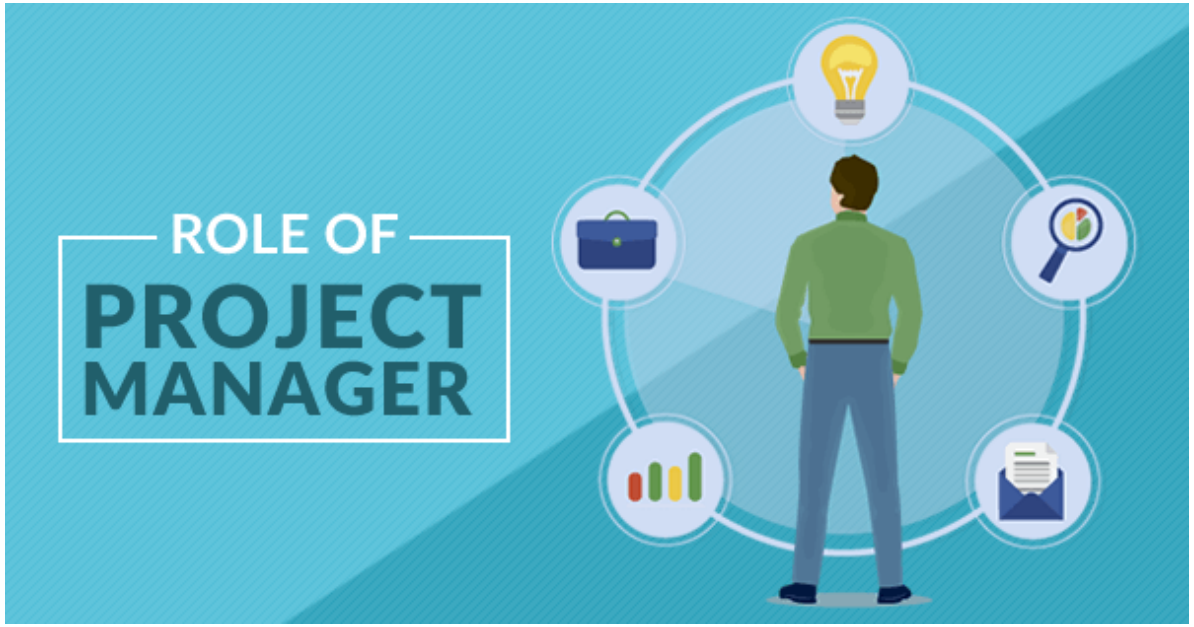
Contract research associate

You have to speak the language of the industry, of clinical trials. You cannot use academic terms. They use different terms in industry.

Original jobs for PhDs

Project manager

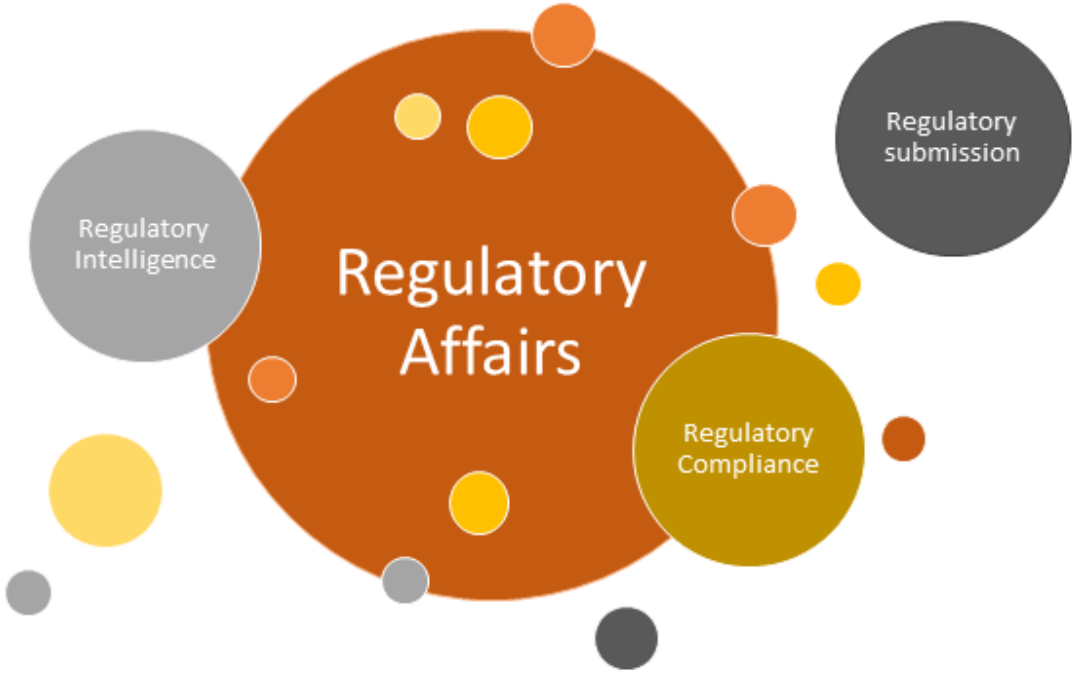
Companies need PhDs because they are highly organized and able to work remotely.



Original Jobs for PhDs

Regulatory Affairs

Companies need people who can read regulatory documents and to make sure that company is following regulations.



Original Jobs for PhDs

Medical science liaison

Even more popular now. PhDs are able to learn quickly information, to coordinate. They have to speak the language of this field.

Original Jobs for PhDs

Data scientist

Ability to communicate technical data and turn them into business data. Yu have to deal with investors,technical execuitves etc.

For the following jobs PhD is not necessarily a prerequisite, but most definitely an asset.

Communication skills

Climate change, medical care, advanced technologies like artificial intelligence…..

Science has very important things to say about some of the biggest problems society faces. Scientists can no longer stay on the sidelines in these important public debates.

Communication skills

Scientists need to learn to tell their own stories because society needs their expertise, their perspective, their evidence-based problem solving skills for the future.

Communicating Science

Researchers are in need of the necessary knowledge and skills to communicate their research to the wider public.

Researchers need to know how to publish their research in newspapers to reach non-academic audiences and to be familiarized with social media channels such as Twitter, which can serve as a tool for communicating research ideas and findings.

Communication skills

- In an increasingly competitive and global market, researchers and the institutions they represent need to communicate their research to an international audience.
- Researchers need the communication skills to enable them to publish in international journals and present at conferences in English; apply for funding to national and international bodies; communicate with a wider audience.

Communication skills

- **Without the skills to do this, researchers and research institutions can find themselves at a competitive disadvantage, affecting grant income, international presence and reputation.**

Communication Skills

Researchers need to

- ❑ **communicate their paper or abstract effectively whatever the situation or context,**
- ❑ **become both critical readers and writers of abstracts through review,**
- ❑ **write successful proposals (clear, concise etc.). The insight and techniques gained are highly transferable to other professional situations such as pitching to investors, networking and even for interviews,**
- ❑ **give clear, effective and relevant (to the audience) presentations about aspects of their research.**

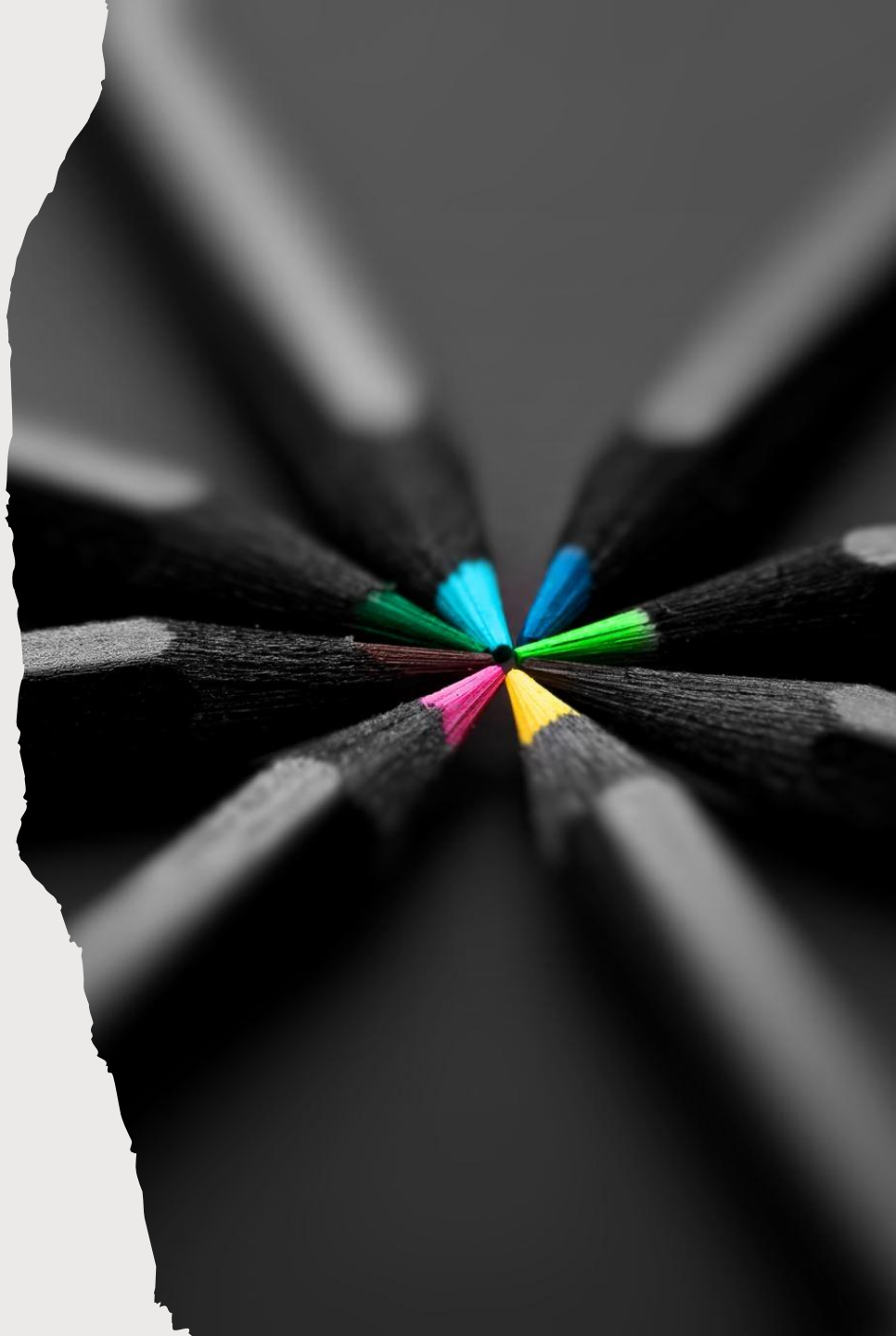
Communication skills

Often great ideas cannot be communicated because of poor content structure, lack of confidence, and weak vocal delivery. **Articulate research to a diverse audience is not so easy**. Researchers need to deliver their message with credibility, persuasiveness, and impact.

The British Council has developed the ***Researcher Connect professional development course***. Training Packed with techniques and practical exercises based on the very latest developments from the psychology of communication, vocal performance, linguistic, emotional intelligence, and successful influence strategies.

WRITING SKILLS

- Directing your research
- Introduction to research articles
- Literature reviews
- Peer reviews



PROJECT MANAGEMENT

Managing research with confidence

Organising your work more effectively and with less stress to become successful leaders or members of research projects.

Project management is an integral skill for everyone, especially those in the research community, whether they're researchers or clinicians or managing a lab.

PROJECT MANAGMENT

You need guidelines to follow in order to ensure that your project is properly set up to get off to a good start.

Project management tools for researchers

Having been successful in attracting funding for your project, you will now have to lead it from set-up to completion. The following pages take you through the key stages:

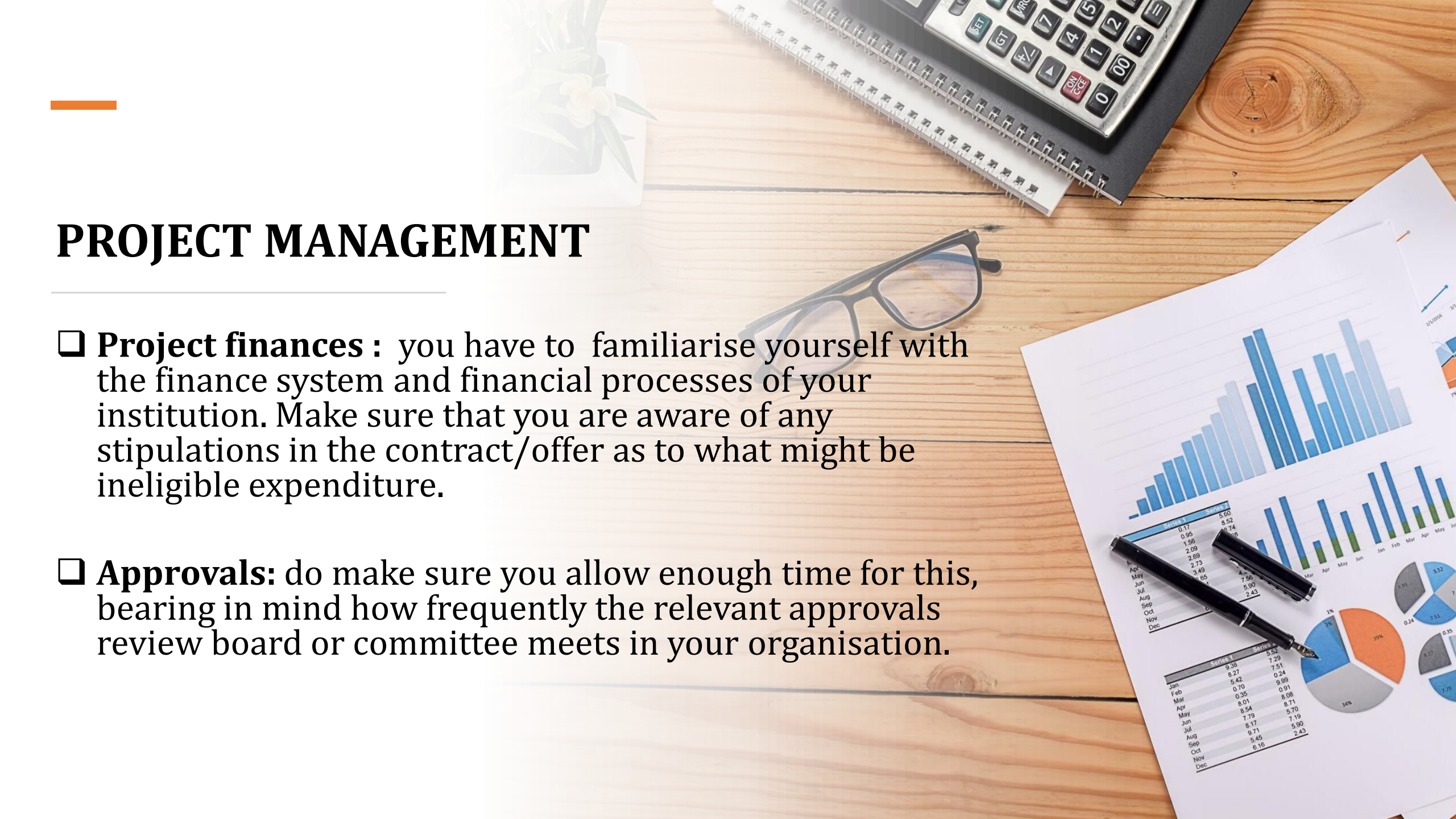
- Setting up a research project
- Monitoring a research project
- Reporting on your research project
- Making the most of your research project

https://www.vitae.ac.uk

PROJECT MANAGEMENT

- **Project finances :** you have to familiarise yourself with the finance system and financial processes of your institution. Make sure that you are aware of any stipulations in the contract/offer as to what might be ineligible expenditure.

- **Approvals:** do make sure you allow enough time for this, bearing in mind how frequently the relevant approvals review board or committee meets in your organisation.



PROJECT MANAGEMENT

- **Staff recruitment** liaise with your Personnel or Human Resources department, who will manage the process for you. You are likely to be responsible for providing all the details of the posts you are offering.

- **Legal conditions:** you should ensure that you review the contract/terms and conditions of the grant before you start.

PROJECT MANAGEMENT

Monitoring a research project

- ❑ Monitoring timescales
- ❑ Monitoring finances

Periodic reports

The funders of your research, and the institution at which you are carrying out your research will both want to be informed at regular intervals about the progress of your project.

The final report

At the end of the project you will almost certainly have to produce a final expenditure statement and a final report. Your research office may complete the former for you, but you do have overall responsibility for the accuracy of both reports.

Records

At the end of your project you will need to make sure that your records are complete and in order. It is possible that your project could be subject to audit at some stage in the following few years and having a complete set of records at this stage could save a great deal of time later.

GRANT ACQUISITION

- **Improving subsidy proposals and increasing rate success**
- **Providing an overview and advice on subsidies and grants that match the proposed research or career profile**

-General grant schemes,

-the writing life-cycle,

-writing tips, legal aspects (IP management),

-the evaluation process

SciLink https://scilink.eu/

GRANT ACQUISITION

Learning about the principles of developing multi-disciplinary collaborative research projects.

More and more researchers need to raise money for their research projects. But where to find funding bodies and how to convince them?

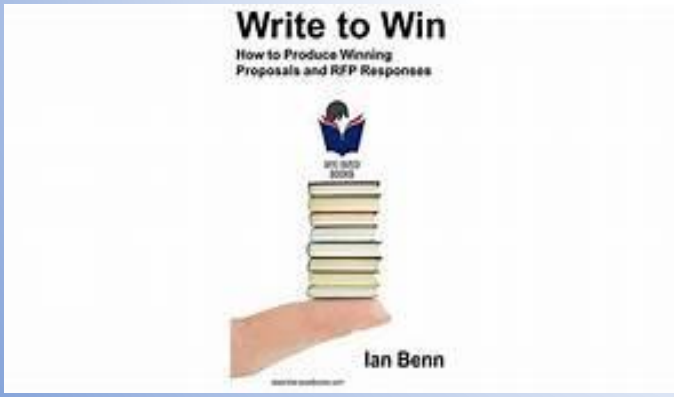
How to put a winning proposal together?

How to approach the preparation of a proposal effectively? particularly focussing on collaborative projects.

GRANT ACQUISITION

Horizon Europe, the European Union's Framework Programme for Research & offers a multitude of opportunities, but also poses many challenges. The skills acquired are transferable to other types of programmes supporting research.

GRANT ACQUISITION



Providing researchers with a good understanding of:

Strategic aspects:

- an introduction into funding opportunities and into Horizon Europe;
- what information, documents are essential and helpful;

- the structure of proposals and how to organise the proposal preparation to make the process efficient;
- how to produce a convincing case, particularly on impact;
- financing and budgeting;
- success factors and typical failures.

FUNDRAISING

for University research projects

Having a clear idea of how to make research projects sustainable means taking a look towards the future.

Fundraising, as a set of techniques and approaches aimed at ensuring the sustainability of initiatives and projects, is increasingly assuming an important role within the corpus of intersectional skills necessary to pursue medium-long term objectives.

FUNDRAISING for University research projects

- **Sometimes fundraising is often reduced to its "funding" dimension. However, a correct comprehension of a fundraising-oriented approach is pivotal to address the issue of the future from a concrete, practical point of view, linked to the economic side but also to relationships and networking, stakeholders analysis, communication strategy, initiatives to raise awareness linked to the projects themselves.**

Acquiring fundraising skills thus becomes, in a complex world where intersectionality and integration are keywords, a driver for defining a professional path in the round.

Fundraising

Example of theoretical-practical training modules

4-hour workshop

Trainer: Simona Biancu

Engagedin
https://www.engagedin.net

Through in-depth study aimed at understanding:

- **What does fundraising mean,**
- **which skills are required to properly fundraise,**
- **how to identify fundraising objectives and goals,**
- **how and where to look for donors and retain/cultivate them,**
- **how to set up a multi-target and multi-vehicle fundraising campaign (including crowdfunding initiatives),**
- **how to define an operational plan to raise funds,**
- **practical cases will be analyzed** - also proposed by the participants - and useful ideas will be provided for the launch of a fundraising campaign connected to the university world.

RESEARCH, BUSINESS, ENTREPRENEURSHIP, AND MANAGEMENT

How to commercialize your idea

Entreprenuerial capacity building

- How to start and manage an innovative business.
- How to identify an entreprenuerial idea, make it profitable, start a business and deliver a successful product

Commercialize innovation Academia-Industry

- Understand the “noise” in the system.
- Run a *divergent* innovation session.
- Hold a *convergent* innovation session
- Build a works-like prototype.
- Develop a looks-like prototype
- Combine into a full prototype
- Start scaling.
- Conduct a soft launch.

DISRUPTIVE INNOVATION

Technical innovation is hardly disruptive and it is brought about by solving new problems with existing capabilities. Researchers have the competencies and skills to be disruptively innovative with no need to discover and develop new technologies.

Researchers have to know how to develop new business models to disrupt the marketplace.

Disruptive innovation **refers to a concept, product, or a service that either disrupts an existing market or creates a completely new market segment.**

Connecting people, ideas and resources

Good practices.

A new approach to the topic

- **IP&D - Innovation, Projects and Development Ltd was established in 2003 by Dr. Isser Peer with a vision of connecting people, ideas and resources based on expertise in the creation of start-ups, spin-offs, and licensing to strategic companies, focusing on the interface between Academia and Industry.**

Connecting people, ideas and resources

Good practices

IP&D engages in research support and projects including **Technology Transfer and entrepreneurship,** organizing international training and workshops, knowledge management, IPR consultation, and acquisition of soft skills. Recent events IPD has implemented include a Career Fair and Entrepreneur Workshops in collaboration with the Weizmann Institute of Science, and the Technion Institute of Technology.

Connecting people, ideas and resources

Good practices

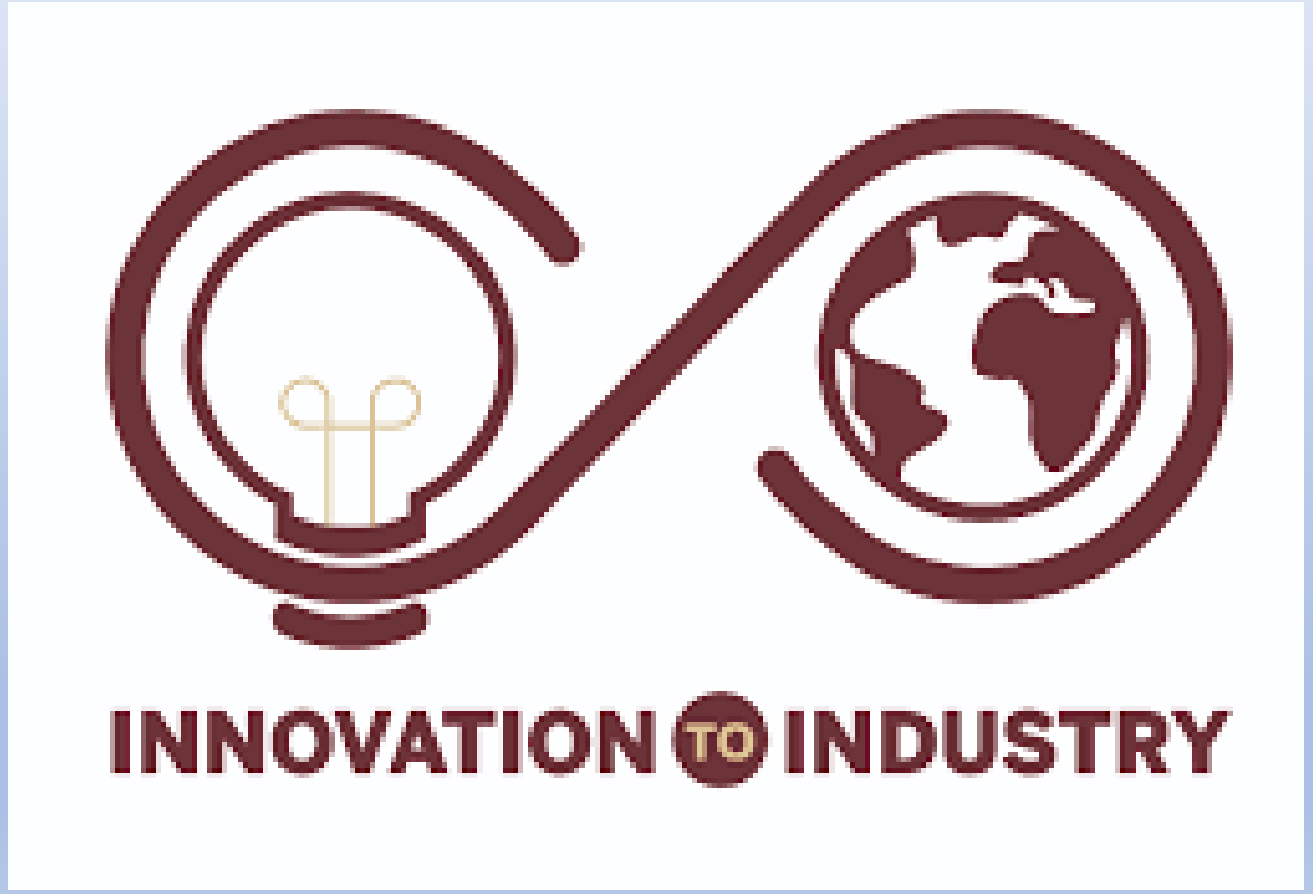
IP&D

Dr. Isser Peer - is a Technology Transfer and entrepreneurship expert whose areas of expertise are the exploitation of Intellectual Property Rights and the creation of start-ups, spin-offs and licensing to strategic companies. Peer was the CEO of BIRAD, the Technology Transfer Company of BIU and directed the Research Authority, Bar-Ilan University. In 2003, Peer **founded IP&D Ltd, a private company based in Israel, with the vision of "Connecting People, Ideas and Resources".**

Technology transfer: defining research commercialization

Research Commercialization

In order for university-based knowledge to make it out of the laboratory, individual scientist-inventors need to take part in the commercialization process. This commercialization process, which is sometimes called "academic entrepreneurship," can be hard for scientists. They were trained and socialized as scholars and usually see themselves that way. The business world can appear alien, daunting and unconnected to the research world.



Research commercialization allows technology created during research activities to be further developed into marketable products for the benefit of the public. This is achieved through technology transfer. *Technology transfer often refers to transferring a technology between a research laboratory and a commercial partner, including industry, academia, and state and local governments.*

Technology is typically transferred through a license agreement in which the university retains ownership of the intellectual property created during research activities, while the industrial partner obtains conditional rights to use and develop a technology.

Intellectual property may be protected using *patents, copyrights, trademarks, and trade secrets*. The rights to an article of intellectual property may be bought, sold, leased, rented, or transferred between parties. Additionally, the transfer of intellectual property rights can affect a product's marketability.

Intellectual property is an essential component **when evaluating an invention's commercialization potential.**

To ensure that the intellectual property is appropriately protected, researchers are highly encouraged to first disclose their discovery to their institution's technology transfer office before sharing the invention with people outside the university.

Universities are operating a so called Tech Transfer Office, but unfortunately, they are often performing badly as people in charge don't have a business background and lack of passion to help commercialize research results. They are the cause that a lot of IP is wasted nowadays.

Promoting cooperation between industry, universities and research institutes, connecting scientific research, education, and industry, coupling technological innovation in the midstream and downstream…..

Encouraging more scientists and researchers to become more entrepreneurial

- Organize informal gatherings to discuss the possibilities from commercializing scientific research and get scientists comfortable with it. Bring in representatives from established companies to encourages scientists to come up with a solution to a problem and helps them see the possibilities. Then give the scientists time to discuss the ideas among themselves.

Encouraging more scientists and researchers to become more entrepreneurial

- Help scientists visualize how they can contribute to commercializing an innovation in a role that makes them comfortable and plays to their strengths as scientists, such as Chief Scientific Officer.

- Encourage them to take risks, without fear of failing, and to share their stories so that they can learn from one another.

The Researcher Entrepreneur

Best practices for successful technological entrepreneurship, G. Vekinis

Any good scientific researcher has both the capacity and most of the critical skills necessary to become a good entrepreneur. What is needed is a different outlook!

Many of the skills that researchers have are almost directly applicable and valuable in a start-up entreprise

The Researcher Entreprenuer

Best practices for successuful technological entrepreneurship, G. Vekinis

*«You, as **inventor researcher**, offer the vision and the scientific and technological foundations but the day-to-day operations in the company will be carried out by **skilled workers**, each offering their expertise in their specific area.»*

«Both **good researchers take the initiative and are good innovators**. The level of innovativeness in both worlds are the same, but the **outlook** and the **view point are different**: researchers prepare the inventions which are then taken over by entrepreneurs to turn them into valuable innovations.»

The Researcher Entreprenuer

Why PhDs are potential entrepreneurs?

As an entrepreneur, a Ph.D. Candidate must truly believe in his thesis (idea). To achieve successfully your dissertation, you need to be intrinsically motivated towards your research problem. You need to be confident about your skills for fulfilling the thesis requirements and you have to be extremely optimist about the outcomes of your research.

Intrinsic Motivation

Being a Ph.D. means not having any boss. Yes, you have your supervisor and the scientific committee board that guides you and evaluates your progress, but no one will be there to tell you what to do, and what it's more no one will tell you how to do it. You are on your own to figure out the business plan, set your agenda and milestones

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DEVELOPING SKILLS
Professional Development

HOW TO DEVELOP NEW SKILLS

- **Observing other people** in a company excelling in soft skills.
- **Taking on more responsibilities** at work.
- Taking on-line **soft skills courses**.
- **Extra curricular activities** enable PhDs to develop their network and it is appreciated by recruiters.
- **Non professional experience** enable PhDs to gain skills.
- **Writing a blog** demonstrates writing skills.

HOW TO DEVELOP NEW SKILLS

- **Join a society could give them experiences in team work, planning meetings, hosting seminars.**
- **Departmental opportunities: PhDs could be a tutor or lab demonstrator.**
- **Volunteering**
- **Public outreach: to communicate their work to the general public** . This could include university festivals and open day programmes.

HOW TO DEVELOP NEW SKILLS

- **A chat with your university career service**, or **postgrad/early career research support team.**
- **Networking:** reach out to people who may be able to help them, **friends, mentors, supervisors or colleagues**
- **Planning any symposiums or events within the department. This shows great initiative.**

TEN BEST WEBSITES FOR SELF-IMPROVEMENT

- **COURSERA** https://www.coursera.org/
- **KOUDETAT** 40 Hours video on entrepreneurship. A must to develop your entrepeneurial culture**.** Free of charge http://www.koudetatondemand.co/
- **CODEACADEMY** https://www.codecademy.com/
- **DATAMONKEY about big data** http://datamonkey.pro/
- **HOOTSHUTTLE ACADEMY about social media marketing, social network** https://education.hootsuite.com/collections?category=courses

TEN BEST WEBSITES FOR YOUR SELF-IMPROVEMENT

- **KOOBER digital skills** https://discover.koober.com/us
- **HIGHBROW 5 min. a day (computer science, psychology)** https://gohighbrow.com/
- **DIGITAL ACTIVE PARGOOGLE Digital Marketing** https://learndigital.withgoogle.com/ateliersnumeriques
- **GUIDES Crowdsourcing** https://guides.co/
- **LIFEHACKER** https://lifehacker.com/

Developing yourself as a PI

Meaningful development does take up some time and effort, so it is really in your own interest to invest in some personal reflection and self-analysis to get a clear idea of what your needs and aims are.

- **Reflection**

Reflect on your performance and your previous experiences and capture the learning and development that you gain from them.

Self analysis

- identify existing knowledge, behaviour and attitudes
- identify core strengths
- evidence your abilities and identify gaps.

Developing yourself as a PI

What next?

- **Opportunity awareness**: gain a wider knowledge of the academic sector to identify, create, investigate and seize areas for personal and professional development. Identify possible sources of information and support within your institution
- **Decision making**: understand your personal priorities and constraints (internal and external), so that each developmental opportunity and career step can be made following an informed decision.
- **Networking**: develop networks of contacts. You should be able to define, develop and maintain a support network for advice and information.

Developing yourself as a PI

What next?

- **Self presentation and promotion**: define and promote your own agenda. Promote your own strengths in a convincing way
- **Goal setting and action planning**: move your career forward in a structured way through planning and implementing an effective course of action, organising time effectively and preparing contingency plans. You should be able to monitor and evaluate progress against specific objectives.

ACHIEVING SUCCESS WITH LESS STRESS

- Personal well-being
- Self-care
- Exploring your own personal challenges
- Building self-confidence

SciLink Foundation is offering online courses

https://scilink.eu/

Skills Training and Mentoring - For Researchers –

Providing skills to early stage and experienced researchers through high quality workshops, mental health management, and mentoring.

How to manage stress

Take a break!

Overworking is counterproductive overworking at stage is counterproductive. Apart from physical from exhaustion, it exhausts your mind and spirit too.

Constant overworking is a sign that something needs to change in your PhD life. Not taking break and of-time will affect your health negatively and, as hard as a PhD is, I'm sure it is much harder to do it when your body isn't playing along.

https://phdlife.warwick.ac.uk/2016/04/13/take-a-break-its-ok/

How to manage stress

Space for thinking, fun and support

Research is about solving problems and finding answers. Inevitably, this means dealing with the problems and, often, feeling like you've come to a dead end. Focusing all your energy and wake hours to overcome a single obstacle might not be the effective solution. Taking a few. After a break, especially a longer one, our brain is refreshed too, and we will be more likely to find new answers

How to manage stress

Putting things into perspective

Talking to people whose everyday vocabulary doesn't include words like *dissertation, article, variables and study participants* might help. People and activities unrelated to academia help us remember there is a whole world out there, a world where PhD is basically a long essay with an exam in the end.

Mindfulness means maintaining a moment-by-moment awareness of our thoughts, feelings, bodily sensations, and surrounding environment, through a gentle, nurturing lens. Mindfulness also involves acceptance, meaning that we pay attention to our thoughts and feelings without judging them—without believing, for instance, that there's a "right" or "wrong" way to think or feel in a given ...

MINDFULNESS

https://www.headspace.com/

Meditation and mindfulness for any mind, any mood, any goal

- In an uncertain world, we all search for ways to stay grounded. But when the mind gets fixated on worry — a natural response to uncertainty — it can feel hard to find your footing.
- Most thoughts, emotions, and anxiousness caused by worry are negative, imagining worst-case scenarios, anticipated threats, or scenarios that reflect our own lack of self-worth.
- For instance, the worry could be that someone we're meeting won't like us. Most of the time, our worries don't pan out. Eventually, we come to realize that worrying about the future doesn't prevent tomorrow's troubles, it just robs today of its joy.

MINDFULNESS

https://www.headspace.com/

- **Mediation** can be a great ally. With practice, we learn to step away from the thoughts and emotions that entertain worst-case scenarios; instead, we develop an **awareness** that allows us to not only see what our mind is inventing, but to also be less triggered by worry.

- We are essentially training the mind to be calmer, more at ease, and less reactive. By simply watching the mind, we can start to feel more at ease with our feelings and begin to ease the emotions and physical sensations that may arise when we worry.

MINDFULNESS

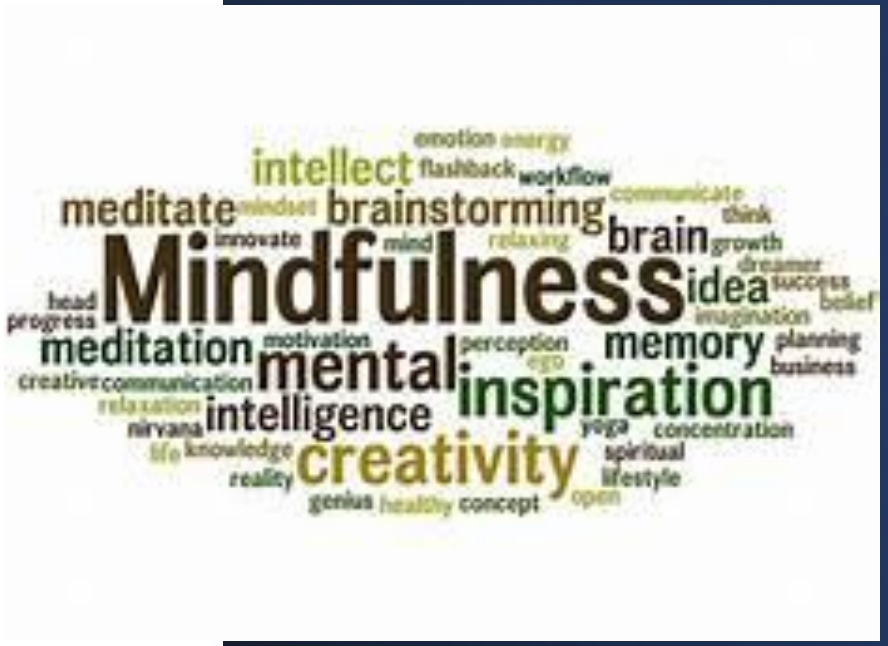
- Research shows that mindfulness training can reduce anxiety for those with anxiety disorders.
- Meditation isn't about pushing worries away, clearing the mind, or stopping thought — that's not possible. But over time, we can train the mind to observe our thoughts and emotions without getting caught up in them.

5 ways to stop worrying about everything, or at least how to worry less

1. **Schedule “worry time” on your calendar.**
2. **Practice meditation.** Another **skill** for learning how to stop worrying about the future — or obsessing about the past — is a regular meditation practice.
3. **Learn to distinguish between solvable and unsolvable worries.**
4. **Write down your worries.**
5. **Write down what you’re grateful for.**

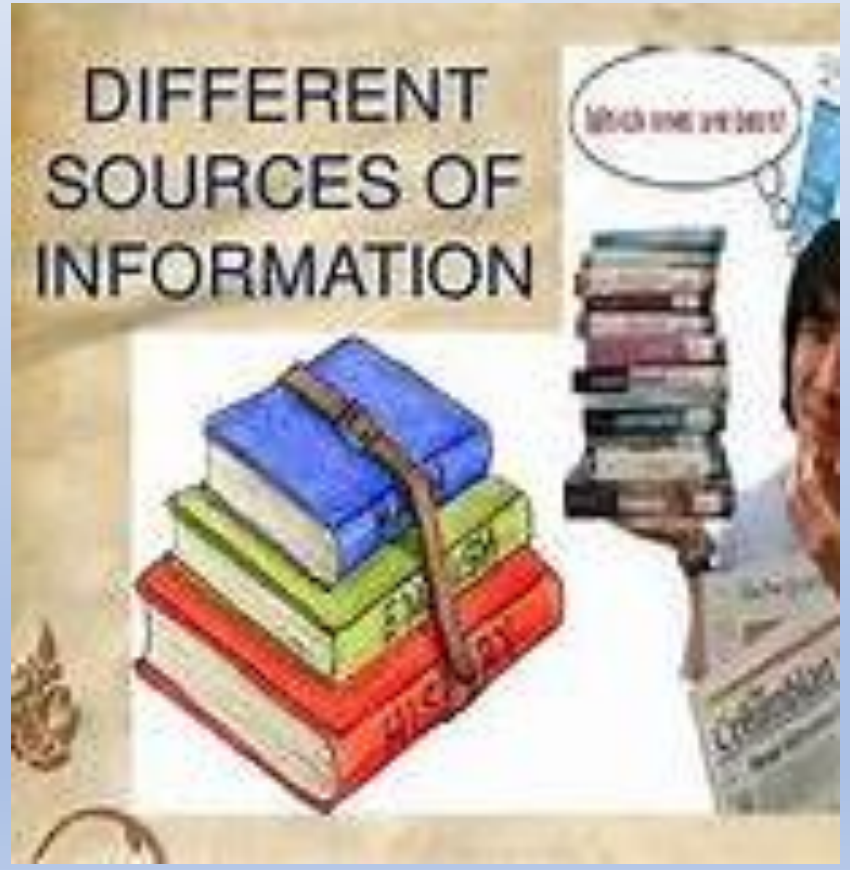
HOW TO MANAGE STRESS

There are many science-backed relaxation techniques (deep breathing, meditation, progressive muscle relaxation, yoga, tai chi, massage, getting outdoors, or just doing things you enjoy!) that counter feelings of anxiety and stress. Incorporating them into your daily life can promote a calmer frame of mind, and help ward off worry. We just might find that we spend a lot less time feeling uncertain and concerned about what lies ahead.



Overview of Information and Resources

- EURODOC (*European Council for Doctoral Candidates*) Skills Report von Eurodoc, "Identifying and Documenting Transferable Skills and Competences to Enhance Early Career Researchers Employability and Competitiveness"
- ABG has also recently published a very interesting work on transferable skills in the form of interviews conducted to PhD Graduates regarded as "successful Career Transition stories" https://www.abg.asso.fr/en/vue/career-paths-and-professions
- DOCPRO, ABG
- Future and transferable skills are the focus of MINDSET PROJECT, Technical University of Berlin



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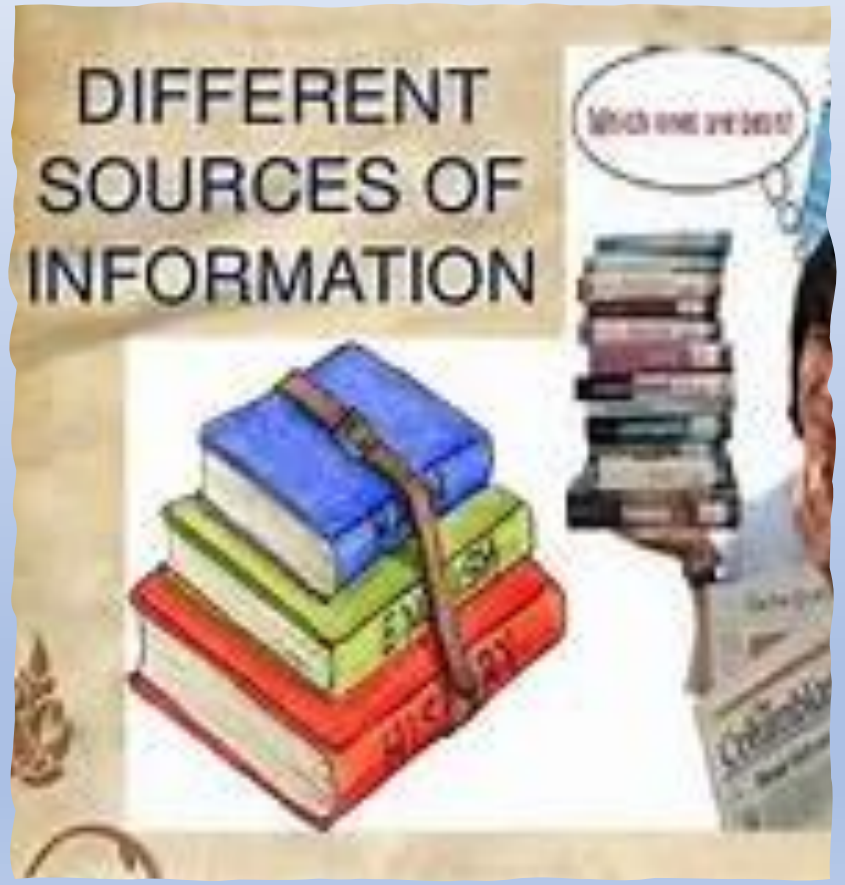


- EUA/CDE is regularly publishing documents on this topic.
- ADOC Talent Management, "The Core Competences of PhD" by B. Durette, M. Fournier, M. Lafon
- OECD, *Transferable Skills Training for Researchers*
- VITAE UK provides relevant information on this topic
  Vitae Research Development Framework
- "The Researcher Entreprenuer. Best practices for successful technological entrepreneurship" by George Vekinis.
- Cheeky Scientist Association

Overview of Information and Resources

- Why is it not a 'failure' to leave academia ? https://www.nature.com/articles/d41586-018-05838-y
- PhD Competencies and Employment Trends in Canada https://static.wixstatic.com/ugd/c19fb8_4778cc1555784d3a965195ba18de8b73.pdf
- How to Improve your CV while on your PhD https://phdlife.warwick.ac.uk/2016/01/13/how-to-improve-your-cv-while-on-your-phd/
- Ten Career Paths for PhDs jobs.ak.uk

- MY MOOC PhD Dooc , annual MOOC on transferable skills, career development for PhDs

Overview of Information and Resources

- **Researching Career Solutions** https://www.insidehighered.com/advice/2016/05/09/applying-research-skills-explore-careers-essay
- **How to Write a PhD Elevator Pitch** https://academicpositions.be/career-advice/how-to-write-an-elevator-pitch
- **How to Write a CV for Roles outside Academia** https://www.imperial.ac.uk/media/imperial-college/administration-and-support-services/careers-service/public/resources/handouts/series/How-to-write-a-CV-for-roles-outside-academia-no-cropmarks.pdf
- **Why Are PhDs Potential Entreprenuers?** https://medium.com/@mangelferrero/why-phds-are-potential-entrepreneurs-df3dec2c544c

Supporting the professional development of reaserchers

- **EURAXESS** https://euraxess.ec.europa.eu/
- **VITAE UK *Making the most of your resaerch project***

https://www.vitae.ac.uk/doing-research/leadership-development-for-principal-investigators-pis/leading-a-research-project/managing-a-research-project/making-the-most-of-your-research-projectg

- **SciLink** *For Reasearchers. By Researchers*

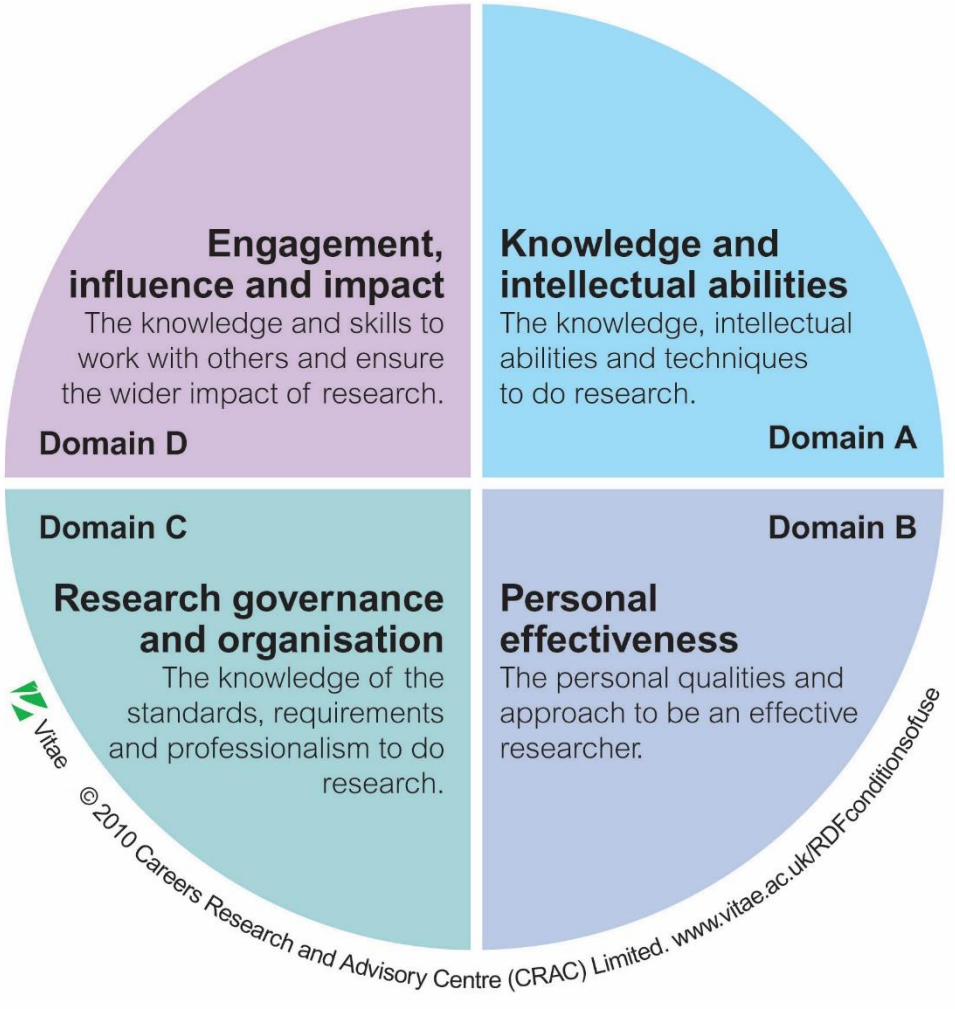
https://scilink.eu/

- **Association Bernard Grégory ABG** www.abg.asso.fr.

VITAE UK

THE RESEARCHERS DEVELOPMENT FRAMEWORK

The Researcher Development Framework (RDF) is **a major new approach to researcher development.** The RDF is a professional development framework for planning, promoting and supporting the personal, professional and career development of researchers in higher education. It articulates the knowledge, behaviours and attributes of successful researchers and encourages them to realise their potential.



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