Academic Advance

Developing the capacity of interdisciplinary research excellence of SNSPA in the field of Management

YOUNG RESEARCHER'S GUIDE

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Argument

This guide is addressed to young researchers, especially Ph.D. students in economics and social sciences, who have the difficult task of swimming for excellence in the turbulent waters of scientific research. The concept of research of excellence, naturally associated with academic research and doctoral research, leads to the thought of a significant challenge. What does research excellence mean, and how to find a balance between the academic/theoretical relevance of a study and its practical / added value for professionals?

In academia, there is a continuous debate on this concept - excellence. What are its qualitative and quantitative dimensions? How can excellence be measured, which is an essential process in evaluating research, funding, and even using the results obtained? As in any academic process, rigor is needed in evaluating research excellence. But excellence itself is a term with a vital qualitative component and how it is possible to do it objectively. During the guide, several points of reference will be given so that young researchers can assess the extent to which they are placed on this path of excellence research. In this initial framework, we mention only three dimensions of research excellence that have been increasingly important in the last decade as emerging landmarks: dynamism, multidisciplinarity, and relevance.

This guide does not aim to analyze the concept of excellence in research, neither from a conceptual-philosophical perspective nor through the prism of measuring it in a pragmatic-functional framework. This guide aims to help young researchers go through the research process more efficiently and professionally, to make the adventure of knowledge an exciting and fulfilling journey by removing obstacles and providing guidance maps. In other words, it is intended to support young researchers so that their path materializes not only in research results that meet quality standards but also to ensure the premises of a relevant research impact outside academia. The presented points of benchmark of this guide are helpful for a clean and appropriate research process, leading to significant results both in terms of the researcher and his study goals, society, and the substantial impact of research in the context of its external ecosystem.

Although the research process is a complex one, which involves a particular social load and dynamics, for practical reasons, this guide focuses primarily on the functional aspects of research: research project development, research funding, networking, documentation, interdisciplinary research, writing academic papers, disseminating research and participating in academic networks.
The guide is realized by the Academic Advance team of the National University of Political Studies and Public Administration (SNSPA), Bucharest, Romania. The Academic Advance project aims to support the strategic progress of the human and logistical infrastructure of SNSPA for interdisciplinary research in the field of Management and Leadership. The project advances a comprehensive mechanism to stimulate excellence in research.

Project implementați-o: April – December 2021. Funding: CNFIS-FDI-2021-0321.

Research sustainability

Defining the sustainability of a research project is a stake from the starting point, from designing the research. It has several dimensions:

Research Dimensions	1. The project may be further implemented after the end of the initial period. A mechanism is being built to ensure the financing of the project in the medium and long term.
	2. The research project contributes to strengthening the institutional capacity; improved performances will be registered as a result of the experience gained during the project.
	3. The project allows the further development of new research lines, which will bring new value in enhancing and extending the results already obtained**.**

A stake in the research process is to generate revenues, which can be invested in developing research infrastructure and the development of new lines of research. In this framework, the assumption of applied research projects can be considered. In addition to the practical impact of these projects, the commercialization of research results brings new funds to continue research or to initiate new research projects.

Another method of attracting funding is to attract funds for technology transfer. In universities, technology transfer is starting to become a priority, which has led to the hiring of technology transfer officers. This shows that the "productive" component of research is becoming increasingly important. We are talking about a financial cycle, but also a spiral of research quality and relevance:

1. Research is facilitated/supported by appropriate funding. The funding is directly proportional to the quality of the research, both of the previous ones carried out by the researcher/research team and of the one foreseen for the process to be funded.

2. The research results are capitalized commercially through technology transfer processes. This process is successful given the existence of a relevant network of stakeholders and partners and the maintenance of a high level of competitiveness of research products.

3. Technology transfer generates new sources of funding and revenue streams.

Resources for technologic transfer:

Innovation and technology transfer entities in Romania Ministry of Research, Innovation and Digitization: www.research.gov.ro

ORDA –Romanian Copyright Office: https://orda.ro/
OSIM –State Office for Inventions and Trademarks: https://osim.ro/
WIPO – World Intellectual Property Organization: https://www.wipo.int/

A relatively recent dimension of sustainability in research refers to ensuring a responsible framework that provides that the research process is in harmony with the environment and the sustainable development of the organization and society. The way research is managed can actively contribute to supporting organizational sustainability. Researching in the light of the principles of sustainability is a matter of informing and training researchers and ensuring an adequate infrastructure. Ligozat, Névéol, Daly, and Frenoux (2020) developed a set of 10 lines of action to be considered to ensure this goal, proposing a paradigm shift in the management of research activity.

For further reading: Ligozat, A. L., Névéol, A., Daly, B., & Frenoux, E. (2020). Ten simple rules to make your research more sustainable. PLoS Computational Biology, 16(9), e1008148.

Also, assuming research topics that consider the understanding of sustainability in an interdisciplinary key is a way to add value at the societal level. Such issues could also have an advantage in the context of competitions for various research grants.

GLOSSARY

Applied research = research that generates marketable technologies.

Research sustainability = approach that allows the level of financial investment and significant effects of the project to be maintained after the completion of the project itself, and the dissemination of results and capitalization on them will continue.

Technology transfer = the process of transferring a technology / intellectual property from the owner/maker to another person or organization, producing benefits to the company and profit for the original owner.

Research funding

Although many researchers are **passionate** about their work, the research results will not be of significant relevance to the organization and society without adequate funding. Obtaining research funding in academia is a considerable **challenge**, given the following data, according to national and European statistics:

2.19% the percentage of R&D expenditures in GDP in the European Union (2019);

0.48% the percentage of R&D expenditures in GDP in Romania (2019);

895 the number of researchers in Romania per million inhabitants (2015), compared to 4,955 in Austria, 2,139 in Poland, 2,569 in Hungary, or 1,989 in Bulgaria;

29.8 research productivity in Romania (2016-2019) compared to 10.1 in Austria, 42.22 in Poland, 8.59 in Hungary, or 4.45 in Bulgaria;

11.2% decrease in the number of researchers in Romania (between 2008 and 2018)

Fig. 1: The evolution of R&D expenditures in Romania and the EU (Visualisations - Science, technology and innovation - Eurostat (Europa.EU)

For further reading

Dulová Spišáková, E., Gontkovičová, B., & Spišák, E. (2021). Assessment of Research and Development Financing Based on the Strategies in EU: Case of Sweden, Slovakia, and Romania. Sustainability, 13(15), 8628.

European Comission (2020, November). Eurostat. R&D personnel. https://ec.europa.eu/eurostat/statistics-explained/index.php?title=R_%26_D_personnel#Researchers

European Commission (2020, November 27). R&D expenditure in the EU at 2.19% of GDP in 2019. https://ec.europa.eu/eurostat/web/products-eurostat-news/-/ddn-20201127-1

UEFISCDI (2021). Policy brief. Doctoral students in Romania. Center for Public Policies.

Useful Resources

Ministry of Research, Innovation, and Digitization: www.research.gov.ro

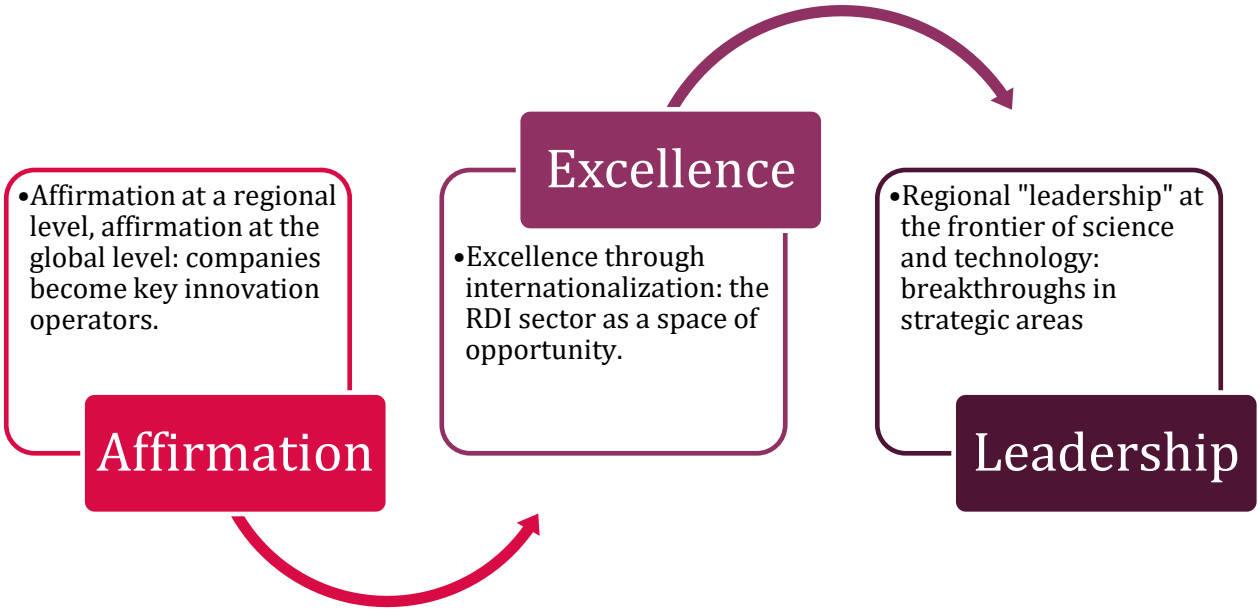
Research grants

Universities generally offer, on a competitive basis, **internal research funding grants.** SNSPA is no exception. The SNSPA's internal research funding strategy aims to support young researchers. The purpose of this approach is to provide an institutional direction to stimulate young researchers to capitalize on their research skills, to develop, through well-targeted mobility, contacts with academic communities relevant to their area of research, to develop managerial skills and experience in the field of writing, enrolling in competitions and coordinating research projects. For this, **SNSPA mini-grants** are offered, for teams of 4-7 members, encouraging interdisciplinary research.

Another line of support for funding, including through financial mechanisms, is provided by CIVICA. **CIVICA - The European University of Social Sciences** is an alliance of some of the most prestigious universities in Europe: Bocconi University, Central European University, European University Institute, Hertie School, SNSPA, SciencesPo, Stockholm School of Economics, London School of Economics, and Political Science. The assumed mission is: *The CIVICA alliance aims to serve European societies and educate the next generations of Europeans. Building upon decades of successful partnerships, we are developing an innovative, resilient, and future-oriented European University that actively contributes to European higher education and research* transformation.

One of the goals of this alliance is to support research excellence in Europe. At the core of this mechanism is CIVICA Research - a joint long-term research and innovation strategy. This framework stimulates joint initiatives, provides networking and research opportunities for doctoral students, postdoctoral researchers, and other teachers/researchers of partner universities. It offers courses, opportunities to participate in summer schools, various workshops, etc. The first postdoctoral research funding scheme has been launched, with a deadline for applications until January 2022. Members of the CIVICA consortium can also apply for the **Visiting Scholar / Fellow** scheme at the London School of Economics, which allows access to LSE research infrastructure.

National research funding is provided by the **multiannual strategy of the Ministry of Research and Innovation**. It is very ambitious and is based on three main pillars:



The targets defined for the research and innovation activity at a national level are the following: increasing the competitiveness of the Romanian economy through innovation; increasing the Romanian contribution to the progress of frontier knowledge; increasing the role of science in society, cross-cutting, systemic stakes are reaching a critical mass of researchers to have sustainability and the development of high-performing research organizations globally.

The strategy is ambitious and defines mechanisms to support public and private research. It also proposes several funding schemes. However, at a practical level, the funding lines assumed are insufficient, and the process does not seem very transparent.

One of the most significant funders of research in Romania is **UEFISCDI**. This institution funds research and excellence both at organizational and individual levels. The first program to support the organizational capacity of Romanian universities is the **Institutional Development Fund (FDI)**. It aims to support public universities to improve the quality of the national higher education system in Romania. The competition has been running since 2016 and has been funded more than 1,100 projects.

Table 1: The evolution of the projects financed by FDI

	2016	2017	2018	2019	2020	2021
No. of applied projects	127	305	239	253	263	261
No. of supported projects	107	150	181	230	243	239
Budget	19,5 mil lei	23,5 mil. lei	44,4 mil lei	58,3 mil. lei	68,9 mil. lei	69 mil. lei

The research funding tree at the national level is presented in Fig. 2.

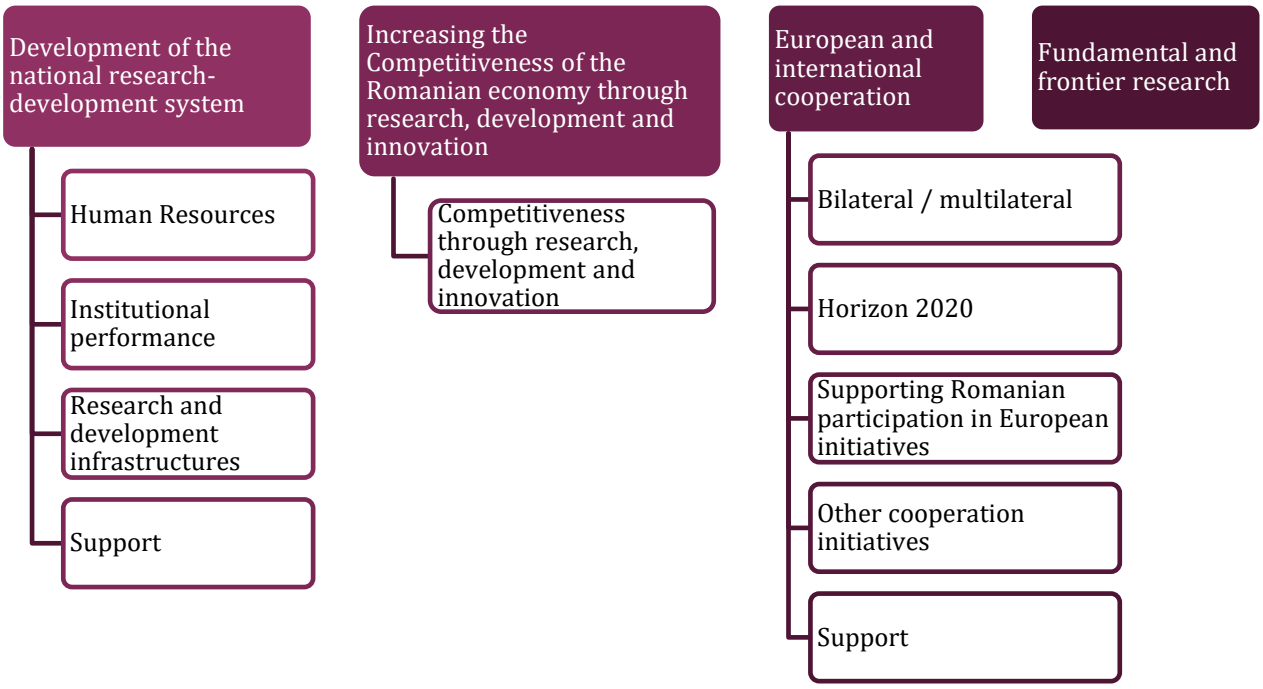


Fig. 2: National research funding through PNCDI III

Several funding schemes are of interest to young researchers.

Postdoctoral research projects (PD). This funding line aims to support young researchers, already PhDs, to develop an independent professional research career in Romanian research institutions to stimulate the scientific excellence of Romanian research. Details: https://uefiscdi.gov.ro/proiecte-de-cercetare-postdoctorala

Research projects to stimulate young independent teams (TE). It aims to support young researchers, PhDs to create or strengthen their research team and an independent research program. Details: https://uefiscdi.gov.ro/proiecte-de-cercetare-pentru-stimularea-tinerelor-echipe-independente

Mobility projects for researchers. They aim to develop human resources in the national research and development system and increase the visibility of Romanian research by publishing and presenting at prestigious international conferences the most significant results, conducting training courses, and ensuring access to adequate research infrastructure. Details: https://uefiscdi.gov.ro/projecte-de-mobilitate-pentru-cercetatori%20

"Spiru Haret" research grants. The aim is to stimulate young Romanian doctoral and postdoctoral students to conduct interdisciplinary research on the Romanian diaspora. Details: https://uefiscdi.gov.ro/burse-de-cercetare-spiru-haret

"Stefan Odobleja" research grants. The aim is to stimulate the performances in the research activity of young Romanian doctoral and postdoctoral students. It leads to the formation of generations open to the European and international scientific environment. This competition was organized only in 2016. Details: https://uefiscdi.gov.ro/burse-de-cercetare-stefan-odobleja

"ERC - like" research projects. This line aims to identify and support Romanian researchers with excellent results obtained in competitions organized by the European Research Council (ERC) to assert the prestige of scientific research in Romania internationally. Details: https://uefiscdi.gov.ro/proiecte-de-cercetare-erc-like

The support of diaspora researchers is also considered through mobility projects for experienced researchers and young researchers.

TIPS

Don't forget always to specify the source of funding for a research project or publication.

The Acknowledgments section must include a list of all persons and organizations that have supported and contributed to the research's financing, design, and smooth running.

At the institutional level, several funding lines are available. Some are associated with PNCDI III (Fig.2). Other sources are **EEA & Norway Grants** or **InnovFin**. The latter has two components: loan facilities and equity investments.

The European Union is also a possible source of funding. It supports both cooperation projects between organizations representing several European countries and individual research projects. There are two main categories of funding schemes: ERC grants for frontier research and the Marie Curie Research Fellowship Program.

ERC grants for frontier research. It is aimed at excellent researchers from any country and in any field. It includes several lines of support: Starting Grants, Consolidator Grants, Public Engagement Award, and Proof of Concept. Details: https://erc.europa.eu/

Marie Skłodowska-Curie actions - Research Fellowship Program. The aim is to support doctoral and postdoctoral research at the European level to contribute to achieving research excellence, stimulating research jobs, investing in equipping researchers with knowledge and skills for the development of cross-border and transdisciplinary cooperation. Details: https://ec.europa.eu/research/mariecurieactions/

Useful Resources

CIVICA Research: https://www.civica.eu/civicaresearch/
Scheme for the Appointment and Extension of Visiting Fellows and Visiting Senior Fellows @ LSE: https://info.lse.ac.uk/staff/services/Policies-and-procedures/Assets/Documents/visFelSch.pdf

Useful Resources

National Research, Development and Innovation Strategy 2014-2020: https://www.edu.ro/sites/default/files/_fi%C8%99iere/Minister/2016/strategii/strategia-cdi-2020_-proiect-hg.pdf
Institutional Development Fund: https://uefiscdi.gov.ro/fondul-de-dezvoltare-institutionala-fdi
UEFISCDI : https://uefiscdi.gov.ro
EEA & Norway Grants: https://uefiscdi.gov.ro/eea-norway-grants-en
InnovFin: https://uefiscdi.gov.ro/instrumentul-financiar-innovfin%20

Excellence in research

Research excellence is also rewarded as follows:

Awarding research results - articles. The aim is to increase Romanian research's quality, impact, and international visibility by recognizing and rewarding significant results published in prestigious journals in the leading global scientific flow. In the period 2016-2020, about 17,000 works were financed. Details: https://uefiscdi.gov.ro/premierea-rezultatelor-cercetarii-articole

Awarding research results - patents. The purpose of this financing line is to increase the impact and international visibility of Romanian research - development - innovation by recognizing and rewarding significant results protected by patents. In the period 2017-2020, 872 projects were awarded. Details: https://uefiscdi.gov.ro/premierea-rezultatelor-cercetarii-brevete

Business environment. Another approach to securing research funding is through direct collaboration with the business environment. The research & development funds managed by private business organizations are nationally higher than the public funding of research.

GLOSSARY

TRL -Technology Readiness Level is a tool for understanding the technical maturity of the technology in the acquisition phase. SEE MORE HERE

UEFISCDI - Executive Unit for Financing Higher Education, Research, Development, and Innovation is a research funding agency, subordinated to the Ministry of Education and Research, which ensures both studies that substantiate the process of allocating funds allocated from the state budget for universities, as well as the coordination, from an administrative point of view, of some programs and sub-programs from the National Plan for Research, Development, and Innovation. https://uefiscdi.gov.ro/

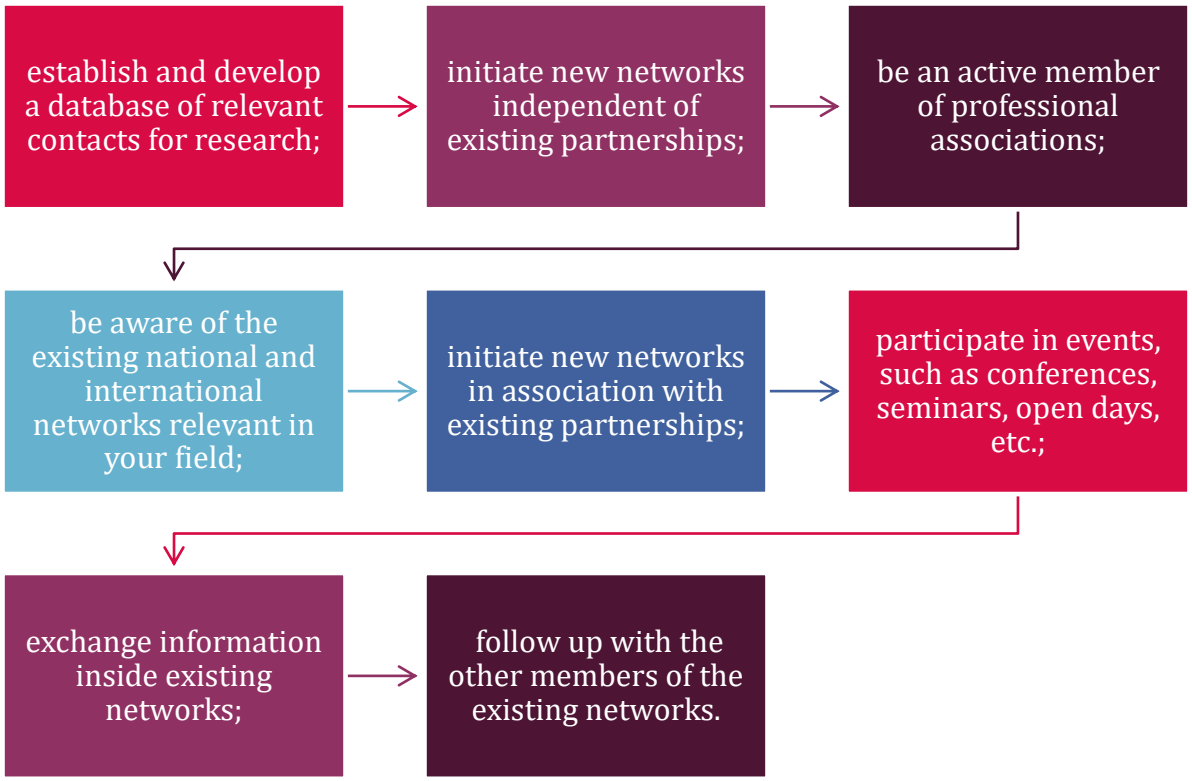
Useful Resources

EU Funding Programs: https://ec.europa.eu/info/research-and-innovation/funding/funding-opportunities/funding-programmes-and-open-calls_en
EU Fellowships and individual research: https://ec.europa.eu/info/research-and-innovation/funding/funding-opportunities/fellowships-and-individual-research-grants_en

Networking

Networking seems to be a secondary activity to research development and management. Nevertheless, its value is extremely high when considering its impact on designing and implementing projects. It also helps to extend access to information and resources and disseminate the results better and valorize them. Networking is based on **formal and informal partnerships** established for common research aims and better management of the research projects.

The formal partnerships are developed at an organizational level. They should include provisions on common objectives, responsibilities of partners, contributions of partners, period of cooperation, how will be undergone the collaboration, and the benefits and their distribution. More extensive partnerships could ally with organizations or managers of various organizations. Team members/researchers should be aware of such partnerships and alliances to take advantage of the benefits offered. They also should be mindful of informal coalitions and associations if they exist.
Any member of a research/academic network might **benefit** from it in various ways: access to resources and information, access to research infrastructure, venues for publishing, etc. Therefore, actively building and participating in networks is beneficial both for individuals/researchers and organizations. To be part of such a scheme, researchers might consider the following



Researchers might also be aware of the existence of search engines that are designed to find partners for European programs. Also, some websites are posting information on possible partnerships.

Useful Resources

Useful databases for project and partner search

European Commission - Funding & tender opportunities: https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/home
Innovation Place: https://www.innovationplace.eu/find-partners-research-projects
List of databases of EU-funded research and innovation projects: https://ec.europa.eu/info/research-and-innovation/projects/project-databases_en
NET4SOCIETY – Partner Search Support: http://www.net4society.eu/public/pss.php
Up2Europe: https://www.up2europe.eu/european/projects/

Academic and professional networking

Academic networking

Being part of an academic network might bring a researcher many benefits, such as increased visibility of their research, access to knowledge and enhanced knowledge transfer, opportunity access and valorization, etc. To maximize such outcomes, a researcher might consider the following:

be an active member of the academic community;

be part of professional organizations/associations;

take an active part in conferences, seminars, and other professional events

develop social media presence, enhancing the academic profile

Nanon Labrie et al. (2015) identify **types of networking** suitable to young researchers:
- active-passive networking;
- strategic-spontaneous networking;
- vertical-horizontal networking;
- instrumental-relational networking;
- interest-driven-task-driven networking.

For further reading

Labrie, N., Amati, R., Camerini, A. L., Zampa, M., & Zanini, C. (2015). "What's in it for us?" Six dyadic networking strategies in academia. Studies in Communication Sciences, 15(1), 158-160.

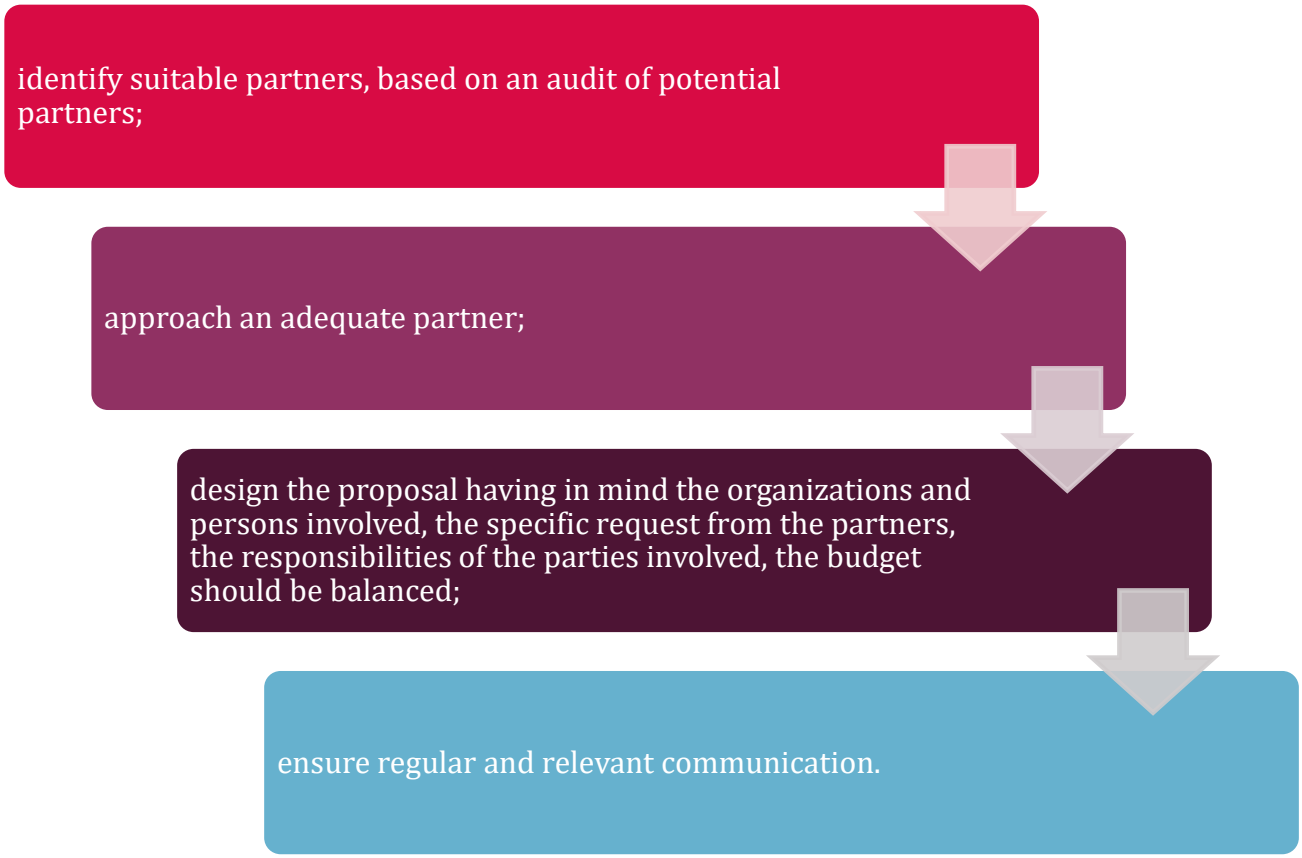
Networking with professionals/the industry

Cooperation with the industry might lead **to high value for both parties**. Therefore, increased attention should be given to this process. On the other hand, significant differences in values, visions, and approaches might be observed. Thus, thorough discussions and consistent planning are required. Having this in mind, long-term partnerships are to be considered over one-time projects.
Why engage with companies?

- companies might have resources and infrastructure that the researcher needs;
- companies might transfer knowledge towards researchers;
- companies might bring experience and fresh perspectives;
- companies might offer or provide access to (co)funding;
- researchers involved develop their portfolio, CV, and personal network;
- joint projects might lead to extended networks.

Engaging with a potential industry funder or partner might be difficult, considering the high expectations and various risks associated with actual cooperation. Understanding the potential threats and having real benefits might facilitate this process and lead to consistent collaboration.
A key aspect for establishing and developing joint research or other cooperative projects is consistently **preparing the proposals**.

The steps to be considered in this process are:



TIPS

Industry representatives evaluate positively cost-effective proposals and proposals that address one specific issue/problem.

Companies should comply with various standards. Therefore, partnerships and joint projects would closely consider these requirements.

Companies are more attentive to personal aspects and might restrict content in case of publication of the research results.

Follow-up might activate lucrative networks.

Networking with funders

This dimension of networking contributes to enhanced cooperation, leading to better chances to continue financing a project. It could also contribute to technology transfer.

Networking with media

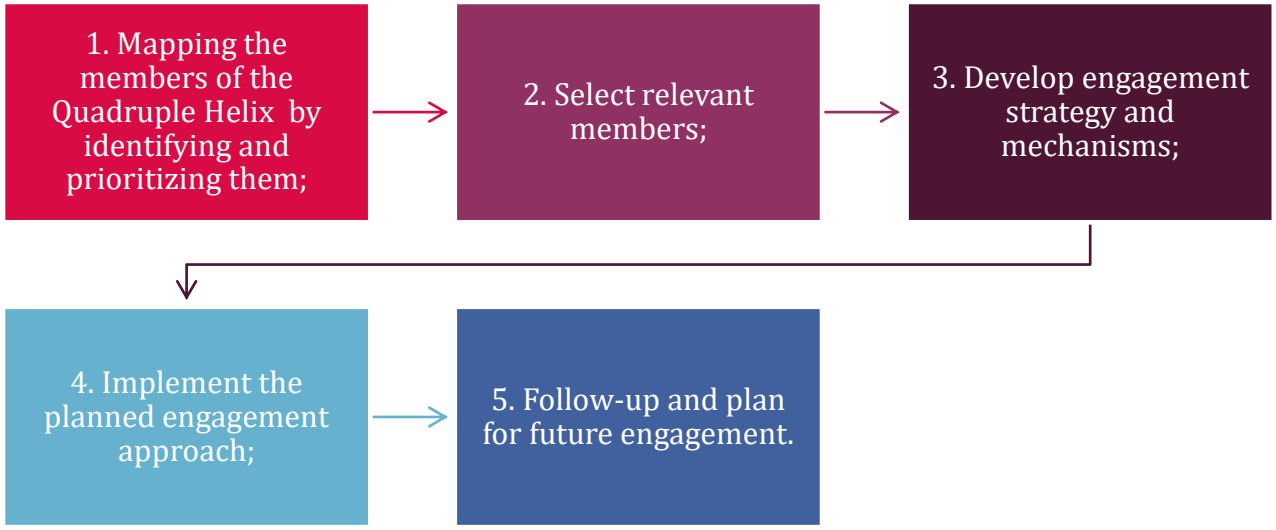
Sustainable projects, aiming to have a significant impact outside the research organization, in the broader society, should be considered under the auspices of good media relationships. Media outlets could be presenters of the projects and their results; they could advocate increasing the project's influence. Ensuring media support, which might be cautious, could be based on fact-based relationships. Media partnerships are based on long-term efforts, on constant connection, as well as on shared values.

It might be beneficial also to develop trustfully and close connections with the influencers associated with community/citizen science. Networks including this type of participatory research would help better understand scientific concepts and results among the wider public and would increase the relevance and impact of the researcher's scientific results.

The Quadruple Helix

The Quadruple Helix model refers to the continuous networking and cooperation between four important actors of the ecosystem: university, industry, government, and society. The Quadruple Helix perspective contributes to understanding approaches to innovative and significant research. Acting under such a framework would help researchers enhance the research processes from the design stage to dissemination. The benefits of such an approach are numerous: new lines of research, open innovation, enhanced knowledge flows within the ecosystem, co-creation, research grants, crowdsourcing, etc. Therefore, being an active part of this ecosystem is beneficial both for researchers and for organizations.

The Quadruple Helix is a network of relationships; its members are interconnected and stakeholders to each other. Having this perspective in mind, identifying and engaging the most relevant members of the Quadruple Helix contributes to the sustainable development of research projects. The following steps might be considered:



For further reading

Hasche, N., Höglund, L., & Linton, G. (2020). Quadruple Helix as a network of relationships: creating value within a Swedish regional innovation system. Journal of Small Business & Entrepreneurship, 32(6), 523-544. https://doi.org/10.1080/08276331.2019.1643134

Miller, K., McAdam, R., & McAdam, M. (2018). A systematic literature review of university technology transfer from a quadruple helix perspective: toward a research agenda. R&D Management, 48(1), 7-24. https://doi.org/10.1111/radm.12228

Yun, J. J., & Liu, Z. (2019). Micro-and macro-dynamics of open innovation with a quadruple-helix model. Sustainability, 11, 3301; https://doi.org/10.3390/su11123301

GLOSSARY

Citizen/ community science = scientific research developed, at least partly, by amateur scientists.

Quadruple Helix = a framework of cooperation and exchange of information considering four subsystems: academia, industry, government, and society.

Interdisciplinary research

The concept of interdisciplinarity has been used as a buzzword in academia for some time. But what does it mean? And why is it so alluring to research projects?

An interdisciplinary research approach is especially relevant in a fast-moving, dynamic environment. It can provide a more holistic and in-depth perspective by integrating knowledge from separate disciplinary fields. The interdisciplinary approach has gained traction and interest because of its capacity to make science accountable to society (Barry, Born & Weszkalnys, 2008, as cited in Lury 2018, p. 2). One downside to accountability is that researchers may be inclined to adapt their interests to suit the political or social agenda, leading to a loss of autonomy of academic knowledge production (Barry, Born & Weszkalnys, 2008, as cited in Lury 2018; Bruce et al. 2004). Nevertheless, interdisciplinary research provides researchers with the means to address complex problems of global importance that have practical consequences.

Definitions of key terms

Interdisciplinary research has been widely debated; the concept of interdisciplinarity has various definitions and shifting relations to multidisciplinary and transdisciplinary (Lury, 2018) analysis. Therefore, a better understanding and delimitation is required:

Interdisciplinary research (IDR) approaches "integrate separate disciplinary data, methods, tools, concepts, and theories to create a holistic view or common understanding of a complex issue, question, or problem." (Wagner et al., 2011, p. 16). Cecile Lury (2018) argues that interdisciplinarity emerges through interferences between disciplines and between disciplines and other forms of knowledge. Another comprehensive and complementary definition of IDR points out that IDR "is a mode of research by teams or individuals that integrates information, data, techniques, tools, perspectives, concepts, and/or theories from two or more disciplines or bodies of specialized knowledge to advance fundamental understanding or to solve problems whose solutions are beyond the scope of a single discipline or area of research practice." (The National Academies, 2005, p. 188).

Multidisciplinarity refers to the juxtaposition of disciplinary/professional perspectives, adding breadth and available knowledge, information, and methods (Wagner et al., 2011). Multidisciplinary research is not necessarily integrative; although it involves more than a single discipline, each discipline makes a separate contribution (The National Academies, 2005).

Transdisciplinarity approaches are comprehensive frameworks that transcend the narrow scope of disciplinary worldviews. Transdisciplinary research represents a new mode of knowledge production that draws on expertise from a broader range of organizations and collaborative partnerships for sustainability that integrate research from different disciplines with the knowledge of stakeholders in society (Wagner et al., 2011).

Opportunities and challenges of interdisciplinary research

Understanding the opportunities and challenges of interdisciplinary research may be beneficial at the start of the researcher's career as it may help manage and exploit the right opportunities. The opportunities and challenges mentioned and summarized in the table below (Table 1. Opportunities and challenges) are defined and discussed in the literature. They are relevant for individual researchers and collaborative teams.

Table 1. Opportunities and challenges

Opportunities	Challenges
Networking and developing connections; interaction with specialists in other disciplines.	Language and communication issues are derived from cultural differences; challenging to interact and engage with specialists from other disciplines.
Broadens knowledge and understanding that generates new insights with real-life, high societal relevance.	Organizational structures do not always favor IDR. In Romania, institutional regulators discourage interdisciplinarity.
Shares experiences, intelligence, and resources to foster organizational learning (Lyall, 2019, p.117).	Maintaining a clear research identity – the risk of losing your focus area, impacting your reputation.
Increases career opportunities; Diversity of career experience (Woolley et al. 2014).	Negative discrimination in research funding and publication evaluation processes (Woolley, 2014, p. 4).
Access certain funding pools (see, for example, Horizon 2020).	Stereotyping - lesser value for people in soft sciences than those from hard sciences; this can lead to significant misconceptions about the other's approach (Miller & Mansilla, 2004, as cited in Wagner, 2011).
Flexibility to explore the interfaces between disciplines; Possibility to diversify the portfolio and methodological tools; multiple skills can be developed.	Difficulties in organizing meetings and understanding the task at hand when working in international interdisciplinary teams.
Learn the language, culture, and knowledge of a new discipline.	Finding common ground with different stakeholders.

TIPS FOR RESEARCHERS

Keeping up to date with new publications, developments, and trends in a primary discipline and maintaining broader interdisciplinary interests can help your competitiveness; Read about others' experiences; It can be beneficial for collaborations or networks in the future.

Find a mentor (a senior or more experienced colleague) to find your focus and facilitate your involvement in more significant research projects.

TIPS FOR RESEARCHERS

Keep in mind that networking can help open opportunities. Find conferences and events in your interest area and engage with colleagues from different disciplines and backgrounds.

A researcher's reputation may increase their work profile, influencing the respect they get from other specialists and researchers.

- To build your researcher reputation, you must:
  - Define your research interest clearly and find a focus area.
  - Always respect your work responsibilities (e.g., agreed deadlines): work ethic is critical for your reputation. A healthy work ethic: (1) increases collaboration, effectiveness, and productivity; (2) can offer more opportunities for you in the future leading to various other research collaborations.
  - Be strategic & set your priorities. Working in research teams can derail your trajectory. Do not waste time and effort in various directions, but come back to your research interest and select the projects you want to contribute to while maintaining your identity as a researcher. Furthermore, if you are working on an interdisciplinary research project and publish papers with multiple authors, make sure your contribution to the chosen publication will be helpful to you. Pay close attention that some journals may have a lesser impact on your academic evaluation (this is a valid concern and challenge in Romania).
  - For better visibility of your work within the academic and research community, use ORCID to keep track of your work.

Food for thought

There are many ways of approaching and doing research. Interdisciplinary research comes with many opportunities that make pursuing an interdisciplinary career development an attractive idea, as it facilitates the integration of different disciplines and perspectives in your research. On this note, you can consider the following quote from Lyall et al. (2011, p.105): "Interdisciplinary careers can therefore result in a multitude of different directions and stages: from collaborative interdisciplinarity through to holding multiple disciplinary identities, to a liminal place between disciplines and individual interdisciplinarity and identification with a newly formed discipline."

For further reading

Lury, C. Fensham, R., Heller-Nicholas, A., Lammes, S., Last, A., Michael, M. & Uprichard, E.(eds.) (2020). Routledge Handbook of Interdisciplinary Research Methods (2nd ed.). Routledge.

Leahey, E., & Barringer, S. N. (2020). Universities' commitment to interdisciplinary research: To what end? Research Policy, 49(2), 103910. doi:https://doi.org/10.1016/j.respol.2019.103910

Lyall, C. (2021). Interdisciplinary wiki. https://www.wiki.ed.ac.uk/display/ISSTIInterdisciplinary

References

Barry, A., Born, G., & Weszkalnys, G. (2008). Logics of interdisciplinarity. *Economy and Society*, 37(1), 20–49. https://doi.org/10.1080/03085140701760841

Lury, C. Fensham, R., Heller-Nicholas, A., Lammes, S., Last, A., Michael, M. & Uprichard, E.(eds.) (2018). *Routledge Handbook of Interdisciplinary Research Methods* (1st ed.). Routledge.

Lyall, C., Bruce, A., Tait, J., & Meagher, L. (2011) Interdisciplinary Research Journeys: Practical Strategies for Capturing Creativity. *Bloomsbury Academic*. http://dx.doi.org/10.5040/9781849661782

Miller, M., & Mansilla, V. B. (2004). *Thinking across perspectives and disciplines*. Harvard Graduate School of Education.

The National Academies. (2005). *Facilitating interdisciplinary research*. National Academies Press.

Wagner, C. S., Roessner, J. D., Bobb, K., Thompson Klein, J., Boyack, K. W, Keyton, J.; , Rafols, I., & Börner, K. (2011). Approaches to understanding and measuring interdisciplinary scientific research (IDR): A review of the literature. *Journal of Informetrics*, 5(1), 14–26. https://doi.org/10.1016/j.joi.2010.06.004

Woolley, R., Sanchez-Barrioluengo, M., Turpin, T., & Marceau, J. (2014). Research collaboration in the social sciences: What factors are associated with disciplinary and interdisciplinary collaboration? *Science and Public Policy,* 42(4), 567–582. https://doi.org/10.1093/scipol/scu074

Writing a scientific paper

The structure of a scientific paper

Writing a scientific paper requires rigor and a lot of practice. The form and structure of a scientific paper depends on:

- the type of the article (e.g., quantitative, qualitative, mixed methods, theoretical or methodological articles)
- the scientific journals in which it will be published (e.g., some journals publish only primary, or original research)

However, a common, standard format can be identified and taken into consideration when writing. If we were to sum up the most common sections of the scientific papers, then it would be the following:

- Abstract: summarizes your paper: describe your study methods, findings, and state your conclusions.
- Keywords: usually part of the abstract; they need to be relevant and illustrate the most important aspects of your paper.
- Introduction: presents the importance of the approached topic, including theoretical or practical implications, establishing a context. Offer a succinct characterization of the relevant literature and research in the field. State your objective and hypothesis at the end of the introduction if you conduct quantitative research. For a qualitative approach describe the research problem or question, framing it in its context.
- Methods: provide clear and comprehensive information on the research methodology employed in your article. Reporting quantitative and qualitative or even mixed research is requires a different approach. However, you should provide information on all the steps of your research procedure: the scope and the subject of the study, the research design, the hypothesis or research questions, the instruments' design. In the Publication Manual of the American Psychological Association, 7th ed. (2020), pages 77-81 and 95-99, you can find further clarification, some of it presented below:

Quantitative research	Qualitative research
Hypothesis, Aims, and Objectives State specific hypotheses, aims, and objectives, including: - theories or other means used to derive hypotheses - primary and secondary hypotheses - other planned analyses: state how hypotheses and research design relate to one another. Participant Characteristics: major demographic characteristics and important topic-specific characteristics (e.g., achievement level in studies of educational interventions). Sampling Procedures: sampling method, percentage of the sample approached that actually participated, describe settings and locations where data were collected as well as dates of data collection Sample Size, Power, and Precision: intended sample size and achieved sample size Data Collection: describe methods used to collect data. Instrumentation: provide information on validated or ad hoc instruments created for individual studies Conditions and Design: state whether conditions were manipulated or naturally observed. Report the type of research design Data Diagnostics: criteria for post-data-collection exclusion of participants, if any, definition and processing of statistical outliers, analyses of data distributions Analytic Strategy: Describe the analytic strategy for inferential statistics and protection against experiment-wise error for - primary hypotheses - secondary hypotheses - exploratory hypotheses	Objectives/ Aims/Research Goals - State the purpose(s)/goal(s)/aim(s) of the study. - State the target audience, if specific. - Provide the rationale for fit of design used to investigate this purpose/goal (e.g., theory building, explanatory, - developing understanding, social action, description, highlighting social practices). - Describe the approach to inquiry, if it illuminates the objectives and research rationale (e.g., descriptive, interpretive, - feminist, psychoanalytic, postpositivist, critical, postmodern, constructivist, or pragmatic approaches). Research Design Overview (data-collection strategies, data-analytic strategies, approaches to inquiry); Provide the rationale for the design selected. Study Participants or Data Sources: include researcher description & background, provide the numbers of participants/documents/events analyzed, the demographics/cultural information, describe existing data sources. Participant recruitment & selection: Describe the recruitment process (e.g., face-to-face, telephone, mail, email) and any recruitment protocols, describe the participant selection process (e.g., purposive sampling methods, convenience sampling methods, theoretical sampling; diversity sampling) and inclusion/ exclusion criteria. Data collection - State the form of data collected (e.g., interviews, questionnaires, media, observation).

- Results/findings: Present key research findings, without interpretation and considering your study design. Emphasis is placed on the practical implications of the conducted study.
- Discussion: Interpret, comment your results based on drawing on previous theory and research in the field. Explain how your new findings change our understanding of the problem. For quantitative studies provide a statement of support or nonsupport for all hypotheses. For qualitative studies describe the central contributions and their significance in advancing disciplinary understandings. Identify directions in which the research can be developed.
- References: provide the information on each work cited in the text.

When writing a scientific paper, you also should consider that every journal or conference has a specific set of guidelines that should be taken under consideration when writing your paper. Most journals in the economics and management fields use the American Psychological Association style and citing. However, some journals, even renowned ones have peculiarities in terms of style, or even a personal style in terms of format, structure, and citation. Therefore, when writing a scientific paper for publication, you should always begin with the author guidelines available on the journals' website.

GLOSSARY

Types of articles

This glossary summarizes the different types of research articles discussed in the Publication Manual of the American Psychological Association, 7th ed. (2020), pp. 5-9

Quantitative articles - report original, empirical, quantitative research. Quantitative research refers to a set of approaches commonly used in the behavioral and social sciences and related fields in which the observed outcomes are numerically represented.

Qualitative articles - report original, empirical, qualitative research. Qualitative research refers to scientific practices that are used to generate knowledge about human experience and/or action, including social processes.

Replication articles - report the results of work intended to verify or reproduce findings from previous investigations. The aim of a replication study is to examine whether the conclusions from an earlier study remain the same or similar over variations in the conduct of the original study.

Theoretical articles – describe advancements in theories or methods. They use existing

Methodological articles - present new approaches to research or practice, modifications of existing methods, or discussions of quantitative and/or qualitative data analysis.

Useful Resources

American Psychological Association. (2020). Publication manual of the American Psychological Association (7th ed.). https://doi.org/10.1037/000016S-000

American Psychological Association (2021). Style and Grammar Guidelines. https://apastyle.apa.org/style-grammar-guidelines

Borja, A. (2014). 11 steps to structuring a science paper editors will take seriously. Elsevier Connect. https://www.elsevier.com/connect/11-steps-to-structuring-a-science-paper-editors-will-take-seriously

References and citations

In academic and scientific writing acknowledging, crediting the sources you used in your paper is essential. The use of citations and references must become second nature, especially when you are building on and critically examining the existing literature. For this reason, you must understand and properly follow certain principles in citation and referencing usually defined by citation-style guidelines. Each journal can have its own set of rules and format for citing and references which you can find on their website under Guidelines/Instructions for authors. However, most of the journals base their guidelines on existing, well-established formats, such as:

- Publication Manual of the American Psychological Association(APA), 7th edition: predominantly used in social and behavioral sciences (economics, management etc.)
- MLA Handbook for Writers of Research Papers, 9th edition: usually used in literature, arts, and humanities.
- American Medical Association Manual of Style (AMA), 11th edition: usually used in medicine, health, and biological sciences.
- Chicago Manual of Style, 17th edition: a standard guide to citation practice, used by writers, editors, proofreaders, indexers, copywriters, designers, and publishers.
- Harvard Style: is commonly in humanities and the social sciences.

APA style of refencing is one commonly used by many scientific journals, that provides specific in-text citation and reference guidance. For this reason, we will look at some of its main characteristics.

American Psychological Association(APA) - citation & reference guidelines

APA style uses in-text author-date citation. Hence, the author's last name and the year of the publication for the source will be given in text, within parentheses, for example (Smith, 2021). When a parenthetical citation is at the end of a sentence, put the period or other end punctuation after the parenthesis. All in-text citations will appear in the reference list at the end of the paper. Special attention should be given in the following situations:

- **Citing Multiple Works**.
    - When citing multiple works place the citations in alphabetical order, separating them with semicolons. For example. (Adams et al., 2019; Smith & Jons, 2020; White, 2017).
    - Arrange two or more works by the same authors by year of publication, for example, (Smith, 2019, 2020a, 2020b, 2021). This particular example brings us at another important situation when we have **multiple works with the same author and same date.** In this case, just as seen in the example above include a lowercase letter after the year to differentiate between the papers. The year-letter combination is used in both the in-text citation and the reference list entry.
- **Citing a specific part of the source**. If you are directly quoting from another work, you should include the page number in either parenthetical or narrative citation. Use the abbreviation "p." to indicate a single page. For multiple pages use "pp." and separate the page range with an en dash before listing the page number(s). For example, (Smith, 2021, p. 202) or (Smith, 2021, pp. 202-203). If pages are discontinuous, use a comma between the page numbers (e.g., pp. 67, 72). If the page number is missing, for example when you cite webpages, or ebooks, you still must provide readers with a of locating the quoted passage. In this case the following practices are acceptable:
    - Provide a heading or section name – for example (Smith, 2021, Risk management: More breadth, not enough depth section).
    - Provide an abbreviated heading or section name in quotation marks if the section name is too long (Smith, 2021, "Risk management" section).
    - Provide a paragraph number (count the paragraphs manually if they are not numbered). For example (Smith, 2021, para. 10).

- **Number of authors.**

Author	Parenthetical citation	Narrative citation
One author	(Smith, 2020)	Smith (2020) points out…
Two authors	(Smith & Jones, 2020)	Smith and Jones (2020) illustrate…
Three or more authors	(Smith et al., 2020)	Smith et al. (2020)
Group author	(Mckinsey Institute, 2021)	Mckinsey Institute (2021)
Group author with abbreviation		
First citation	(American Psychological Association [APA], 2020)	The American Psychological Association (APA, 2020) described ...
Subsequent citations	(APA, 2020)	APA (2020)
	In the reference list entry, do not abbreviate the group author name, use the full name of the group as presented in the source.	
Pay attention that "et al." is plural (meaning "and others"), and it cannot stand for only one name		

(Source: American Psychological Association [APA], 2020)

- **Unknown author or date**
  - If you do not know the **name** of the author and you cannot determine the name, then move the title of the work to the author position (followed by a period), before the date of publication. If, and only if, the work is signed ''Anonymous,'' use ''Anonymous'' as the author. For example, Anonymous. (2017).
  - For works with no date, write "n.d." (which stands for "no date") in parentheses. For example, (Smith, n.d.).

How to cite references

- **Journals** (academic journals, magazines, newspapers, newsletters, and even blogs and other online platforms that publish articles).

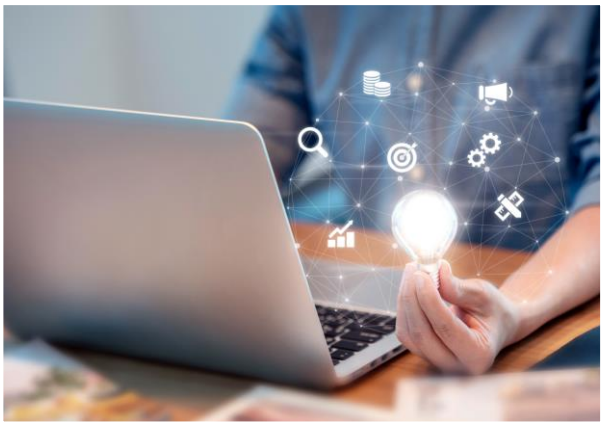
Author	Date	Title	Source		Examples
			Journal Information	DOI or URL	
Author, K. & Author, B.	(2020)	Title of article.	*Title of journal written in italics*, Number (issue), pages	http://doi.org/xxx	See here academic journals
Author, B. Name of Group Username	(2021, November) (2021, November 16)	Title of article	*Title of Periodical*.	http://...	See here: 1 magazines 2 newspapers 3 blogposts

- **Books**

Author	Date	Title	Source		Examples
			Publisher information	**DOI or URL**	
Author, K. & Author, B.	(2020).	*Title of book. Written in italics*	Publisher	http://doi.org/xxx	See here Whole authored book
Author, B.	(2021).	*Title of book (2nd ed.)*	Publisher		
Name of Group.	(2019).	*Title of book*	Publisher	http://doi.org/xxx	
Editor, E. E. (Ed.). Editor, E. E., & Editor, F. F. (Eds.).	(2019).	*Title of book.*	Publisher		Whole edited book
Chapter in edited book					
Author	Date	Title	Editors	Edited book information	
Jons. B.	(2020)	Title of chapter.	In K. Smith & A. Adams	*Title of book* (4th ed., pp. 116-129)	Publisher. DOI/URL

- **Reports and grey literature**

Author	Date	Title	Source		Examples
			Publisher information	**DOI or URL**	
Author, K. & Author, B. Name of group	(2020). (2021, May 2).	*Title of report written in italics.* *Title of gray literature* [Description].	Publisher name	http://doi.org/xxx	See here 1 Government report 2 Press release 3 White Paper 4 Report with individual authors



- **Online Media & webpages**

Author	Date	Title	Source		Examples
			SM Site name	URL	
Twitter and Instagram: Author, A A [@username] Name of Group [@username] *Facebook and others* Author, A A. Name of Group Name of Group [username) Username	(n.d.). (2021, August 2).	*Content of the post up to the first 20 words.* *Content of the post up to the first 20 words* [Description of audiovisuals] [Description of audiovisuals].	Site name	http:// doi.org/ xxx	See here 1 Instagram 2 Facebook
Webpages					
Author	Date	*Title of work*	Site Name	URL	See here 1 Webpage on a Website References 2 Whole Website References

TIPS FOR RESEARCHERS

For managing your references and organizing your research you can use apps and software such as **EndNote** (www.endnote.com), **Mendeley** (https://www.mendeley.com), **RefWorks** (https://refworks.proquest.com/researcher/).

Plagiarism

No academic or scientific paper can overlook refences and citations, under any circumstance. Failing to provide credit to the sources used in the paper, and accurate information on each work cited is considered plagiarism.

The American Psychological Association (2020) defines common forms plagiarism: improper use of someone else's words and/or ideas. (See here: Avoiding Plagiarism Guide - Giuliano, 2021). In addition to these two forms of plagiarism, you also avoid self-plagiarism. Presenting your previously published work as original work is unethical and may lead to copyright violations.

The main way through which you can avoid plagiarism is to always acknowledge the source. You can incorporate others' ideas and words into your own writing by including the following techniques:

- Paraphrasing: expressing the meaning of a relevant idea(s) from an author or source in your own words (it requires citation).
- Summarizing: succinctly presenting the idea put forward by another author in your own words (it requires citation).
- Synthetizing: bringing together and describing ideas of more than one author in your own words (it requires citation).
- Quoting: use the exact words of the author because you cannot express it any other way, or because it is especially relevant. Always use quotation marks and include the page number of the source, if available.