



This project has received funding from the European Union's Horizon 2020 Science with and for Society programme under grant agreement no. 872483

Project acronym:
DocEnhance

Project title:
"Enhancing skills intelligence and integration into existing PhD programmes by providing transferable skills training through an open online platform"

Grant agreement No: 872483
Project funded by the European Commission
within the Horizon 2020 Programme

Start date of project: 1 January 2020
Duration: 36 months

Deliverable No. 1.3

Good practice recommendations for implementation of career-tracking survey

Due date of deliverable	31/12/2021
Submission date	10/05/2022
File Name	D1.3 DocEnhance_Good practice recommendations for implementation of career-tracking survey
Organisation Responsible of Deliverable	European Science Foundation
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Revision number	01
Status	Final ¹
Dissemination Level	PU ²

¹ Document will be a draft until it is approved by the coordinator.

² PU: Public, PP: Restricted to other programme participants (including the Commission Services), RE: Restricted to a group specified by the consortium (including the Commission Services), CO: Confidential, only for members of the consortium (including the Commission Services).



Revision History			
Version	Date	Modified by	Comments
0.1	06/05/2022	Mihaela Rusitoru and Julia Boman, ESF	First version



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10/05/2022



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1. INTRODUCTION

This good practice guide presents lessons learnt from the career-tracking survey of recent PhD graduates from nine European universities, undertaken as part of the DocEnhance project³ funded by the European Union. The DocEnhance project's overall aim is to enhance existing PhD programmes by integrating transferable skills and a more career-oriented curriculum into doctoral training and by preparing PhD holders to work in a variety of jobs outside and inside academia. The improvement of transferable skills focusses on 3 main pillars, namely:

- 1) involving the non-academic sector in developing a more employment- and innovation-oriented transferable skills curriculum for PhD programmes
- 2) facilitating work-based learning and business-education partnerships through developing PhD courses
- 3) tracking PhD graduate career paths to gather intelligence on skills mismatches and identify the added value of doctorate in recruitment mechanisms and labour market entering.

As the third major element of the DocEnhance project, the career-tracking survey intended to inform the transferable skills curriculum recommended by the project, as well as the roadmap for making use of the resources developed over the course of the project. The main objective of the career-tracking survey is to facilitate a sustainable and harmonized assessment of PhD education in Europe. Thus, the good practice recommendation for implementation of the survey represents a practical guide for the participating nine universities, as well as for other European and non-European universities, who may wish to implement career-tracking studies in the future.

In this regard, the guidelines with recommendations are published as a European voluntary standard to increase outreach, impact and longevity of career paths tracking. The outcomes on the implementation of career-tracking survey are formulated as a low-level European voluntary standard and a reference document emanating from the European Committee for Standardisation (CEN Workshop Agreement - CWA) and will be actively distributed by the CEN for 3-6 years after project end. Such European standards have proven successful in ensuring that project results are communicated and disseminated in a format allowing for utilisation and implementation after project end. The purpose of the standardisation is to assist higher education institutions in running their own PhD graduate tracking for increasing the relevance of their PhD research and training.

2. CONTEXT AND CONCEPTUAL FRAMEWORK OF CAREER-TRACKING SURVEYS

Career tracking has become increasingly recognised as a necessary monitoring tool to map PhD graduate career paths and evaluate the PhD skills training. Career-tracking surveys of PhD

³ For more information about the DocEnhance project, see: <https://docenhance.eu>.



graduates have been demonstrated to be a useful and efficient tool for producing high-quality data concerning PhD employability and skills training. One of the major outputs of the DocEnhance project has been such a survey conducted among nine participating universities. The DocEnhance career-tracking survey was mainly built upon an existing PhD graduate tracking surveys conducted among nine higher education institutions by the European Science Foundation in 2017 and 2015. The findings of the DocEnhance survey for tracking of PhD graduates (Boman et al, 2021)⁴ are available through the DocEnhance platform.

Definition of career-tracking of researchers

The European Science Foundation has been involved in career-tracking survey and research career development for over a decade. Over the years, several surveys were carried out, accompanied by events organized and reports disseminated to share findings and recommendations to track researchers' paths. A variety of concepts and practices arose from this academic dialogue and the career tracking of researchers was defined as representing⁵:

Initiatives that follow up researchers' careers over a certain time period to understand researchers' career pathways. Surveys that trace back careers over several years, cohort studies at several moments in time (not just one) or longitudinal surveys are considered to fit the definition (European Science Foundation (ESF), 2012, p. 4).

Beyond that, tracking researchers' careers was included into the science policy agenda in Europe, more and more focused on European strategy for universities⁶.

Purposes of career-tracking surveys

The goals of a career-tracking study can be considered at three various levels⁷:

- 1) Individual level, to evaluate motivation and job satisfaction of research careers, to understand the motivation of engaging in PhD training and to provide career orientation and transferable skills for working both inside and outside the academia;
- 2) Institutional level, helping higher education institutions to update and adjust PhD training in accordance with the labour market needs, to focus on transferable skills training and career development and to increase institutional attractiveness by promoting inter-institutional and inter-sectorial partnerships;

⁴ Boman, J., Beeson, H., Sanchez Barrioluengo, M., and Rusitoru, M. (2021). What comes after a PhD? Findings from the DocEnhance survey of doctorate holders on their employment situation, skills match, and the value of the doctorate. Strasbourg: European Science Foundation (ESF) Available at: <https://docenhance.eu>

⁵ ESF, [*How to track Researchers' Careers. A report by the ESF MO Forum on European Alliance for Research Careers Development*](#) (ESF: Strasbourg, 2012), 4.

⁶ European Commission, [*Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on a European strategy for universities SWD\(2022\) 6 final*](#) (Luxembourg: Publications Office of the European Union, 2022).

⁷ ESF, [*How to track Researchers' Careers. A report by the ESF MO Forum on European Alliance for Research Careers Development*](#) (ESF: Strasbourg, 2012), 37-40.



- 3) Systemic level, ensuring policy planning and quality assurance in research by enhancing effectiveness and efficiency of doctorate training and by increasing capacity building for a better balance between supply and demand within the labour market.

Benefits of career-tracking surveys

The career-tracking surveys are important tools to track the quality of doctorate education, the professional paths of PhD graduates and the impact assessment at individual, institutional and systemic levels. Hereof, career tracking studies are useful for:

- 1) getting feedback from PhD holders working in the academic and non-academic sectors to continuously update training curricula, and to provide much-needed input for career counselling initiatives
- 2) gathering PhD graduates' contact information to maintain active local alumni networks and activities, and further facilitating future involvement of the non-academic sector in PhD education
- 3) enabling universities and alumni services to enlarge and exploit their professional networks, to get feedback on relevance of PhD curricula and to conduct better and more appropriate career counselling.

3. OVERVIEW OF CAREER-TRACKING SURVEYS

Career-tracking studies of doctorate holders can be organized at international/European, national and institutional levels.

International and European studies

At the international level, one should mention the OECD's work on careers of doctorate holders (2019)⁸ which has provided data on the labour market outcomes, mobility, and career pathways of PhD holders in the last 15 years. Despite the difficulties of compiling comparative information from the Member States, studies published by the OECD highlight the relevance of statistics concerning the place of PhD graduates into the labour market.

The European Union invited member States, according to the 2017 Council Recommendation, to establish graduate tracking systems for several objectives:

- 1) Strengthen career guidance for prospective students, current students and graduates.
- 2) Support the design and updating of curricula to improve the acquisition of relevant skills and employability.
- 3) Improve skills matching so as to support competitiveness and innovation at the local, regional and national levels, and to resolve skills shortages.

⁸ OECD, [OECD work on careers of doctorate holders](#) (Paris: OECD Publishing, 2019).



- 4) Plan for and forecast evolving employment, educational and social needs.
- 5) Contribute to policy development at both national and EU levels (EU, 2020, p. 8)⁹.

National surveys

At the national level, surveys are mostly conducted with a focus on relevant data for statistics on employment situation and analysis of doctoral landscape, the purpose being to get common information on PhD holders in a certain country or region. National surveys are a cost-effective way to gather comparable information from different institutions. One could mention for instance, the Italian Institute for Statistics¹⁰ (ISTAT), the German Centre for Higher Education Research and Science Studies¹¹ (DZHW), Wellcome Trust¹² or the Swiss Federal Statistical Office¹³ who are providing regular statistics on PhD holders' careers, whereas the French Ministry of Higher Education and Research¹⁴ has implemented since 2016 a national career follow-up study compulsory for all French higher education institutions every two years.

Surveys at the institutional level

At the institutional level, some initiatives mentioned:

- 1) The Autonomous University of Madrid¹⁵ (UAM) which collects data on employability and labour market penetration of the former PhD holders
- 2) The University of Turin¹⁶ that has investigated the benefits of doctorate education and motivation for research careers among PhD graduates during the last 10 years
- 3) The University of Leuven¹⁷ that is striving to increase the quality of doctorate programmes by analysing the outcomes of a survey focused on mentoring, supervision, and doctoral training
- 4) Karolinska Institute¹⁸ in Sweden that settled a survey to evaluate the benefits of the doctoral education for the labour market.

⁹ European Commission Expert Group on Graduate Tracking, [Towards a European graduate tracking mechanism](#) (Luxembourg: Publications Office of the European Union, 2020).

¹⁰ For more information, see: <https://www.istat.it/it/archivio/234817>.

¹¹ For more information, see: <https://www.dzhw.eu/en/index.html>.

¹² For more information, see: <https://wellcome.org/sites/default/files/wtp059281.pdf>.

¹³ For more information, see: <https://www.bfs.admin.ch/bfs/en/home.html>.

¹⁴ For more information, see: <https://www.enseignementsup-recherche.gouv.fr/pid24800/notes-d-information.htmlb>.

¹⁵ For more information, see: [https://www.uam.es/EscuelaDoctorado/\(en_GB\)-Encuesta_empleabilidad_final/1446802585434.htm?language=en_GB&nDept=5&nodepath=Survey%20on%20the%20Employability%20of%20Universidad%20%20Aut%C3%B3noma%20de%20Madrid%20Doctoral%20Degree%20Olders](https://www.uam.es/EscuelaDoctorado/(en_GB)-Encuesta_empleabilidad_final/1446802585434.htm?language=en_GB&nDept=5&nodepath=Survey%20on%20the%20Employability%20of%20Universidad%20%20Aut%C3%B3noma%20de%20Madrid%20Doctoral%20Degree%20Olders).

¹⁶ For more information, see: <https://drive.google.com/file/d/1hmrP-2N28hKJ3nVxJgS9CP0aY9rICcyU/view>.

¹⁷ For more information, see: <https://set.kuleuven.be/phd/international/exitpoll>.

¹⁸ For more information, see: <https://medarbetare.ki.se/media/7745/download>.



The European University Association – Council for Doctoral Education (EUA-CDE) published in 2020 a report on Tracking the careers of doctorate holders providing suggestions and recommendations to track research careers (EUA-CDE, 2020, p. 10-11)¹⁹. The report groups existing career-tracking initiative under four types based on their purpose and methodology : a) graduate surveys and exit pools; b) national graduate surveys; c) surveys based on registered data and finally d) digital alumni platforms. The report stresses that it is important to fully consider the purpose of the study to choose the best fitting methods to collect data on PhD graduates. The report discusses the advantages and disadvantages of each type of survey: e.g., low response rates in case of institutional or national surveys of PhD holders, as well as the lower reliability of data (based on respondents' perceptions or opinions) compared to e.g., register-based data on employment. On the other hand, institutional surveys allow for more fine-grained data to be collected compared to national surveys and register-based surveys, adapted to the needs of the participating institutions or programmes (e.g., on satisfaction with doctoral training, or its impact on careers), and enable to reach and collect data on PhD graduates who have moved abroad.

The European Science Foundation has been involved in career-tracking surveys since more than one decade. The reports concerning the *Research Careers in Europe. Landscape and Horizons*²⁰ (2009) and *How to Track Researchers' Careers*²¹ (2012) highlighted the necessity of researchers' careers and employability inside and outside academia, sharing good practices on implementation of career tracking. In 2015, the Pilot Project Report on Career Tracking of Doctorate Holders²² published the outcomes of a survey carried on in 5 European organisations, spotlighting the value of doctoral training and recommending future studies in the field. Two years later, the 2017 Career Tracking Survey of Doctorate Holders²³ conducted on behalf of nine partner organizations, allowed to further develop the questionnaire and the methodology. The purpose of the ESF pilots surveys was to coordinate institutional career-tracking surveys across several Higher Education Institutions, enabling the joint development of the questionnaire suitable for various institutional contexts, optimizing the costs related to the conduct of career-tracking surveys and enabling cross-intitutional collaboration and benchmarking across the participating institutions.

¹⁹ EUA-CDE, [Tracking the careers of doctorate holders. EUA-CDE Thematic Peer Group Report](#) (Brussels: EUA-CDE Publishing, 2020).

²⁰ ESF, [Research Careers in Europe. Landscape and Horizons](#) (ESF: Strasbourg, 2009).

²¹ ESF, [How to track Researchers' Careers. A report by the ESF MO Forum on European Alliance for Research Careers Development](#) (ESF: Strasbourg, 2012).

²² ESF, [Career Tracking of Doctorate Holders](#) (ESF: Strasbourg, 2015).

²³ ESF, [2017 Career Tracking Survey of Doctorate Holders](#) (ESF: Strasbourg, 2017).



4. DOCENHANCE SURVEY DESIGN AND ADMINISTRATION

In 2021, in the framework of the EU-funded DocEnhance project, a survey on career-tracking across nine participating universities in nice European countries was launched, the main idea being to collect relevant information from PhD holders to improve the current doctoral training in Europe and beyond. One of the modules of the survey focused on the skills training and use to provide valuable evidence for building a more employment- and innovation-orientated doctoral training curriculum. The survey also enabled the participating universities to better understand career paths of doctorate holders and added value of the doctorate.

4.1. OBJECTIVES AND TARGET POPULATION

This survey was carried out by the European Science Foundation-Science Connect (ESF-SC) on behalf of the following participating European universities: Arctic University of Norway (Norway), Technical University of Munich (Germany), Aristotle University of Thessaloniki (Greece), Maastricht University (Netherlands), NOVA University Lisbon (Portugal), Matej Bel University (Slovakia), University of Alcalá (Spain), University of Sassari (Italy) and University of Chemistry and Industry Prague (Czech Republic). The respondents were PhD holders who graduated from the participating universities between 2016 and 2020.

4.2. QUESTIONNAIRE DESIGN

The questionnaire was developed by the European Science Foundation, whereby the questionnaire developed for the previous studies conducted by ESF was further developed to focus on careers pathways both inside and outside academia and to explore further skills training and skills utilisation. The list of skills was enlarged in the light of the results of the DocEnhance project activities, such as workshops with regional stakeholders. Participating organisations actively contributed to provide comments, adapt, and adjust questions, the questionnaire being reviewed several times by the project partners. Moreover, the questionnaire was peer-reviewed by several experts in the fields of survey methodology and doctoral education, as well as representatives of stakeholder organisations. For better outcomes and feedback, the questionnaire was pre-tested internally by the staff at the European Science Foundation, and externally by the project partners, before the official launching.

The online questionnaire was hosted on a specialized subscription-based online survey platform used at ESF. The number of questions varied up to 68 questions depending on the profile of the respondents and skip logic applied (employed/unemployed, researcher/non-researcher, etc.), while the completion took from 15 to 20 minutes. The questionnaire was in English and included seven sections:

- 1) Doctorate education
- 2) Skills and competencies
- 3) Transition from doctorate to the first or next employment



- 4) Employment situation and related career experience
- 5) Intersectoral mobility
- 6) Geographical mobility and
- 7) Demographics.

The questionnaire is provided in Annex 1 of the present report.

4.3. GDPR AND SURVEY PROTOCOL

Before starting to fill out the questionnaire, respondents had to sign an informed consent form, presented in the Annex 2. The informed consent form was divided into two parts: 1) the information sheet (for sharing information about the purpose of research, type of research intervention, participant selection and voluntary participation, procedures and duration of the questionnaire, risks and benefits, confidentiality and sharing of results, right to refuse or to withdraw and contact to do it, if needed) and 2) the certificate of consent. Those who did not agree with the consent form, could not take part of the survey.

The survey was launched at the beginning of March 2021 and was open for five weeks. ESF has set up the survey in the online platform and provided each participating university was provided with the online link to survey and contacted their PhD graduates. In addition, the survey process including the timeline, actions and follow up (e.g., preparing the contact database, template messages of reminders to be sent, response monitoring) were provided to partners in the survey protocol. Initially the survey protocol foresaw two options for contacting the PhD graduates: 1) the email addresses and names of the PhD graduates from the participating universities are provided to the European Science Foundation for the purpose of the survey and 2) participating universities contact their PhD graduates directly using the link provided by the European Science Foundation. In view of GDPR regulations and arrangements, all partners opted for the second option, even though it involved more follow-up of the survey monitoring and coordination.

Participating universities were responsible of sending out the invitations and of taking care of bounced mails or optouts. The questionnaire link was sent to PhD graduates centrally at the university level or via Alumni services. One exception was the University of Thessaloniki, where the invitation to the survey was sent out by individual faculties since for the moment, as the university did not have a common database with personal contacts for the PhD graduates.

Moreover, to test a different approach of reaching PhD graduates, a weblink was created to be used by all partner universities on social media. The universities were asked to post the link on their social media account or dedicated alumni websites. The social media campaign however did not result in substantial number of responses. Contacting PhD graduates through central databases at the university level or alumni offices proved to be most effective. This presupposes two things: 1) data bases of email contacts are kept and updated with valid personal emails; and 2) the university has the possibility to contact the PhD graduates for such follow-up surveys after their graduation in full respect of data protection regulations.



5. LESSONS LEARNED AND RECOMMENDATIONS FOR CAREER-TRACKING SURVEYS

This section includes lessons learned from the DocEnhance career-tracking survey with regard to survey design, planning, legal aspect and data collection. These recommendations are mainly for universities or entities which would like to develop their own career tracking surveys of PhD graduates.

5.1. SURVEY FEASIBILITY AND CONTACT MANAGEMENT

To assess the feasibility of setting-up a career tracking survey, it is important to check if the university has a database of contacts of PhD graduates, including their names, valid personal emails, year of graduation and possibly other details. Without available contact data, it would not be possible to conduct a survey. In this case, the first step would be to set up such as database, in compliance with GDPR, by collecting email addresses from the PhD candidates currently enrolled in the doctoral programme, in view of future surveys.

Gathering, checking and updating contact emails has proven difficult task for some partner universities, which makes it important for universities to keep a regularly updated list with the PhD graduates' contact data. Therefore, the following recommendations are made:

- 1) Universities should strive to maintain a database of contact details of all PhD graduates, including the information on their faculty and year of graduation, in a centralised manner at the university level or at the level of the alumni office.
- 2) In addition to institutional email addresses, it is important to collect personal emails of the PhD candidates, as institutional emails are not regularly consulted upon graduation, and in some institutions, these are deleted 3-4 years after graduation.
- 3) To regularly update the email addresses of the PhD graduates with the help of Newsletters, engagement with alumni activities or other scientific events.

5.2 PLANNING AND PROJECT MANAGEMENT

Planning is key for a successful career-tracking survey : whether it is done as part of a coordinated effort with several organisations (as in the case of the DocEnhance survey) or as an institutional initiative, it important to set aside enough time, as well as human and financial resources, and to thoroughly plan for the various phases and professional project management: e.g., questionnaire development/adjustment and quality assurance from the methodological perspective, stakeholder relations (e.g. career services, IT, legal advisors, alumni officers, etc.), dealing with the GDPR aspects and preparing a data management plan, data cleaning and analysis, report preparation and dissemination. Having appropriate expertise (in-house or through a consultancy) in survey design and statistical analysis and software as well as coordination and management are important.



In the framework of the EU-funded project, the timeline was agreed in advance and partners were informed of their involvement in each work package. From the needs assessment to the publication of the final report on the data findings, the completion of the study took 18 months (although the launch of the survey was delayed due to the COVID-19 pandemic impact). The main steps of the survey are depicted below:

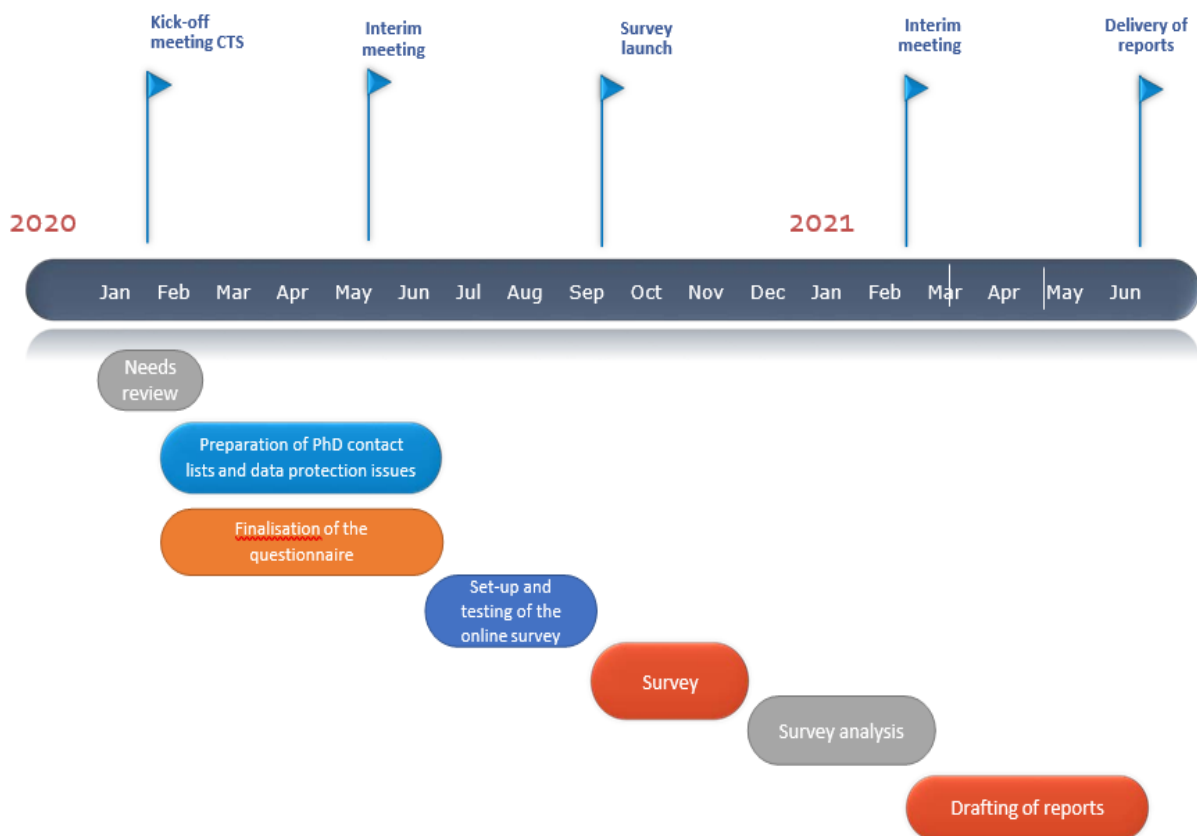


Fig. 1. DocEnhance career-tracking survey timeline

The European Science Foundation acted as the coordinator of the survey, and its tasks included:

- 1) Reviewing the needs of the participating organisations;
- 2) Designing the questionnaire and coordination of partners' and experts' feedback collection;
- 3) Designing the survey protocol;
- 4) Setting up and testing the survey in the online platform;
- 5) Coordinating joint data collection;
- 6) Performing data cleaning and data analysis;



- 7) Preparation of the reports with findings for individual institutions and the overall public report with the findings on the joint dataset.

In addition, Partners' tasks included the following:

- 1) Providing feedback on the questionnaire during the questionnaire design phase;
- 2) Preparation of a list of PhD contacts for the target period;
- 3) Contacting PhD graduates using the weblink to the online survey provided by the European Science Foundation and monitoring and tracking responses
- 4) After the data analysis and the compilation of the results, commenting on the draft report.

5.2. LEGAL ASPECTS

All universities and organizations carrying out a PhD graduates' survey are responsible for complying with the applicable international, EU and national laws (in particular, the GDPR²⁴, national data protection laws and other relevant legislation) on the protection of individuals with regard to the processing of contact and personal data. When carrying out a career-tracking survey, data privacy laws and regulations need to be respected while contacting PhD graduates and collecting data.

Contacting PhD graduates: respecting the GDPR regulations

As mentioned above, an important pre-condition for participating in the survey is the availability and accessibility of up-to-date contact information on PhD graduates that is needed for sending of the questionnaire and monitoring (e.g. response rate, reminders to non-respondents) of the survey.

Another important point to respect the applicable data protection regulation when contacting the PhD graduates – whether it is done by the University directly or via a third party responsible for the study. In the DocEnhance project, the survey was carried out by ESF on behalf of the participating universities, and therefore, two options were available to contact the alumni: 1) University transfers the PhD graduates contact data to ESF which will handle the survey centrally, and 2) University sends the link to survey to their PhD alumni directly and monitors the survey. The two options as well as the suggestions as far as the GDPR aspects of handling of the PhD graduates contacts were provided by the ESF to the partner universities in an official invitation to participate in the survey. For the purpose of the current document, the two options are outlined below in case universities opt for sub-contracting a third party to carry out a career-tracking survey.

²⁴ European Union, 2016 [Directive Regulation \(EU\) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC \(General Data Protection Regulation\)](#) (Luxembourg: Publications Office of the European Union, 2020).



Option 1: University sends the PhD graduate list including name, surname, year of graduation and contact email to third party in charge of the survey

Both the University and third party are considered as data controllers – as they both decide what is the purpose or outcome of the data processing. With regard to GDPR, the following options need to be considered:

- If the initial purpose of collecting the PhD graduates' email addresses by the University is to « contact the alumni to follow up after the graduation » or something similar, the action should be based on the reason mentioned. Then the University should inform their PhD alumni of the fact that the selected third party will get in touch with them for this purpose of the career-tracking survey. The contractor will contact them « on behalf of » the University and explain how they received their email address and will also provide the opportunity to the person to opt-out from the study.

- If the university never mentioned the purpose when they collected PhD graduates' email addresses, then there are other options to be able to transfer the contacts to the third party for the survey management – to be explored with the University legal advisor:

1) Getting explicit consent

Getting explicit consent of your PhD alumni to transfer email address to a third party should be done via an explicit statement of consent. It should be easy to withdraw consent, and evidence should be kept of this process. It has to be noted that by asking explicit consent, the University risks "losing" many potential respondents thus limiting the sample.

3) Legitimate interests grounds

This is most appropriate where person's data is used in ways they would reasonably expect and which have a minimal privacy impact, or where there is a compelling justification for the processing. In this case, contacting alumni to follow up their careers is something reasonable and expectable from a doctoral training institution. If the university chooses to rely on legitimate interests, they are taking on extra responsibility for considering and protecting people's rights and interests (e.g. security, confidentiality).

Option 2: University sends the link to the online questionnaire directly to their PhD graduates and does their own survey monitoring

Where it is not possible to transfer PhD contact data from the University to a third party, it is still possible for a University to work with a third party by sending the survey link and all communication directly to their graduates through institutional channels. This was also the option preferred by the DocEnhance partner universities due to GDPR constraints, and therefore no contact lists of PhD holders with their personal data were transferred to ESF. This option means that some of the tasks for the survey management need to be carried out by the participating University: e.g., sending bulk emails to PhD graduates, monitoring and documenting the response rates regularly, dealing with failed emails and opt-outs and their follow up, and sending up reminders.



To conclude, before setting up a career-tracking survey, there are some aspects to bear in mind:

- 4) Organisations are responsible for respecting the GDPR regulation at the European, national, and institutional level for guaranteeing the respect of personal data; contacting a university data protection officer or legal advisor is necessary to explore the possible ways to contact the PhD alumni or to transfer PhD alumni personal data to a third party for the purpose of the survey.
- 5) Some organisations require to first obtain the explicit consent from the graduates to contact them for a follow-up career-tracking survey after graduation. Other organisations only institutional emails which may have become outdated or not used. Ideally, at the moment of collecting PhD candidates' personal contact details (e.g., collecting their personal email address when enrolling, before graduation or when for instance becoming member of university's alumni organisation), explicit consent should be sought to be able to contact graduates in the future by the university or a designated third party.
- 6) Personal data, including personal email addresses, need to be stored and used in compliance with legal and regulatory requirements.

Data collection: informed consent and handling of personal data

The survey collected only minimal personal data (gender, age and occupation) on the PhD graduates needed for the analysis. All survey participants were informed about the data protection and confidentiality arrangements.

The staff involved were responsible to handle the PhD graduates' data accurately, securely, confidentially, anonymously, and process it in accordance with the data subject's rights. All information was stored in a confidential manner and in accordance with the EU Directive 95/46/EC regarding use of personal data. It was ensured that the following requirements will be met:

- Confirmation that data was collected on a need to know basis only;
- The guarantee of withdrawal rights and oblivion rights as made compulsory by the European court of justice in 2014;
- Avoidance of merging data sets in order to prevent any unforeseen personal information disclosure
- Provision of detailed information on the procedures that will be implemented for data collection, processing, storage, protection, retention and destruction in addition to confirmation that they comply with national and EU legislation.

Before answering the questionnaire, the respondents were provided an informed consent form which consisted of:

- 1) Information sheet with survey description: purpose of the research, type of research intervention, voluntary participation, procedures and duration, risks and benefits, confidentiality and sharing of the results, right to refuse or withdraw and contact information, if needed.
- 2) Certificate of consent, which was set up as the first question of the survey.



Any potentially identifying personal data collected (e.g., year of graduation, gender, number of children, country of citizenship, etc.) were only used for statistical analysis of aggregate trends, research, and evaluation purposes. The participation in the survey was voluntary and respondents had the right to withdraw at any time, to answer as many or as few questions as they wished, and to contact the European Science Foundation Data protection Officer for any ethical or data protection questions. Participants were also asked if they agree to be contacted again in the future for follow-up surveys and in such a case provided their contact email address. The European Science Foundation processed and stored the contact data according to European and national legislation and kept this data separate from the data set used for the analysis. The emails provided by the PhD holders in the purpose of a follow-up survey were collected on a voluntary basis.

Some lessons learnt:

- 1) Integrating the informed consent form into the online survey as first question of the questionnaire proved to have worked well. The link to the Full Consent form was also made available.
- 2) Collecting no personal data (e.g., name, date of birth, thesis title) and minimal potential identifying data is advisable and is likely to increase response rates and to enable respondents to truthfully answer questions e.g. on satisfaction with their doctoral training programme. However, the disadvantage of fully anonymous surveys is that it is not possible to follow up the same respondents with future surveys, if the goal is to track their career paths in the future. It is possible, at the end of the survey, to ask respondents for a contact email (on a voluntary basis) in view of future surveys, as was done with the DocEnhance survey.

5.3. OBJECTIVES AND METHODOLOGICAL DESIGN

It is important to bear in mind that each survey has its own objectives and characteristics and implicitly, it is addressed to a specific and targeted population and has an appropriate set of questions. The scope of the survey needs to be carefully considered, as well as the method and expected outcomes. One needs to take into consideration the available resources, including the budget and staff and expertise.

It has to be checked whether at national or regional level there exist surveys collecting similar data. Other universities and organisations also conduct similar studies, and it is important to research what is being available - there is no need to duplicate efforts designing a new questionnaire where good examples exist elsewhere. The DocEnhance questionnaire and approach can also be used as a template for institutional career-tracking surveys, to be adapted to the particularities of an individual institutional context.

As far as the type of survey of PhD graduates to be conducted, universities can consider several options: cross-sectional retrospective studies that trace back careers over several years; cohort studies; longitudinal panel study; cross-sectional retrospective study composed of consecutive



cohorts. If the university already has available data/registers, it may influence the choice of the type of study and methodology.

In the DocEnhance survey, the objective was to survey PhD graduates up to 5 years after PhD completion, and to explore issues such as first employment, current employments, moves across sectors of employment and in and out research, added value of PhD, satisfaction with their doctoral training and employment, match between their degree and their job, skills match, job satisfaction, etc. The DocEnhance survey target population included both early graduates (1-2 years after graduation) and those with more employment history after PhD (3-5 years after graduation). Having a sample of PhD graduates of e.g. up to 7-10 years of completion would have allowed to provide a richer data, including those with more career history. However, the 5-year period was selected due to constraints across participating organisations with regard to the availability of the PhDs' contact data. Respondents were asked to provide their contact data if they agree to be contacted at later stages, so that participating universities could also evaluate their career progression at later periods after PhD.

Longitudinal surveys, where a sample of PhD graduates is traced at several moments in time (e.g. at graduation, 1 and 3 or more years after graduation) are more time consuming and costly if set-up by individual institutions. However, the advantage is that dedicated questionnaires could be developed for the various stages (e.g., a questionnaire on satisfaction with doctoral training at graduation, questions on the entry into the labor market at 1 year after PhD, and questions on occupational career patterns at 3 or more years after PhD, etc.).

The DocEnhance questionnaire did not aim to evaluate specific courses or elements of doctoral training but collected information on how respondents valued their PhD in retrospect and what skills trainings they took as part of their PhD. The main goal of the questionnaire was to explore their employment situation (sector, type of contract, engagement or not in research, etc.) and PhD and PhD-level skills relevance and value for their career.

Keeping in mind that career-tracking surveys are labour- and cost-intensive, having several organisations take part in the study enabled economies of scale and also offered benefit in terms of exchange on e.g. the questionnaire design. Having several organizations use the same questionnaire also generates possibilities for cross-institutional benchmarking using the collected data. Having the survey set up and carried out online (rather than conducted by phone or using paper questionnaires for instance) was selected because of its advantage in terms of cost and time flexibility for the respondents.

5.4. RESPONSE RATE

Having a good response rate is reportedly one of the biggest issues when it comes to a career-tracking surveys of PhD graduates. The EUA working group on Career-tracking²⁵ discussed advantages and disadvantages of the various methods for tracking careers of PhD holders, noting

²⁵ EUA-CDE European University Association Council for Doctorate Education. (2020). *Tracking the careers of doctorate holders. EUA-CDE Thematic Peer Group Report*. Brussels: EUA-CDE. Available at: https://eua.eu/downloads/publications/eua-cde%20tpg_web.pdf



that both graduate surveys run by Higher Education Institutions and national statistical offices or institutes run the risk low response rates due to survey fatigue, with most having 10-30% response rates. This is also due to the lack of up-to-date contact details of the PhD alumni.

In the DocEnhance survey, the overall response rate across all participating organisations was in a similar range, reaching 23% of the target population, that is, all those who received the survey invitation (sample size) and represented 21% of all graduates of the real objective population. The response rate differed from organization to organization, reaching at maximum 32%.

Having a coordinated approach to the survey, involving several institutions, has proven to be a good approach and enabled the creation of visibility and momentum for the survey. In addition, to reach a good response rate, there are several suggestions from the experience of the DocEnhance survey team:

- 1) Provide good rationale for the survey so that respondents understand the importance of the study for the university in the survey introduction message.
- 2) Have the invitation message signed by the University representative and build on the PhD graduate's relationship with the university.
- 3) Provide up to 2-3 reminders, one or two weeks after survey launch.
- 4) Keep the survey open for a period of up to 4 weeks and provide the possibility to start and continue filling out the survey at a later time.
- 5) Provide clear indication of the time it will take to fill out the survey (15-20 minutes maximum).
- 6) Provide clear indication on the GDPR aspects (e.g. how personal data will be handled).
- 7) Offer incentives: e.g., offering to send out survey report to respondents.

5.5. SAMPLING

The DocEnhance survey aimed to collect data from all doctorate holders in the target population (i.e. all PhD graduates for the 5-year period) and therefore used a census-like approach without any specific statistical sampling. This approach has an advantage of obtaining information from a larger number of respondents and the absence of statistical and technical issues related to sample selection. However, because not all doctorate holders in the target population were reached and/or responded to the survey, we can still refer to participating individuals as the sample of doctorate holders.

5.6. QUESTIONNAIRE

The questionnaire is provided in Annex 1, including all questions and answer options. Despite the length of the questionnaire (up to 68 questions depending on the skip logic), the survey completion rate was rather high, at 80%, indicating that the survey was generally well adapted in terms of content and size.

The questionnaire includes mainly closed questions with several answer options to choose from. The survey offered "other" as one option to ensure that all respondents could answer appropriately. In most cases, the proportion of respondents selecting "other" was small (less than



10%), indicating that the options offered were mostly well-suited to the doctorate holders responding to the survey. Upon data analysis, some improvements to the questionnaire can be considered:

- More appropriate answer options could be offered on current employment position (Q27: *Which of the following best describes your current main employment status? Please note that the term 'employed' includes postdoctoral positions*). Exceptionally, a relatively large proportion (20%) of survey respondents that selected "other" as their main position of employment, rather than one of the positions offered as potential options. This was particularly true for those not engaged in research or non-academic positions, 38% of whom responded "other" (compared to 12% of those engaged in research). Based on the most common responses specified under "other", we suggest that future similar surveys include the following positions as options: teacher, medical practitioner, consultant, CEO or senior management, laboratory staff, policy/health/scientific/economic advisor, IT specialist (including software engineers and data analysts), product manager, patent attorney.
- The options that were offered for this question on the current employment position could also be reduced. Based on the approximately equal split of respondents selecting the different options that were offered, this could probably be done by consolidating rather than removing options. For example, a future sample could combine associate, assistant, and future professor, as well as researcher and senior researcher. These options interrogated seniority more than the nature of the work conducted by the respondent, and this aspect was probably addressed more specifically anyway by the question on researcher level according to the European Framework for Research Careers. We would also suggest improving and harmonizing the type of positions which give us the opportunity to make analysis not only by sector, but also by type of positions.
- Another example is regarding the question: "Did you have a paid job before or during your doctorate?", which could also have been misunderstood by some respondents as the doctorate itself, not like a job next to or other than, the doctorate itself. The low share of respondents (20%) who indicated that their doctorate was funded by contracted employment with the university leads us to assume that the majority meant a job other than doctorate when replying to this question. For future surveys it would be important to specify this question more.
- The same scenario happened with the notion of "collaboration" between academic and non-academic sectors. This aspect could be improved in the future by providing a precise definition of the concept and concrete examples of the various types of collaboration.
- In addition to asking whether or not respondents are involved in research as part of your current job, one could consider a more nuanced question – e.g., to what extent they are involved in research (as regards a percentage share of their time).

For future surveys, additional questions can also be considered. For instance, while the



questionnaire includes the question on the minimum required education level for the current job, (Q30 – *What was the minimum education or experience level requirement for your current main job?*) it would be useful to add a question to explore whether having a PhD was essential, desirable or not useful when getting the current job.

For respondents working in positions not requiring a PhD or not involved in research, it would have been good to explore whether this was by choice or for the lack of better option, to facilitate the analysis. Moreover, it would be useful to explore further to what extent different skills were acquired (according to PhD graduates) - during the training programme, or in workplace.

6. CONCLUSIONS

The survey of PhD holders carried out by the European Science Foundation in the framework of DocEnhance EU-funded project served as a pilot tool for participating universities to collect valuable data on the careers of the PhD graduates, as well as their employment situation, skills training and utilization. This information proved to be important for internal quality assurance mechanisms at the participating universities and would also serve as a tool to adjust the transferable skills training curricula during the doctorate education to help PhD holders to enter the labour market, either inside or outside academia. In this light, the present report shared the main lessons learnt from this pilot exercise for the practical implementation of a career-tracking regarding the survey design, planning, survey management and legal aspects.

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8. ANNEXES

8.1. ANNEX 1: QUESTIONNAIRE TEMPLATE

DocEnhance Career-Tracking Survey of Doctorate Holders

INTRODUCTION

AIMS OF STUDY

Thank you for responding to the DocEnhance Career Tracking Survey of doctorate holders. This survey is conducted in the framework of the EC-funded [DocEnhance](#) project. The project aims at enhancing existing doctorate programmes by providing a more career-oriented curriculum for doctorate programmes.

This survey is carried out by the [European Science Foundation-Science Connect](#) (ESF-SC) on behalf of the eight participating European universities.

You have been invited to take part in the survey because you have graduated from one of the participating universities between 2016 and 2020.

It should take you between 15 and 25 minutes to fill out, depending on your career path. If interrupted, you can return to the survey later and pick up from where you left it.

We greatly appreciate your input to this survey, which will enable us to better understand career paths of doctorate holders, including skills utilisation and added value of the doctorate.

INFORMED CONSENT FORM

You can download the Informed Consent Form for more information [here](#).

The answers will be anonymised. Any potentially identifying personal data collected by the survey such as the year of birth, gender, or citizenship are only used for statistical analysis



of aggregate trends. The data collected will be used for research and evaluation purposes. It will only be made available to institutions and other researchers anonymously.

Your participation in this research is voluntary. You do not have to take part in this research if you do not wish to do so, and you may withdraw from the survey at any time.

The final report will be made widely available to the public via the [DocEnhance website](#).

If you have any questions about the survey or the project, please write to the DocEnhance survey coordinator, **Julia Boman** at jboman@esf.org. If you have any ethical or data questions, please address them to the ESF Data Protection Officer, **Isabelle Vonesch** at database@esf.org.

Certificate of Consent

I have been invited to participate in a career-tracking survey designed for doctoral graduates from European universities. I am willing to participate in this study and have read the foregoing information. I have had the opportunity to ask questions about the study and any questions I have asked, have been answered to my satisfaction. I consent voluntarily to be a participant in this study.

1. **Do you agree with the above terms? If you select NO, you will exit this questionnaire**
 - Yes, I have read and give my consent to the terms mentioned in the Informed Consent Form
 - No, I do not accept the terms of the Informed Consent Form

If participant select YES, go to Section 1

If participant select NO, exit survey

SECTION 1: DOCTORAL EDUCATION AND TRAINING

2. **In which year did you start your doctoral training programme (formal admission)? If you have more than one doctorate, refer to the one completed within the period 2016-2020.**

Dropdown menu 2000 or earlier; 2000-2020

3. **In which year did you defend your doctorate?**

Dropdown menu 2010 or earlier; 2011-2020



4. In which country was your doctorate awarded?

Dropdown menu for Country Selection

5. Please select the field that best corresponds to your doctorate.

- **Natural sciences** (Mathematics, Computer and Information Sciences, Physical Sciences, Chemical Sciences, Earth and related Environmental Sciences, Biological Sciences, other Natural Sciences)
- **Engineering and technology** (Civil Engineering, Electrical, Electronic and Information Engineering, Mechanical Engineering, Chemical Engineering, Material Engineering, Medical Engineering, Environmental Engineering, Environmental Biotechnology, Industrial Biotechnology, Nanotechnology, other engineering and technologies)
- **Medical and health sciences** (Basic Medicine, Clinical Medicine, Health Sciences, Medical biotechnology, other medical sciences)
- **Agricultural sciences** (Agriculture, forestry and fishery, Animal and dairy Science, Veterinary Science, Agricultural biotechnology, other agricultural sciences)
- **Social sciences** (Psychology, Economics and Business, Educational Sciences, Sociology, Law, Political Science, Social and Economic Geography, Media and Communications, other Social Sciences)
- **Humanities** (History and Archaeology, Language and Literature, Philosophy, Ethics and Religion, Arts, other Humanities)

6. Which of the following were your financial sources during your doctoral training period? Please select all that apply.

- Fellowship from your university
- Contracted employment with your university
- Fellowship from government or public research fund
- Fellowship from private sector, or a private not-for-profit organisation
- Fellowship from international institutions
- University position/teaching and/or research assistantship
- Job not related to the doctorate
- Non-funded
- Other (please specify)



7. In addition to the university where you obtained your doctorate, did your doctorate take place in collaboration with any other organisation (e.g. external co-supervision, industrial partner, additional training, etc.)?

- No
- Yes, with another university (joint doctorate – *cotutelle*, etc.)
- Yes, with a university of applied sciences
- Yes, with a non-university research institution
- Yes, with a private sector company (e.g. industrial doctorate)
- Yes, with a third sector organisation (e.g. NGO, charity, not-for-profit)
- Yes, with another organisation (please specify):

8. Was your doctorate mainly achieved through structured training programme or individually supervised research?

- Structured training programme** (graduate school/doctoral programme with specific elements such as taught courses, milestones, mobility options etc.)
- Individually supervised research** (doctoral education is led by individual supervisors with no institutional oversight)

9. What motivated you to pursue a doctorate? Please select all that apply.

- To work as a researcher in academia
- To work as a researcher outside academia
- To work as a highly skilled expert
- To diversify career opportunities
- Personal accomplishment
- Interest in the research topic
- Social recognition
- Other (please specify)

10. How satisfied are you with the following aspects of your training while doing your doctorate?

(1 = very dissatisfied; 2 = somewhat dissatisfied; 3 = neither satisfied nor dissatisfied; 4 = somewhat satisfied; 5 = very satisfied; not applicable)

- Quality of research training (e.g. methodological skills, subject knowledge, etc.)
- Quality of transferable skills training (e.g. communication, project management, research ethics and integrity, entrepreneurship, etc.)
- Services for doctoral candidates at your university (e.g. career support, library provision, IT, etc.)
- Supervision provided by the supervisor(s)



- Support to pursue an academic career (e.g. teaching experience, engagement in research grants, etc.)
- Support to pursue a non-academic career (e.g. networking with non-academic partners, etc.)

11. Looking back, if you could make the decision about doing your doctorate again, which of the following would you most likely choose?

- The same doctorate at the same institution
- A different doctorate at the same institution
- The same doctorate at another institution
- A different doctorate at another institution
- Not to do a doctorate at all.

12. Have you done any research stay(s) abroad while doing your doctorate?

- Yes
- No

SECTION 2: SKILLS AND COMPETENCIES

13. During your doctorate, did you receive training in transferable skills (e.g. communication, management, research ethics and integrity, etc.) at your university?

- Yes, trainings were mandatory
- Yes, trainings were optional
- No, trainings were optional
- No, no trainings were available

If the respondent received training in transferable skills, then go to question 14

If the respondent didn't receive training in transferable skills, then go to question 15

14. Which training(s) did you receive at your university during your doctorate? Please select all that apply.

- **Research skills (e.g. subject knowledge, methodology)**
- **Other academic competences** (e.g. research ethics and integrity, teaching/mentoring)
- **Personal skills** (e.g. personal effectiveness)
- **Professional skills** (e.g. team working, negotiation)
- **Communication skills** (e.g. effective communication, intercultural skills)
- **Management skills** (e.g. project management, data stewardship)



- Other (please specify)

15. How would you rate your research skills and other academic competences at the time you completed your doctorate?

(1 = Very poor; 2 = Poor; 3 = Fair; 4 = Good; 5 = Very good)

SUBJECT KNOWLEDGE: demonstrating a theoretical and practical understanding of your subject area and its wider research context

METHODOLOGY: applying research methodologies, tools and techniques appropriately

INTELLECTUAL PROPERTY: understanding how to manage Intellectual Property rights, e.g. how to file a patent, how to share work via Creative Commons licensing

RESEARCH VALORISATION, ENGAGEMENT, AND INNOVATION: considering potential societal impact of research, engaging with non-academic actors and developing new ideas, processes or products, which are rooted in research

RESEARCH ETHICS AND INTEGRITY: understanding principles, rules, values and professional standards governing research for ensuring scientific rigor, honesty, trust and confidence

TEACHING/MENTORING/SUPERVISION: using appropriate tools and methods to facilitate learning and assessment, to encourage and support learners developing their potential

16. How would you rate your personal skills at the time you completed your doctorate?

(1 = Very poor; 2 = Poor; 3 = Fair; 4 = Good; 5 = Very good)

CRITICAL-ANALYTICAL THINKING: critically analysing and evaluating findings and results

PROBLEM SOLVING: formulating and applying appropriate solutions to problems and challenges

CREATIVITY: being imaginative, thinking out of the box and developing new insights

FLEXIBILITY: responding quickly to changes and adapting easily to new situations

PERSONAL EFFECTIVENESS: making use of the resources at your disposal (e.g. time, skills and talents) to achieve professional and personal goals



RESILIENCE: ability to cope with and overcome challenges and setbacks on a daily basis, including adaptation to change

17. How would you rate your professional skills at the time you completed your doctorate?
(1 = Very poor; 2 = Poor; 3 = Fair; 4 = Good; 5 = Very good)

TEAM WORKING: working constructively with colleagues, acknowledging their contribution

ENTREPRENEURSHIP: ability and willingness to develop, organise and manage a business venture along with its risks

NETWORKING: developing, maintaining and using networks or collaborations

NEGOTIATION: ability to discuss, communicate and cooperate for reaching an agreement

SELF-BRANDING: ability to properly identify your personal skills and to communicate them to different audiences

18. How would you rate your communication skills at the time you completed your doctorate?

(1 = Very poor; 2 = Poor; 3 = Fair; 4 = Good; 5 = Very good)

EFFECTIVE COMMUNICATION: communicating information effectively and confidently to different audiences

LANGUAGES: communicating effectively in a language other than your mother tongue

INTERCULTURAL SKILLS: having acquired cultural sensitivity and openness to other cultural horizons and viewpoints

DIGITAL COMMUNICATION: using newest digital tools to undertake, manage and promote research, products or goals to the public

19. How would you rate your management skills at the time you completed your doctorate?

(1 = Very poor; 2 = Poor; 3 = Fair; 4 = Good; 5 = Very good)



PROJECT MANAGEMENT: effectively planning, managing and delivering projects on time

CAREER MANAGEMENT: actively manage your professional development

DATA STEWARDSHIP: handling information and knowledge to facilitate their management, ensuring data meets FAIR standards

SECTION 3: TRANSITION FROM DOCTORATE TO THE FIRST OR NEXT EMPLOYMENT

20. Did you have a paid job before or during your doctorate?

- Yes
- No

21. Did you have a paid job at any time after completing your doctorate (including postdoctoral positions)?

- Yes
- No

If the respondent had a job at any time after completing their doctorate, then go to the question 22

If the respondent didn't have a job at any time after completing their doctorate, then go to Section 4.

22. Approximately how many months passed between the time you completed your doctorate and your first or next paid job? If you were already employed when you graduated, select "0"

Dropdown menu – 0 to 60 months

If the respondent had a job at any time after completing their doctorate, then go to the question 22

If the respondent didn't have a job at any time after completing their doctorate, then go to Section 4.



23. How important were the following resources when looking for your first or next job after finishing your doctorate?

(1 = not at all important; 2 = slightly important; 3 = moderately important; 4 = very important; 5 = extremely important)

- Academic Advisor/Supervisor
- University Career Centre
- Job advertisements in Department/University
- Peers (e.g. colleagues, alumni, labour unions, associations)
- Personal contacts
- Web search/online job portal
- Job/career fairs
- Previous job, work placement or internship
- Social and professional networks
- Please list any other important resources:

24. Did you take one or more postdoctoral positions at a university or a research performing organisation after obtaining your doctorate?

- Yes
- No

*If the respondent took one or more postdoctoral positions, then go to the question 26
If the respondent didn't take a postdoctoral position, then skip to the question 28*

25. How many postdoctoral positions did you take?

- 1
- 2
- 3 or more

26. To what extent do you agree or disagree with the following statements?

(Strongly agree, Agree, Neither agree, nor disagree, Disagree, Strongly disagree)

- My doctorate properly prepared me for my first job
- My doctorate enabled me to progress towards my desired career
- It was clear to me what career opportunities I could aspire to after my doctorate
- The transition to my first job after doctorate was difficult
- Having a doctorate made no difference to my career path

SECTION 4: EMPLOYMENT AND CAREER RELATED EXPERIENCE



27. Which of the following best describes your current main employment status? Please note that the term 'employed' includes postdoctoral positions.

- Permanent Full-time Employed (30 hours per week or more)
- Permanent Part-time Employed (less than 30 hours per week)
- Temporary Full-time Employed (30 hours per week or more)
- Temporary Part-time Employed (less than 30 hours per week)
- Self Employed
- Retired
- Unemployed
- Full-time study
- Internship
- Career break (including childcare, elderly people care)
- Other, (please specify)

If the respondent is currently employed full-time or self-employed, then go to the question 28

If the respondent is in career break, then go to the question 46

If the respondent is not in employment (i.e. retired, unemployed, full-time study, internship), then skip to Section 6

28. Please indicate the sector which best describes your current main employment

- University
- Research organisations (e.g. research institutes)
- Business sector: industry
- Business sector: services and other
- Government or another public sector
- Healthcare sector (e.g. hospital, clinical centre)
- Non-higher education (e.g. secondary education)
- Private not-for-profit sector
- Other (please specify)

29. Please indicate your main position.

- Postdoctoral position/early career researcher
- Research Fellow/Researcher
- Lecturer
- Senior Researcher
- Assistant Professor/Junior Professor
- Associate Professor/Reader
- Full Professor
- Director, Head of Unit
- Analyst, Specialist



- Technician
- Engineer
- Project Manager
- Coordinator
- Other (please specify)

30. What was the minimum education or experience level requirement for your current main job?

- Bachelor or lower
- Master
- Doctorate
- Postdoctoral level
- Other (please specify)

31. To what extent is the content of your work in your current main job related to the thematic field of your doctorate degree?

- Closely related
- Partly related
- Not related

32. In your current main job are you engaged in research? The Frascati Manual defines researchers as professionals 'engaged in creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications'.

- Yes
- No

If the respondent is not engaged in research in the main current job, then go to the question 33

If the respondent is engaged in research in the main current job, then go to the question 34

33. Please rate the importance of the following reasons for not working as a researcher (1 = not at all important; 2 = slightly important; 3 = moderately important; 4 = very important; 5 = extremely important)

- Availability of job positions/offers not focused on research
- Interest in a non-research career
- Unavailability of a suitable research post or position
- Difficulty securing a tenured/permanent research post or position
- Bigger variety of career paths
- Better income



- Personal/family reasons
- Other important reason(s):

Redirect to question 37

34. At which level do you work (as per European Framework for Research Careers)?

- R2 Recognised Researcher (Doctorate holders or equivalent who are not yet fully independent)
- R3 Established Researcher (researchers who have developed a level of independence, e.g. publishing papers as lead author or leading collaborative research projects)
- R4 Leading Researcher (researchers leading their research area or field)

35. Which of the following activities do you perform as part of your main job? Please select all that apply.

- Research performing activities (including publications)
- Teaching/mentoring/supervision activities
- Administrative activities
- Staff management responsibilities
- Budget management responsibilities
- International partnerships
- Entrepreneurship, start-up activities
- Communication or scientific journalism
- Artistic creation
- Other (please specify)

36. To what extent are the following research skills and other academic competences important in your current main job?

(1 = not at all important; 2 = slightly important; 3 = moderately important; 4 = very important; 5 = extremely important)

SUBJECT KNOWLEDGE: demonstrating a theoretical and practical understanding of your subject area and its wider research context

METHODOLOGY: applying research methodologies, tools and techniques appropriately

INTELLECTUAL PROPERTY: understanding how to manage Intellectual Property rights, e.g. how to file a patent, how to share work via Creative Commons licensing

RESEARCH VALORISATION, ENGAGEMENT, AND INNOVATION: considering potential societal impact of research, engaging with non-academic actors and developing new ideas, processes or products, which are rooted in research



RESEARCH ETHICS AND INTEGRITY: understanding principles, rules, values and professional standards governing research for ensuring scientific rigor, honesty, trust and confidence

TEACHING/MENTORING/SUPERVISION: using appropriate tools and methods to facilitate learning and assessment, to encourage and support learners developing their potential

37. To what extent are the following personal skills important in your current main job?
(1 = not at all important; 2 = slightly important; 3 = moderately important; 4 = very important; 5 = extremely important)

CRITICAL-ANALYTICAL THINKING: critically analysing and evaluating findings and results

PROBLEM SOLVING: formulating and applying appropriate solutions to problems and challenges

CREATIVITY: being imaginative, thinking out of the box and developing new insights

FLEXIBILITY: responding quickly to changes and adapting easily to new situations

PERSONAL EFFECTIVENESS: making use of the resources at your disposal (e.g. time, skills and talents) to achieve professional and personal goals

RESILIENCE: ability to cope with and overcome challenges and setbacks on a daily basis, including adaptation to change

38. To what extent are the following professional skills important in your current main job?
(1 = not at all important; 2 = slightly important; 3 = moderately important; 4 = very important; 5 = extremely important)

TEAM WORKING: working constructively with colleagues, acknowledging their contribution

ENTREPRENEURSHIP: ability and willingness to develop, organise and manage a business venture along with its risks

NETWORKING: developing, maintaining and using networks or collaborations



NEGOTIATION: ability to discuss, communicate and cooperate for reaching an agreement

SELF-BRANDING: ability to properly identify your personal skills and to communicate them to different audiences

39. To what extent are the following communication skills important in your current main job?

(1 = not at all important; 2 = slightly important; 3 = moderately important; 4 = very important; 5 = extremely important)

EFFECTIVE COMMUNICATION: communicating information effectively and confidently to different audiences

LANGUAGES: communicating effectively in a language other than your mother tongue

INTERCULTURAL SKILLS: having acquired cultural sensitivity and openness to other cultural horizons and viewpoints

DIGITAL COMMUNICATION: using newest digital tools to undertake, manage and promote research, products or goals to the public

40. To what extent are the following management skills important in your current main job?

(1 = not at all important; 2 = slightly important; 3 = moderately important; 4 = very important; 5 = extremely important)

PROJECT MANAGEMENT: effectively planning, managing and delivering projects on time

CAREER MANAGEMENT: actively manage your professional development

DATA STEWARDSHIP: handling information and knowledge to facilitate their management, ensuring data meets FAIR standards

41. How satisfied are you with the following aspects of your main current working environment?



(1 = very dissatisfied; 2 = somewhat dissatisfied; 3 = neither satisfied, nor dissatisfied; 4 = somewhat satisfied; 5 = very satisfied; not applicable)

- Skills development
- Career growth opportunities
- Intellectual challenge
- Autonomy and responsibility
- Reputation of organisation
- Organisational culture
- Job security/stability
- Salary
- Mentoring and training
- Work/life balance
- Other important aspect(s):

42. What is your annual gross income (before deductions)?

- Under €5,000
- €5,001-€10,000
- €10,000-€15,000
- €15,001-€20,000
- €20,001-€25,000
- €25,001-€30,000
- €30,001-€40,000
- €40,001-€60,000
- €60,001-€85,000
- €85,001-€100,000
- €100,001-€150,000
- €150,001-€200,000
- Over €200,000
- Prefer not to say

43. How important were the following reasons for taking your current main position?

Please rate their importance to you when making the decision

(1 = not at all important; 2 = slightly important; 3 = moderately important; 4 = very important; 5 = extremely important)

- To take the next step in my desirable career path
- To improve/gain new skills
- To work with a specific person, organisation or company
- It was the only acceptable employment I could find at the time
- Intellectual challenge
- Autonomy and responsibility
- Salary
- Job security/stability



- Work/life balance
- Reputation of organisation
- Family/personal reasons
- Other important reason(s):

44. To what extent would you say that your doctorate contributed to the following in your working life?

(1 = not at all; 2 = a little; 3 = a moderate amount; 4 = a lot; 5 = a great deal; not applicable)

- Improved my skills and competencies
- A higher salary
- More interesting job assignments
- More demanding job assignments
- Better status at my place of work
- A job with a new employer
- A better position on the labour market
- Starting my own business

45. Did you take a career break (e.g. maternity/paternity leave, sickness) or have any time without a job (e.g. unemployment) since the completion of your doctorate? Please consider both intentional and unintentional career breaks.

- Yes
- No

If the respondent took a career break, then go to the question 46

If the respondent didn't take a career break, then skip to Section 5

46. What was the total duration of your longest career break after completing your doctorate?

- Less than 3 months
- Between 3 and less than 6 months
- Between 6 and less than 12 months
- 12 months or more

47. What was your main reason for taking a career break? If you had more than one break after completing your doctorate, please refer to your longest one.

- Maternity/paternity leave and childcare commitments
- Other family reasons (e.g. related to partner or elderly parents)
- Sickness (personal health problems)
- Travelling
- Unemployment
- COVID-19 pandemic



- Other (please specify)

SECTION 5: INTERSECTORAL MOBILITY

48. Are you considering changing the sector of your current employment?

- Yes, I work in the academic sector (e.g. university or research organisation), and I want to move to the non-academic sector
- Yes, I work in the non-academic sector, and I want to move to the academic sector
- Yes, I work in the non-academic sector, and I want to move to another non-academic sector (e.g. business, governmental/not-for-profit, healthcare sector)
- Yes, I want to mix the work in the academic and non-academic sectors at the same time
- No, I am not considering changing the sector of my current employment

49. How many other employers did you have before your current employment and after obtaining your doctorate (including postdoctoral positions with other employers)?

- 0 (Did not have other employers after doctorate)
- 1
- 2
- 3
- 4 or more

If the respondent did not have any other employers after the completion of the doctorate (Answer "0"), then skip to question 54.

50. Before your current employment and after obtaining your doctorate, were you engaged in research?

- Yes
- No

51. Before your current employment and after obtaining your doctorate, did you work in (a) different sector(s) from that of your current employment?

- Yes
- No

If the respondent worked in different sectors, then go to question 52.

If the respondent did not work in different sectors, then go to question 54.

52. Before your current employment and after obtaining your doctorate, in which sector(s) have you worked? Please select all that apply.



- Academic sector (e.g. university, research performing organisation)
- Business sector: industry
- Business sector: services and other
- Government or another public sector
- Healthcare sector (e.g. hospital, clinical centre)
- Non-higher education (e.g. secondary school)
- Private not-for-profit sector
- Other (please specify)

53. Which were the reasons to change sectors? Select all that apply.

- To gain new skills and experience
- It was the only way to enter the labour market
- Personal reasons
- Other (please specify)

54. After obtaining your doctorate, have you ever had more than one employer (including your current employment), e.g. several part-time jobs?

- Yes
- No

If the respondent has been employed in only one organisation, then skip to Section 6

55. In which organisations have you ever combined positions at the same time? Please select all that apply.

- Positions in more than one organisation from academic sector
- Positions in organisations from both academic and business sector
- Positions in organisations from both academic and governmental/not-for-profit sector
- Positions in organisations from both academic and health care sector (hospital, clinical center)
- Positions in more than one organisation from non-academic sector

56. Which were the reasons to combine positions in different sectors at the same time?

Select all that apply.

- To gain new skills and experience
- No full-time job available
- Personal reasons
- Other (please specify)

SECTION 6: GEOGRAPHICAL MOBILITY



57. Have you lived and worked outside your country of citizenship, after completing your doctorate?

- Yes
- No

If the respondent lived or worked abroad, then go to the question 58

If the respondent didn't live or work abroad, then skip to Section 7

58. After completing your doctorate, what was the duration of your longest stay outside your country of citizenship?

- Less than 3 months
- Between 3 and less than 6 months
- Between 6 and less than 12 months
- 12 months or more

If the respondent was abroad less than 3 months, then skip to Section 7

59. What were the reason(s) for living abroad for three months or more after completing your doctorate? Please select all that apply.

- End of postdoctoral position or job contract
- Previous job/study experience in the destination country
- Returning to my home country
- Economic/financial opportunities
- Career development opportunities
- Partner's career development opportunities
- Culture and language
- Other reasons (please specify)

SECTION 7: DEMOGRAPHICAL DETAILS

60. In which country do you currently live?

Dropdown menu for Country Selection

61. Please select your country(ies) of citizenship (s)

First Citizenship Country (drop-down menu for country selection)

Second Citizenship Country (drop-down menu for country selection)

Third Citizenship Country (drop-down menu for country selection)



62. What is your year of birth?

Dropdown menu 1940-2000

63. What is your gender?

- Male
- Female
- Other
- Prefer not to respond

64. How many children do you have? Please enter a number in each section. If you have no children, please enter '0' (zero).

- 0
- 1
- 2
- 3
- 4 or more

SECTION 8: QUESTIONNAIRE EVALUATION AND FOLLOW UP

65. Please rate the questionnaire you have just completed under the following categories:

(1 = Very poor; 2 = Poor; 3 = Fair; 4 = Good; 5 = Very good)

- Clarity of questions
- Relevance of questions to your career experience
- Questionnaire length
- Effort needed to complete the questionnaire

66. Would you agree to be contacted by your university or European Science Foundation in the future to complete a similar questionnaire?

- Yes, I agree to be contacted again
- No, I do not wish to be contacted again

If the respondent agrees to be contacted again, then go to the question 67

If the respondent does not agree, then skip to question 68.



67. Please enter a steady email address that can be used to contact you. You are also welcome to provide an additional, possibly private email address.

- Email address (where it is easiest to contact you):
- Possibly further email address:

68. If you like, please let us know your comments and suggestions to improve this questionnaire.

.....

8.2. ANNEX 2: INFORMED CONSENT FORM

This informed consent form is for PhD graduates of European universities, who are invited to participate in the DocEnhance PhD graduates' career-tracking survey carried out by the European Science Foundation.

Name of Principle Investigator: Julia Boman
Name of Organisation: European Science Foundation
Project: DocEnhance GA872483 H2020-SwafS-2019-1

This Informed Consent Form has two parts:

- Information Sheet (to share with your information about the study)
- Certificate of Consent (for signatures if you choose to participate)

You will be able to download and keep a copy of the full Informed Consent Form

Part I: Information Sheet

Introduction

[European Science Foundation-Science Connect](#) (ESF) is involved in the European Union-founded project [DocEnhance](#) and as part of this project, we would like to give you information and invite you to be part of the research we are going to carry out on careers of doctorate holders. If you are not sure whether you would like to participate in the research or not or if there are words that you do not understand, you can talk to anyone you feel comfortable with about the research or contact us directly (see Section Contact), and then decide.

This consent form may contain words that you do not understand.

Purpose of the research

We want to study occupational patterns of doctorate graduates and understand if they have pursued research careers in academia or industry thanks to transferable skills acquired, or



whether they have moved on to other occupations. We would like to explore whether doctoral training has enabled them to progress towards their desired career goals and how satisfied they are with their jobs. This questionnaire will offer valuable feedback to the participating universities on how to improve their doctoral training.

Type of Research Intervention

This research will involve filling out an online questionnaire.

Participant Selection

You are being invited to fill out this questionnaire because you have pursued and completed a doctoral degree at one of the DocEnhance partner universities in the relevant time period (2016-2020).

Voluntary Participation

Your participation in this research is voluntary. It is your choice whether to participate or not. You may change your mind later and stop participating, even if you have agreed to do so previously.

Procedures

- A. This research study consists of an online questionnaire. If you choose to participate, you will help us to learn more about the career paths of doctorate holders. In this way, you will contribute to improve and enhance doctoral training in Europe and beyond.
- B. You are invited to fill out the questionnaire sent by your university. The questionnaire is to be filled out online. If you do not wish to answer any of the questions included in the survey, you may skip them and move on to the next question. The types of questions will concern, for instance, your doctorate completion time, competences gained, transition to the first position, employment status and sector of employment, relationship between work and doctorate, engagement or not in research, as well as motivation for and satisfaction with the current job.

Duration

The DocEnhance career tracking survey task takes place over 24 months and involves several stages: preparation of the questionnaire, design and set-up of the survey, survey launch, analysis of collected data and preparation of the report(s) outlining the main results. The survey will be open for a period of approximately four weeks (launching in March 2021).

Risks

The questionnaire is not asking for any sensitive information (e.g. political opinions or community beliefs) and the confidentiality arrangements in place will guarantee that any potentially identifying data collected (e.g. year of birth, gender or citizenship) will be used for the purposes of statistical analysis only and anonymized before analysis. There is a risk that in



open-ended questions you may share some personal or confidential information by chance or that you may feel uncomfortable answering some of the questions. You do not have to answer any question if you feel the question is too personal or if answering it makes you uncomfortable. The answers will be anonymised. Any potentially identifying personal data collected by the survey such as the year of birth, gender, or citizenship are only used for statistical analysis of aggregate trends. The data collected will be used for research and evaluation purposes. It will be made available to institutions and other researchers anonymously only. At the end of the questionnaire, you will be asked if you would agree to be contacted again for any follow up survey in several years' time. In case you agree, you will be asked to provide a contact email. Your contact data will always be processed and stored separately from the survey data.

Benefits

There will be no direct benefit to you, but your participation is likely to help us find out more about how to adjust doctoral training programme so that it leads to fulfill careers for the doctorate holders. You may also be interested in finding out which career paths the graduates from your university have followed.

Reimbursements

This is an online survey without direct costs to you. You will therefore not receive any monetary reimbursement for your participation.

Confidentiality

The questionnaire does not seek any personally identifiable information except for your year of birth, gender and citizenship, which are only used for the purposes of the statistical analysis of aggregated trends. At the end of the questionnaire, you will be asked if you would agree to be contacted again for any follow up survey in several years' time. In case you agree, you will be asked to provide a contact email. Your contact data will always be processed and stored separately from the survey data. You can revoke your acceptance of the storage of your contact data in written form at any time (via email at database@esf.org) without giving reasons. It will then be immediately deleted.

Sharing the Results

The knowledge that we gain from this research will be shared and made widely available to the public via the [DocEnhance](#) project website and [European Science Foundation-Science Connect](#) website.

Right to Refuse or Withdraw

You do not have to take part in this research if you do not wish to do so, and you may stop participating in the survey at any time.

Contact

If you have any questions about this survey, please contact Julia Boman at jboman@esf.org.



If you have any ethical or data questions regarding General Data Protection Regulation (GDPR), you can contact the ESF designated Data Protection Officer, Isabelle Vonesch, contact at database@esf.org. The Data Protection Officer will ensure that personal data collection and processing in the frame of this survey will be carried out according to EU and national legislation.

Part II: Certificate of Consent

I have been invited to participate in a career-tracking survey designed for doctoral graduates from European universities. I am willing to participate in this study in order to enable a better understanding of doctoral graduates' career paths and their transferable skills. I have read the foregoing information.

I have read the foregoing information. I have had the opportunity to ask questions about it and any questions I have been asked, have been answered to my satisfaction. I consent voluntarily to be a participant in this study. I reserve the right to withdraw from the study at any point, without giving any reason or explanation.

- Print name of participant, Date and Signature – via online system