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theoria poiesis praxis

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# **CIDTFF RESEARCHER DEVELOPMENT PLAN 2023-2026**

[CIDTFF\_RDP\_2023-2026]



**CIDTFF RESEARCHER  
DEVELOPMENT PLAN 2023-2026**  
[CIDTFF\_RDP\_2023-2026]

**Plano de Desenvolvimento de Investigadores  
do CIDTFF para 2023-2026**  
[CIDTFF\_PDI\_2023-2026]

**A guiding document that:**

- (a) encompasses the need to design an RDP for CIDTFF (section 2);
- (b) proposes a theoretical and practical framework for the development of research and researchers at CIDTFF (section 3);
- (c) presents guidelines for operationalising the plan with actions and processes to be implemented (section 4);
- (d) presents a proposal for monitoring the implementation of the CIDTFF\_RDP\_2023-2026 (section 5).

## Imprint Page

**Title:**

CIDTFF Researcher Development Plan for 2023-2026 [CIDTFF\_RDP\_2023-2026]

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**Design and layout:** Joana Pereira

**Publisher:**

UA Editora

Universidade de Aveiro

Serviços de Documentação, Informação Documental e Museologia

1<sup>a</sup> edition - february 2024

**DOI:** <https://doi.org/10.48528/hwkx-5588>



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Financially supported by National Funds through FCT – Fundação para a Ciência e a Tecnologia, I.P., under projects UIDB/00194/2020 (<https://doi.org/10.54499/UIDB/00194/2020>) and UIDP/00194/2020 (<https://doi.org/10.54499/UIDP/00194/2020>).



# ÍNDICE

<b>Glossary</b> .....	<b>3</b>
<b>1. Introduction</b> .....	<b>7</b>
1.1. The CIDTFF Researcher Development Group: members and mission .....	7
1.2. Beneficiaries of the CIDTFF Researcher Development Plan.....	8
1.3. Vision and objectives of the Researcher Development Plan .....	8
1.4. Structure of the CIDTFF Researcher Development Plan .....	9
<b>2. Framework</b> .....	<b>11</b>
2.1. Development plan for researchers - motivations and relevance.....	11
2.2. Definition of researcher development.....	12
2.3. The approach of the working group (WG).....	13
<b>3. Framework for the CIDTFF Researcher Development Plan (CIDTFF_RDP_2023-2026) ....</b>	<b>15</b>
3.1. Reference framework for the development of researchers by domain .....	15
3.1.1. The domains of researcher development.....	16
3.2. Development of the researcher's "Self" (individual and collective).....	22
3.2.1. Building the individual and collective researcher's "Selves" .....	23
3.2.2. Dynamics between individual and collective knowledge and between tacit and explicit knowledge.....	24
3.2.3. Implications of the dynamics between individual and collective knowledge and between tacit and explicit knowledge for a researcher development plan .....	26
3.2.4. Building the researcher's identity: recognising subjectivity as the starting point for setting the epistemic actor in motion .....	27
<b>4. RESEARCHER DEVELOPMENT PLAN FOR CIDTFF [CIDTFF_RDP_2023-2026].....</b>	<b>29</b>
4.1. Key process for building the researcher's "Self" (individual and collective).....	29
4.2. A self-assessment tool for the individual researcher's "Self" .....	30
4.3. A self-assessment tool for the collective researcher's "Self" .....	32
4.4. Structured training programme for 2023-2026 .....	34
4.4.1. Group responsible for receiving proposals for actions and for deciding which ones to be implemented .....	34
4.4.2. Actions for the Individual Researcher's "Self" by domain .....	34
4.4.3. Actions to build the collective researcher's "Self".....	35
4.4.4. Proposals for actions to build the collective researcher's "Self" .....	37
4.5. Framework for other proposals or initiatives in 2023-2026 .....	39
4.5.1. Structure and content of the form for proposing actions under the RDP.....	39
<b>5. MONITORING THE CONSTRUCTION OF THE INDIVIDUAL AND COLLECTIVE RESEARCHER'S SELF .....</b>	<b>41</b>
5.1. Monitoring the construction of the individual researcher's "Self" .....	42
5.2. Monitoring the construction of the collective researcher's "Self" .....	43

<b>Annexes .....</b>	<b>45</b>
Annex 1 - Text based on the literature for Section 3.2 [Development of the Researcher’s “Self” (individual and collective)] .....	47
Annex 2 - Questionnaire to assess the interests and needs of CIDTFF researchers for their RDP .....	55
<b>References .....</b>	<b>57</b>

## GLOSSARY

**The collective researcher's "Self":** is defined as the competence of an organisation/group, as a whole, to mobilise collective beliefs, attitudes, motivations, values and knowledge to create, for instance, a research focus and generate new knowledge, disseminate it throughout the organisation and incorporate it into its products, services and systems (Mugur-Schächter, 2006; Nonaka & Takeuchi, 1995, 2007).

**Coping:** a term from Psychology that refers to the cognitive and behavioural strategies and resources that the researcher uses to deal with *stress* and difficult situations. These strategies can involve problem-solving, seeking social support, reinterpreting the situation more positively or dealing with the resulting negative emotions (Lazarus & Folkman, 1984).

**Creation of collective knowledge (organisational):** the competence of an organisation/group, as a whole, to create new knowledge, disseminate it throughout the organisation and incorporate it into its products, services and systems (Nonaka & Takeuchi, 1995, 2007).

**Development domains:** these cover the knowledge, intellectual and technical skills, and professional standards for carrying out research, as well as the qualities, knowledge and skills for working with others and ensuring the broadest impact of research.

**Epistemic actor:** an individual or collective subject who takes on agency in the construction of knowledge, i.e. assumes the status of an active agent in the process of producing and disseminating knowledge (Mugur-Schächter, 2006, Lopes et al. 2023).

**Evaluation:** is a systematic process of measurement and analysis with the aim of making decisions based on the evidence collected and analysed and generating improvements. Evaluation always presupposes an investigative act of collecting information, based on a framework in which this information makes sense (Nevo, 1983; Fernandes, 2013).

**Explicit knowledge:** the type of knowledge that can be articulated, documented, codified and easily shared with others. This knowledge usually involves facts, data, concepts, rules or instructions that are consciously acquired and easily expressed or explained. It is through the internalisation of more explicit knowledge, incorporating it into action and practice or through experimentation or simulation, that it is possible to increase the repertoire of individual tacit knowledge (Nonaka & Takeuchi, 1995, 2007).

**Identity (of the researcher):** how researchers see themselves in relation to their work, which can be influenced by a variety of factors, including their area of specialisation, academic background, culture, as well as their personal context. The researcher's identity is flexible and can evolve over time as he or she accumulates experience, knowledge, and new perspectives, particularly through socialisation with peers (Castelló et al., 2021).

**The individual researcher’s “Self”:** the competence of an individual, possibly as part of a research team, to mobilise beliefs, attitudes, motivations, values, and knowledge to create, for instance, a focus of study and contribute to creating new knowledge, disseminating it throughout the organisation and incorporating it into its products, services and systems (Mugur-Schächter, 2006).

**Internalisation:** refers to the process by which researchers assimilate and integrate, consciously or unconsciously, knowledge, attitudes, values, behaviour patterns and beliefs from society or their immediate environment into their own belief systems (Nonaka & Takeuchi, 1995, 2007).

**Interpersonal development:** involves improving and/or deepening the researcher’s skills to work as part of a team and in a collaborative manner. It also refers to the competences that allow researchers to manage their professional development and look after their physical and psychological well-being.

**Monitoring:** is a systematic and continuous process through which the progress of a project, a study or any other activity is observed over time, in the light of the objectives set.

**Reflexivity:** is the practice of recognising, debating, and justifying the researcher’s ontological, epistemological, and methodological conceptions (explicit subjectivity), and is therefore an instrument at the service of the construction of the epistemic “Self”.

**Researcher development:** a multidimensional concept that encompasses the intellectual, attitudinal and behavioural development of the researcher, both personally and professionally, and on an individual and collective level. It is a process aimed at improving the researcher’s competences (Evans, 2011, 2015). In this document, it refers to the construction of the individual researcher’s “Self” (generalised meaning in the literature), but it also refers to the construction of the collective researcher’s “Self”, since both are interconnected, as explained in the document in section 3.2 (Lopes et al., 2023).

**Researcher Development Framework (RDF):** a tool developed in the UK to plan, promote and support the personal and professional development and career progression of researchers from all disciplines and at any stage of their careers.

**Research impact:** the longer-term influence or contribution of the body of research to human knowledge. This contribution can be exerted in various dimensions, namely: in the academic dimension, when the research distinguishes itself by applying new methods or advancing knowledge; in the social dimension, when the results have an influence on society (people and their practices, organisations, systems) and the environment; and in the political realm, when the studies make it possible to formulate policies or provide information to political decision-makers.

**Researcher self-care:** refers to activities that the researcher carries out to look after his or her own physical and mental health. Developing self-care habits makes it possible to manage situations of stress and frustration and promote general well-being (Jones & Whittle, 2021).

**Researcher self-efficacy:** refers to the researcher’s beliefs about his or her abilities and competences to carry out tasks and achieve goals. Self-efficacy influences the way researchers think, feel, motivate themselves and behave, and can influence their motivation and performance.

**Researcher self-evaluation:** a process through which the researcher evaluates his or her own work, performance or characteristics. Self-evaluation allows researchers to reflect on their strengths, weaknesses and areas for improvement.

**Researcher self-management:** refers to the researcher’s ability to take initiative and control over their actions, behaviour and goals. This includes the ability to set goals, make plans, organise tasks, regulate one’s own behaviour, monitor progress and evaluate performance.



**Researcher self-regulation:** refers to the researcher's ability to monitor, evaluate and (re)adjust his or her own thoughts and behaviours in order to achieve a set goal. It involves the ability to actively self-manage their behavioural, cognitive and metacognitive processes (including emotions, impulses and thoughts) in order to define and implement actions to achieve goals (for example, acquiring or improving new knowledge and skills) (Pedrosa, 2017).

**Small research groups at CIDTFF:** groups of CIDTFF researchers, usually including fewer than 10 members and with different profiles, who usually gather informally around a theme or purpose, proposing and/or stimulating actions aimed at contributing to the development of the other CIDTFF members.

**Socialisation in research processes:** this is an active process of learning and change through which the researcher acquires the knowledge, language, social norms, values, and habits needed to participate in and integrate a group or community of researchers (Gardner, 2008). It is through socialising with other researchers in a given environment that the conditions are created for building tacit, multiple and varied knowledge.

**Subjectivity:** refers to the way the researcher sees the world based on his or her personal and individual experiences. Subjectivity as inherent to the researcher and to the research process is an essential step in the construction of the epistemic "Self".

**Sustainability (of the research):** refers to the characteristic of a piece of research being effective in the long term. This encompasses the design, the conduct, and the results of the research along with its continuity after the end of the funding period. Sustainable research is financially viable, is based on a relevant theoretical framework, involves motivated participants with common interests, is capable of involving the community, leads to the production of useful knowledge and uses efficient and sustainable resources, minimises environmental impact, leads to replicable results, prompts new research questions, and ensures its continuity after the termination of the project that gave rise to it (Guerra & Costa, 2016).

**Tacit knowledge:** a type of subject knowledge that is non-explicit, subjective, contextual and practical in nature, linked to personal experience. It is the knowledge of knowing how to do and to be, encompassing techniques, methods, ways of thinking and speaking, approaches with actors in the field, or attitudes, which do not require explicit discourse. Tacit knowledge is the primary source of the individual researcher's "Self" (Nonaka & Takeuchi, 1995, 2007).

**Teleological:** considering the object to be known by its behaviour (purposes) and not by the immediate causes that regulate it (a law); it is a question of moving from analysis to the design of a solution with an explicit purpose (Le Moigne, 1994).



# 1. INTRODUCTION

## 1.1. The CIDTFF *Researcher Development* Group: members and mission

The CIDTFF *Researcher Development* Group was formally constituted by the CIDTFF coordinators using Order No. 3 - CIDTFF/2023 of 11 April 2023. The group consists of five members with diverse profiles and representative of the three CIDTFF research groups, namely:

- Daniela Cristina Carneiro Pedrosa;
- Diana Rita Carvalho Soares;
- Joaquim Bernardino de Oliveira Lopes;
- Mónica Sofia Marques Lourenço;
- Patrícia Alexandra Pacheco de Sá.
- 

The group has been assigned the following mission and responsibilities:

1. To develop, discuss and present a final version of a training and professional development plan (*researcher development*) for the members of the CIDTFF team, to be implemented between 2023 and 2026, with actions of a structured and continuous nature, and considering aspects of CIDTFF's identity and its multidisciplinary matrix, articulated with the centre's scientific coordination.
2. Accompany and monitor the implementation of the plan and the planned actions, as well as evaluating their results and effects on the development of the **individual** and **collective researcher's "Self"**.

It is noteworthy that the implementation of *the* plan is the **responsibility of all CIDTFF researchers**, i.e. each of the centre's members (coordination, integrated members and collaborating members), individually or as a group, oversees the implementation of this plan. Implementing the plan means: 1) attending and actively participating in the proposed actions or processes; 2) taking the initiative to propose, organise, implement, and disseminate actions / initiatives / processes for the development of researchers.

**Individual researcher's "Self":** the competence of an individual, as part of a research team, to mobilise beliefs, attitudes, motivations, values, and knowledge to create, for example, a focus of study and contribute to creating new knowledge, disseminating it throughout the organisation and incorporating it into its products, services, and systems (Mugur-Schächter, 2006).

**Collective researcher's "Self":** defined as the ability of an organisation/group, as a whole, to mobilise **collective** beliefs, attitudes, motivations, values and knowledge in order to create, for example, a research focus and generate new knowledge, disseminate it throughout the organisation and incorporate it into its products, services and systems (Mugur-Schächter, 2006; Nonaka & Takeuchi, 1995, 2007).

## 1.2. Beneficiaries of the CIDTFF Researcher Development Plan

The Researcher Development Plan (RDP), to be implemented between 2023-2026, is aimed at:

- All the CIDTFF researchers, from researchers in initial training (e.g. PIC-EDU students) to researchers in advanced training (e.g. PhD students enrolled in CIDTFF doctoral programmes), integrated members and collaborating members.
- Coordinators of laboratories, research groups, programmatic projects and coordination of CIDTFF.
- Technicians and scholarship holders from the CIDTFF secretariat.
- In very exceptional situations, external audiences, depending on the type of activities (particularly training seminars).

## 1.3. Vision and objectives of the Researcher Development Plan

### Our vision for the *CIDTFF\_RDP\_2023-2026*

The **vision we propose for the *CIDTFF\_RDP\_2023-2026*** is that of building the personal researcher's "Self" in which each researcher must affirm their uniqueness, **subjectivity** and autonomy that manifest in one's personal path, a necessary condition for building the CIDTFF's **collective researcher's "Self"**. This plan should be seen as a flexible proposal, allowing researchers the autonomy to choose/attend/propose actions of their interest or need, favouring the diversity of researcher profiles and for CIDTFF to create the processes needed to build each researcher's individual and collective identities.

**Thus, the main objectives of the present *CIDTFF\_RDP\_2023-2026* are:**

- 1 Promoting the personal, professional and interpersonal development of each CIDTFF researcher in their autonomous and unique dimension;
- 2 Building each researcher's "Self" as well as the CIDTFF's collective researcher's "Self".
- 3 Promoting the collective development of CIDTFF as a learning organisation and what it is as a research centre, what it wants to investigate, how and for whom it works.

**Subjectivity:** refers to how the researcher sees the world based on his or her personal and individual experiences. Subjectivity as inherent to the researcher and to the research process is an essential step in the construction of the epistemic "Self".

**Collective researcher's "Self":** this is defined as the ability of an organisation/group, as a whole, to mobilise collective beliefs, attitudes, motivations, values and knowledge in order to create, for example, a research focus and generate new knowledge, disseminate it throughout the organisation and incorporate it into its products, services and systems (Mugur-Schächter, 2006; Nonaka & Takeuchi, 1995, 2007).

Hence, the *CIDTFF\_RDP\_2023-2026* is a guiding document that: (a) frames the need to build an RDP for CIDTFF (section 2); (b) proposes a theoretical and practical framework for the development of research and researchers at CIDTFF (section 3); (c) presents guidelines for the operationalisation of the plan with actions and processes to be implemented (section 4); (d) presents a proposal for monitoring the implementation of the *CIDTFF\_RDP\_2023-2026* (section 5).

The *CIDTFF\_RDP\_2023-2026* also integrates a set of self-reflection tools that allow each researcher to build his or her own career path.

## 1.4. Structure of the CIDTFF Researcher Development Plan

The structure of the CIDTFF\_RDP\_2023-2026 consists of four parts, namely:

Section 2. Framing the need for an RDP

2.1. The rationale for a development plan for researchers - European legislation

2.2. Definition of *researcher development*

2.3. What did the group do? - documentary research

Section 3. Framework for the "CIDTFF\_RDP\_2023-2026"

3.1. Reference framework for the development of researchers by domain

3.2. Development of the researcher's "Self" (individual and collective)

Section 4. RD Plan for CIDTFF\_RDP\_2023-2026

4.1. Key process for building the researcher's "Self" (individual and collective)

4.2. A self-assessment tool for the individual researcher's "Self"

4.3. A self-assessment tool for the collective researcher's "Self"

4.4. Structuring training programmes for 2023-2026

4.5. Framework for other proposals or initiatives in 2023-2026

Section 5: Monitoring the construction of the researcher's "Self" (individual and collective)



## 2. FRAMEWORK

This section refers to the need for a Researcher Development Plan (section 2.1), defines Research Development (RD) (section 2.2) and summarises the group's approach to this work (section 2.3).

### 2.1. Development plan for researchers - motivations and relevance

The guidelines of the European policy related to the development of researchers are mainly set out in the *European Framework for Research and Innovation* (Horizon Europe) (European Commission, 2021), the *European Charter for Researchers* and the *Code of Conduct for the Recruitment of Researchers* (European Commission, 2008).

Horizon Europe is the European Union's research and innovation funding programme for the term 2021-2027. It sets out guidelines for the development and improvement of researchers' careers, encouraging training, mobility, and support for skills development.

The *European Charter for Researchers* and the *Code of Conduct for the Recruitment of Researchers* establish principles and guidelines for the recruitment and development of researchers in research institutions and universities, to guarantee an attractive and favourable working environment, and promote equal opportunities, transparency and ethics in recruitment and career development practices.

These guidelines aim to stimulate excellence in research, promote the mobility of researchers and create a favourable environment for innovation and scientific advancement in Europe.

Huisman and Van der Wende (2004) state that, nowadays, universities are increasingly challenged to train professionals who can effectively contribute to the development of a knowledge-based society. In this sense, the authors argue that the development of researchers is crucial to train academic professionals capable of dealing with the demands of an ever-changing society, especially about economic policies, and competition. Therefore, and in this alignment, a professional development plan for researchers is important for a university/research centre because it strengthens research, promotes academic excellence, increases competitiveness, stimulates collaboration, generates impact on society and values the well-being of researchers, converging directly with the strategic plan of the University of Aveiro (and other higher education institutions to which several members of CIDTFF belong), which argues that its entire structure and organisa-

tion must be geared towards supporting and promoting high-quality research, by valuing the best practices and skills of the members of the Academy (Rectory of the University of Aveiro, 2023).

The recent *European Framework for Researcher Competences: ResearchComp*, defined by the European Commission (European Union, 2023) refers to 7 areas of researcher competences, namely: 1) Cognitive Abilities; 2) Doing Research; 3) Managing Research; 4) Managing Research Tools; 5) Making an Impact; 6) Working with Others and 7) Self-Management. Specific competences for researchers are defined in each of the 7 areas, totalling 38 competences. For each of these competences, a descriptor is defined which is developed with a learning outcome. A total of 389 learning outcomes were stipulated at 4 levels of proficiency (foundational, intermediate, advanced, and *expert*).

*ResearchComp* makes it clear that a researcher does not need to be an expert in all the competences, but they do need to have competences in all 7 competence areas. The evolution/progression across levels of proficiency in the various competences is the result of dedicated training opportunities, on-the-job training, peer-to-peer learning, mentoring and coaching strategies.

Thus, a researcher development plan is important for several reasons, including skills development (*Vitae Researcher Development Framework*, ESRC, 2011), as it allows researchers to identify the skills they need to acquire or improve throughout their careers. On the other hand, it contributes to career progression, as it helps researchers set clear goals and short and long-term objectives, as well as identify progression opportunities, such as obtaining funding for research projects or leading teams. A development plan can also help researchers identify mobility opportunities, such as exchange programmes or collaborations with researchers from other countries (as is the case with the ERASMUS mobility programme). This broadens the professional network, promotes the exchange of knowledge and experiences, and contributes to the advancement of science. Finally, a development plan can contribute to researchers' satisfaction and well-being by providing a sense of meaning and purpose, allowing them to see a clear path for progress and achieve a greater sense of fulfilment in their work.

All in all, in general terms, a researcher development plan is essential for guiding researchers' careers, developing relevant abilities, achieving professional goals, promoting mobility and collaboration, and contributing to their general well-being as research professionals.

**Researcher self-management:**

this concept refers to the researcher's ability to take initiative and control over his or her actions, behaviour and tasks. This includes the ability to set goals, make plans, organise tasks, regulate one's own behaviour, monitor progress and evaluate performance.

**Researcher development:**

this is a multi-dimensional concept that encompasses the intellectual, attitudinal, and behavioural development of the researcher, both personally and professionally, and on an individual and collective level. It is a process aimed at improving the researcher's competences (Evans, 2011, 2015). In this document, it refers to the construction of the individual researcher's "Self" (a generalised term in the literature), but it also refers to the construction of the collective researcher's "Self", since both are interconnected, as explained in the document in section 3.2 (Lopes et al., 2023).

## 2.2. Definition of researcher development

Achieving an explicit and consensual definition of researcher development is a complex task. It is equally difficult to translate the concept into Portuguese. In the portuguese version of this document, we have opted for the translation "desenvolvimento do/a investigador/a", considering that this includes its professional, personal, and collective dimensions.

One of the first approaches to the concept was presented by Evans (2011), who defined researcher development as "the process whereby people's capacity and willingness to carry out the research components of their work or studies may be considered to be enhanced, with a degree of permanence that exceeds transi-



toriness” (p. 82). According to the author, researcher development encompasses both professional and personal dimensions, stating that “development that occurs in a professional or work context, and that enhances one’s capacity to undertake one’s work, must inevitably impinge upon or influence the attitudes, viewpoints, knowledge, understanding, and skills that may be applied to one’s life as a whole, and vice versa” (ibid, p. 83).

To illustrate the concept, Evans (2011) developed a model enclosing three components: a cognitive (or intellectual) dimension, a behavioural dimension and an attitudinal dimension. The cognitive dimension refers to the process “whereby people’s knowledge, understanding or reflective or comprehensive capacity or competence are modified” (p. 83) and comprises sub-components such as epistemological change, rationalist change, comprehensive change, and analytical change. The behavioural dimension refers to the process “whereby people’s behaviour or performance are modified” (ibid.) and integrates the following sub-components: processual change, procedural change, productive change and change at the level of skills and competences. For its part, the attitudinal dimension is the process “whereby people’s attitudes are modified” (ibid), encompassing perceptual change, evaluative change, and motivational change.

Although our understanding of researcher development follows some of the lines proposed by Evans, namely attention to the multidimensionality of the concept, we believe that it is not restricted to the individual dimension (both personal and professional) of the researcher, but also encompasses the collective dimension in its relationship and (re)construction with others. This dimension will be discussed in point 3.2 of this document.

### **2.3. The approach of the working group (WG)**

Aligned with the mission entrusted to it by the coordination of CIDTFF, the team first carried out an exploratory search on the Google search engine to identify existing professional development plans for researchers at the national and international level, selecting the following search terms in Portuguese and English: researcher development and “desenvolvimento de investigadores”. In Portuguese, the search generated several results, although it was possible to identify only two pieces of evidence of researcher development plans or courses proposed by Portuguese higher education institutions. These are the plan of the Instituto Superior Técnico (IST) of the University of Lisbon, entitled “Shaping the Future: Programa de Desenvolvimento de Carreiras para Professores e Investigadores do IST” and the “Research Skills Development Course” of the Universidade Nova de Lisboa, aimed at early career PhD researchers.

The “Shaping the Future” Programme (<https://shapingthefuture.tecnico.ulisboa.pt/>) was developed in the realm of a collaboration between the Scientific Council and the Pedagogical Council, with the support of the School Board and the IST Management Board, and is annually managed by the Academic Development Centre. The programme covers the scientific and pedagogical components and is aimed at new IST Professors and Researchers, to facilitate their integration into the academic experience of IST and their respective

Department, transmitting the School's ethical values and good institutional practices, as well as promoting the acceleration of their career in the dimensions of scientific and academic leadership and the development of skills in the scientific and pedagogical areas (training and observation of classes). It also promotes the scientific independence of new professors and researchers, as well as the development of an academic career with international impact. By way of example, it covers fundamental training, carried out in a three-day immersion programme outside the IST to strengthen the leadership dimension of research teams and projects, and training in the field of research and a complementary training programme covering teaching, science, and soft skills, based on the **evaluation** of the needs of faculty members and researchers.

The Research Skills Development Course (RSD), at Universidade Nova de Lisboa, is a four-day residential immersion course that has been developed to cover the key skills needed by early-stage PhD researchers. The course offers the opportunity for researchers to work in interdisciplinary teams, examine their impact on group dynamics, receive peer feedback on their performance and meet researchers from various departments and campi. Among the activities available are communication (individual and group presentation skills); teamwork (group roles, team dynamics, impact upon others); creativity (techniques and application); managing and understanding the PhD process (planning, problem-solving); and interdisciplinary collaboration (science communication, negotiation, decision-making). The focus is on experiential learning fueled by a series of challenging group exercises.

The existence of such plans and courses, along with others of which we were only informally aware (such as the professional development and induction plan for the Institute of Education at the University of Lisbon), underscores the centrality that researcher professional development issues have been taking on for institutions, and are seen as differentiating elements for them.

This centrality is in line with similar concerns felt in an international context if we take into account the English-language search that generated more than 600 million entries. In this case, it was possible to identify the existence of structured and grounded training programmes in British universities, aligned with the Researcher Development Framework (RDF) which served as the basis for the design of the RDP and which we present<sup>1</sup> in section 3.1.

**Evaluation:** is a systematic process of measuring and analysing to make decisions based on evidence collected and analysed and generating improvements. Evaluation always entails an investigative act of collecting information, based on a framework in which information makes sense (Nevo, 1983; Fernandes, 2013).

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<sup>1</sup> See in this regard what the European Union states (<https://op.europa.eu/en/publication-detail/-/publication/8d536780-3025-11ed-975d-01aa75ed71a1/language-en>) in which attention is drawn to the need for better alignment between competences and the different career stages. In addition, it is noted that most of these frameworks are based on RDF due to a successful experience in terms of applicability and content. Outside the European Union, there is also the University of Canberra's RDSF, which is similar to the RDF, and finally, the analysis revealed that the various frameworks identified need to be articulated with policies and monitoring.

### 3. FRAMEWORK FOR THE CIDTFF RESEARCHER DEVELOPMENT PLAN(CIDTFF\_RDP\_2023-2026)

This section proposes a theoretical and practical framework for the development of researchers, and thus research at CIDTFF.

The reference framework developed in section 3.1 relies on four domains as established on the *Vitae Researcher Development Framework* (ESRC, 2011), and adopted in the United Kingdom. It is a reference framework that values the individual dimension of the researcher. However, it is a framework that has been systematically used and on which there is published research (Bray & Boon, 2011). Hence, it holds great value, and as such, we have chosen to adopt it.

Nevertheless, we perceived that there was a lack of an epistemological dimension to the construction of the researcher's "Self", and it was in this search and on this basis that we drew up a proposal for a reference framework dedicated to the construction of the researcher's individual and collective "Self", which is described in section 3.2. In this endeavour, we note that **tacit knowledge**, **subjectivity** and **self-regulation** are absolutely crucial in the construction of the individual researcher's "Self". Besides, the individual researcher's "Self" cannot be built independently of the organisation in which it is inserted. In fact, it becomes necessary to build the collective "Self" of that organisation. This intellectual journey has allowed us to identify aspects of the "CIDTFF\_RDP\_2023-2026" that we feel are extremely important and from which we can highlight some of CIDTFF's internal work processes that can enable the construction of the researcher's "Self" (individual and collective).

#### 3.1. Reference framework for the development of researchers by domain

The **Researcher Development Framework (RDF)** adopted in the UK (*Vitae Researcher Development Framework*, ESRC, 2011) is a tool developed to plan, promote, and support the personal and professional development and career progression of researchers from all disciplines and at any stage of their careers. The RDF was developed by the *Economic and Social Research Council* (ESRC) of the United Kingdom based on empirical data collected through interviews with researchers to identify the characteristics of "excellent researchers" expressed in the RDF as "descriptors". The descriptors are structured into four domains and twelve sub-domains, covering the knowledge,

**Tacit knowledge:** is a type of subject knowledge that is non-explicit, subjective, contextual and of a practical nature, linked to personal experience. It is the knowledge of knowing how to do and be, encompassing techniques, methods, ways of thinking and speaking, approaches with actors in the field, or attitudes, which do not require explicit discourse. Tacit knowledge is the primary source of the individual researcher's "Self" (Nonaka & Takeuchi, 1995, 2007).

**Researcher self-regulation:** refers to researchers' ability to monitor, evaluate and (re)adjust their own thoughts and behaviours to achieve a set goal. It involves the ability to actively self-manage their behavioural, cognitive, and metacognitive processes (including emotions, impulses and thoughts) to define and implement actions to achieve their goals (for example, acquiring or improving new knowledge and skills) (Pedrosa, 2017).

**Researcher Development Framework (RDF):** is a tool developed in the UK to plan, promote and support the personal and professional development and career progression of researchers from all disciplines and at any stage of their careers.

intellectual abilities, techniques, and professional standards to do research, as well as the qualities, knowledge, and skills for working with others and ensuring the wider impact of research (Figure 1).

The four domains are as follows:

Domain A - *Knowledge and intellectual abilities*: involves the ability to engage with existing knowledge in a research area, as well as demonstrating a commitment to ethics, integrity and academic values.

Domain B - *Personal effectiveness*: includes the development of personal skills, such as the ability to manage time effectively, deal with stress, make decisions and set clear goals for professional development.

Domain C - *Research governance and organisation*: concerns knowledge of the professional standards and requirements needed to carry out research.

Domain D - *Engagement, influence and impact*: involves the knowledge and skills needed to work with others and ensure the impact of your research, such as communication skills, leadership, teamwork, entrepreneurship and project management.

Each of the sixty-three descriptors contains between three and five phases, representing different stages of development or levels of performance within that descriptor.

The RDF provides a framework for researchers to identify the areas in which they need to develop their competences and plan their professional development accordingly. It can also be used by research institutions to design training programmes tailored to researchers' needs.

The RDF served as inspiration for the definition of professional development domains for CIDTFF researchers.

### 3.1.1. The domains of researcher development

Based on the RDF's domains, a framework was built that was more in line with what the group felt were the domains to be developed by CIDTFF researchers (Figure 2). Each domain and subdomain is explained below:

#### *Domain A - Training in research and scientific supervision*

Domain A concerns the development and/or deepening of a set of theoretical and technical competences needed to carry out research in the social sciences and humanities and perform scientific supervision activities. This domain includes four subdomains: knowledge base, scientific literacy, research methods and techniques, and scientific supervision.

#### *A1 - Knowledge base*

A researcher's knowledge base refers to the set of fundamental knowledge and skills necessary for them to be able to carry out studies in their field and produce meaningful knowledge.

Examples of possible *actions/initiatives/workshops/talks*: Information research; Information management; Statistics; English language for academic purposes.

**Development domains:** cover the knowledge, intellectual and technical skills, and professional standards for carrying out research, as well as the qualities, knowledge, and skills for working with others and ensuring the broadest impact of research.



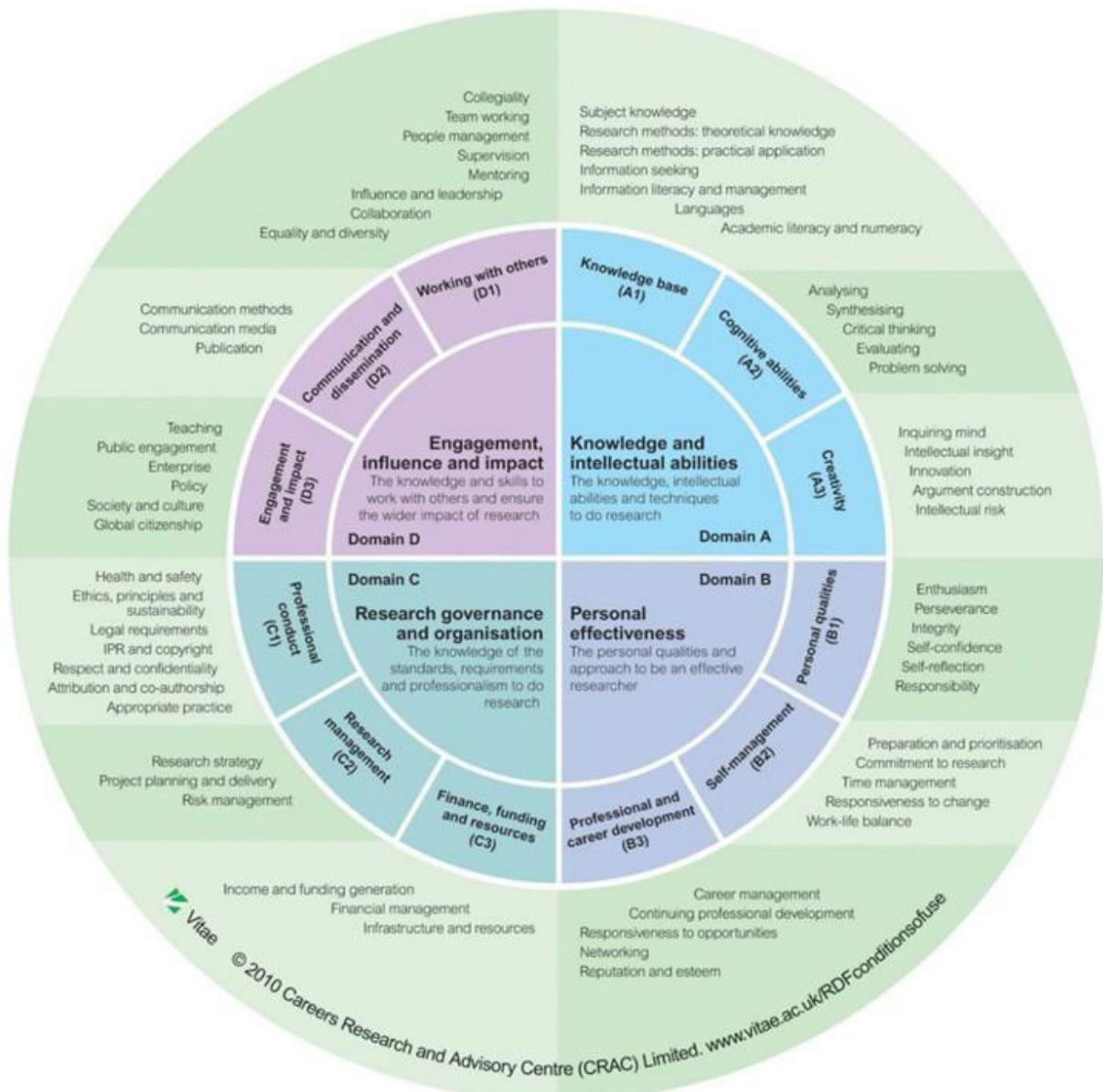


Figure 1 - Researcher Development Framework (ESRC, 2011, p.2)

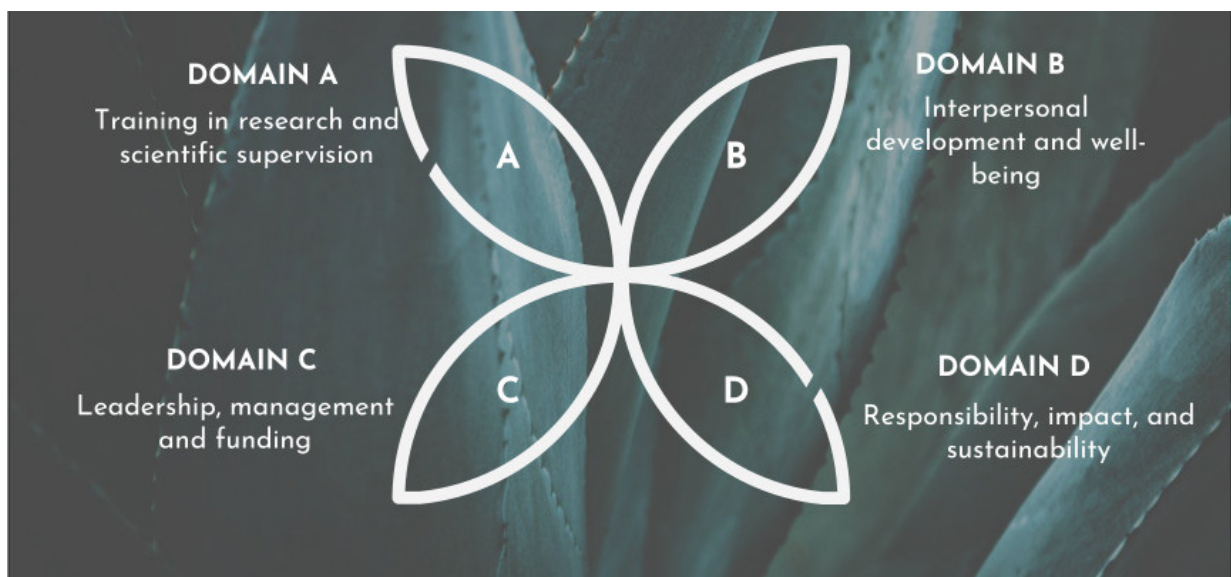


Figure 2 - Researcher development domains (authors' framework)

## *A2 - Scientific literacy*

Scientific literacy is the ability to understand and apply scientific knowledge to make informed decisions on issues related to science and society. It includes, for example, the ability to understand basic scientific concepts, understand scientific processes, evaluate scientific evidence, and use this information to make informed decisions. Scientific literacy can also be understood as a situated social practice of language use associated with the processes of acquiring, elaborating, and expressing scientific knowledge, which develops through the researcher's increasing involvement in authentic and meaningful learning processes. In this sense, it is reflected in the gradual appropriation of the shared cultural values and communicative repertoires of a given discipline on the part of the researcher.

Examples of possible *actions/initiatives/workshops/talks*: Theories and principles in social and human sciences (research); Concepts in (research on) social and human sciences; Philosophical and epistemological bases in (research on) social and human science; Academic writing; Academic referencing standards.

## *A3 - Research methods and techniques*

Research paradigms, methods and techniques in the social sciences and humanities refer to the well-founded procedures used by researchers in these areas to collect, analyse and interpret data in scientific research in a systematic, rigorous, and reliable way. They include theoretical knowledge about specific strategies and procedures for collecting and analysing data in the context of social sciences and humanities as well as their practical application.

Examples of possible *actions/initiatives/workshops/talks*: Paradigms and nature of research; Quantitative, qualitative and mixed methods; Methods and types of studies (case study, [participatory] action research, grounded theory,... ); Data collection techniques (questionnaire survey or interview, focus group, observation...); Data processing and analysis techniques (statistical analysis, content analysis, discourse analysis, thematic analysis...); Software to support data analysis (NVivo, SPSS, WebQDA); Accessing, storing, managing and sharing data in educational research; Innovative methodologies in the social sciences and humanities (social cartography, digital ethnography,...).

## *A4 - Scientific supervision*

Scientific supervision refers to the guidance and support provided by a more experienced and qualified researcher to a trainee researcher who is carrying out a research project or thesis. In scientific supervision, the supervisor provides guidance and critical and constructive feedback on the work developed throughout the research process, to ensure that the research is conducted by ethical principles and rigorous methodological standards, on the one hand, and to develop the skills necessary for the researcher to become independent and successful in his or her field of study, on the other. Scientific supervision is therefore essential to guarantee the quality and relevance of the research, as well as to promote the professional development of the trainee researcher.

Examples of possible *actions/initiatives/workshops/talks*: Roles and competences of the supervisor and the mentee; Rights and duties of the supervisor and the mentee; Supervisory style and relationship; Intercultural supervision; Feedback; Monitoring the mentee's progress; Promoting the mentee's autonomy.

## Domain B - *Interpersonal development and well-being*

Domain B refers to the development and/or deepening of the researcher's (inter)personal competences and personal qualities, which enable him or her to be effective, and work in a team and collaboratively. It also refers to the competences that enable researchers to manage their professional development and take care of their physical and psychological well-being. This domain includes four subdomains: self-regulation, well-being, interpersonal development, and collaborative work.

### *B1 - Self-regulation*

The self-regulation subdomain refers to the researchers' ability to monitor, evaluate and (readjust) their own thoughts and behaviours in order to achieve a set goal. It involves the ability to self-manage their behavioural, cognitive and metacognitive processes, in which they select and adopt regulation strategies (e.g. self-assessment, planning, organisation, time management, goal setting, structuring the physical and psychological environment, seeking help,...) in order to define and implement actions to achieve their personal goals (e.g. acquiring new knowledge and skills, or improving technical skills and knowledge). It also allows one to develop self-assessment, self-knowledge, self-awareness, and self-efficacy as a researcher.

This subdomain illustrates how the RDP could include actions or initiatives that allow researchers to identify areas in which they experience difficulties or need to improve, reflecting and adopting strategies that allow them to overcome these obstacles by monitoring and evaluating their progress and improving research activities.

Examples of possible actions/initiatives/workshops/talks: Time management and the setting of concrete priorities/objectives; Problem-solving techniques; Emotional management; Managing productivity vs. effort load; Defending against self-sabotage; Overcoming career setbacks/unforeseen events; Career management.

### *B2 - Well-being*

The Well-being subdomain refers to the development and care of the researcher's "Self", namely "Taking care of myself", in areas such as: Satisfaction, Productivity, Happiness at work; Dealing with stress and frustration; Management in order to achieve a balance between your professional and personal life.

Examples of possible *actions/initiatives/workshops/talks*: Self-care; Stress management; Mindfulness practices; Healthy habits; Health retreats; Sleep recovery techniques; Coping strategies.

### *B3 - Interpersonal development*

The Interpersonal Development subdomain refers to the researcher's competences to: collaborate effectively with peers, for example through communication; understand the personal characteristics of others; know how to manage and work as part of a team;

#### **Interpersonal development:**

involves improving and/or deepening the researcher's personal competences in order to work as part of a team and in a collaborative manner. It also refers to the competences that enable you to manage your own professional development and take care of your physical and psychological well-being.

#### **Researcher self-assessment**

is a process through which researchers evaluate their own work, performance, or characteristics. Self-evaluation allows researchers to reflect on their strengths, weaknesses, and areas for improvement.

#### **Researcher self-efficacy:**

refers to the researchers' beliefs about their abilities and competences to carry out tasks and achieve goals. Self-efficacy influences the way researchers think, feel, motivate themselves and behave, and can influence their motivation and performance.

#### **Researcher self-care:**

refers to activities that researchers carry out to look after their own physical and mental health. Developing self-care habits makes it possible to manage stress and frustration and promote general well-being (Jones & Whittle, 2021).

#### **Coping:**

is a psychological term that refers to the cognitive and behavioural strategies and resources that the researcher uses to deal with stress and difficult situations. These strategies can involve problem-solving, seeking social support, reinterpreting the situation more positively or dealing with the resulting negative emotions (Lazarus & Folkman, 1984).

know how to resolve conflicts and negotiate constructively; establish relationships of trust and commitment towards common goals; manage and deal with cultural and individual differences; show empathy and respect for the opinions and perspectives of others.

Examples of possible *actions/initiatives/workshops/talks*: Effective communication (active listening, effective feedback, clear communication); Conflict management and resolution; Negotiation; Care and respect for the individuality of others.

#### *B4 - Collaborative work*

The Collaborative work subdomain refers to activities that aim to promote the capacity for mutual support among CIDTFF researchers, in particular the ability to build relationships with others from different generations. It aims to strengthen CIDTFF researchers' sense of community practice in order to work together to build, implement and evaluate a common plan that responds to the needs of researchers as a community.

Examples of possible *actions/initiatives/workshops/talks*: Building CIDTFF's identity together; Getting to know the different Groups and Laboratories; Group dynamics; Collaborative work techniques (*brainstorming*, concept maps, discussion spaces, ...); How to create synergies.

#### *Domain C - Leadership, Management and Funding*

Domain C concerns the development and/or improvement of competences to form, manage and lead national and international teams and projects, attract competitive national and international funding, and establish and/or actively engage in academic and non-academic networks and partnerships. It also concerns knowledge, namely ethics, related to the essential requirements for carrying out research and with regard to data protection and copyright. This domain includes four subdomains: leadership, attracting funding, project management and establishing networks and partnerships.

#### *C1 - Leadership*

Competence to lead heterogeneous and multidisciplinary teams democratically and from a transformational perspective, basing management on concern and consideration for team members, as well as on instrumental competence and its monitoring for the execution of the various tasks. This capacity also implies: a repertoire of knowledge, skills, and attitudes for forming and managing team boundaries; fostering collaborative work; making informed strategic decisions; problem-solving; intellectually stimulating the team; and communicating in an inspiring way, mobilising the team for interventionist action.

Examples of possible actions/initiatives/workshops/talks: Leadership (how to motivate the team, manage teams, make decisions, know how to delegate tasks and functions); Leadership skills *workshops* (essential leadership skills such as effective communication, decision-making, conflict resolution and task delegation); Leadership mentoring (establish mentoring programmes in which experienced leaders can guide and advise other team members in leadership development, offer personalised support, constructive feedback and practical learning opportunities).

#### *C2 - Finance resources/ Income and funding generation*

Competence to identify, secure and obtain the necessary resources and means for financial support for the development of activities and research projects inherent to CIDTFF.

Examples of possible *actions/initiatives/workshops/talks*: Funding proposal writing *workshops* (teaching researchers how to write effective funding proposals, including instructions on proposal structure, how to address the evaluation criteria, writing guidelines and examples of successful proposals from previous years); *Webinars* on relevant topics (e.g. with funding experts in the field



of research and related areas), namely on funding strategies, trends in research, funding policies and practical guidelines to increase the chances of success in attracting funding; Mentoring programmes.

### *C3 - Project management*

Competence to plan, organise and monitor the needs arising from the tasks to be carried out within the scope of CIDTFF's research projects, namely its regulatory processes and resources, as well as the members of its teams, on a personal, relational, and professional level.

Examples of possible actions/initiatives/workshops/talks: Lectures on good project management practices (Invite project management experts to give lectures on good practices, trends, and challenges in the field. Lectures could cover topics such as risk management, effective communication in projects, team leadership and quality assurance); Set up forums, discussion groups or online platforms where team members can collaborate, share experiences, discuss challenges, and find guidance related to project management.

### *C4 - Establishing networks and partnerships*

Competence to create networks and bilateral academic and non-academic partnerships, providing for the sharing and exchange of knowledge among researchers from other partners, and involving, from a collaborative and active participation perspective, various socio-educational actors within scientific research.

Examples of possible *actions/initiatives/workshops/talks*:

Networking events: organise networking events where participants can meet, share interests, and make connections. These events can include conferences, symposia, academic fairs, or informal gatherings.

Exchange and mobility programmes: establish programmes that allow researchers to carry out exchanges and temporary stays at other research institutions or universities, to encourage the creation of lasting links and collaboration among organisations.

Participation in consortia and international projects: encourage participation in consortia and international research projects. These initiatives promote collaboration with researchers from different countries and institutions, enabling the realisation of more comprehensive studies and the exchange of knowledge on a global scale.

### *Domain D - Responsibility, impact, and sustainability*

Domain D concerns the development and/or deepening of skills to carry out research sustainably and responsibly, involving different partners in line with CIDTFF's Social Responsibility Strategy (Araújo e Sá et al 2021), to develop research with a social impact, providing measures for the sustainability of research projects/activities, always taking into account ethical and deontological issues. This domain includes four subdomains: social responsibility; impact of research; research sustainability; ethics, data protection and copyright.

#### **Sustainability (of the research):**

refers to the characteristic of a piece of research being effective in the long term. This covers the design of the research, the conduct of the research, the results of the research and its continuity after the end of the funding period. Sustainable research is financially viable, is based on a pertinent theoretical framework, involves motivated participants with common interests, is capable of involving the community, leads to the production of useful knowledge, uses efficient and sustainable resources, minimises environmental impact, leads to replicable results, leads to new research questions, and ensures its continuity after the termination of the project that gave rise to it (Guerra & Costa, 2016).

#### **Impact of research:**

the longer-term influence or contribution of research to human knowledge. This contribution can be exerted in various dimensions, namely: in the academic dimension when the research distinguishes itself by applying new methods or advancing knowledge; in the social dimension when the results influence society (people and their practices, organisations, systems) and the environment; and in the political dimension when the studies make it possible to formulate policies or provide information to political decision-makers.

This domain of the RDP could benefit from the contribution of the Impact Assessment and Sustainability group (AvIS).

#### *D1 - Social responsibility*

The commitment of the scientific community to the society, expressed through attitudes and actions based on integrity and ethics, which contribute to its development. It is based on a link between the knowledge produced (based on principles of transparency, democratic participation and responsibility) and the expected impact on society.

Examples of possible *actions/initiatives/workshops/talks*: Emerging societal challenges; CIDTFF's Social Responsibility Strategy; Democratisation of Science; Governance; Open Science; Ethical principles; Science Communication.

#### *D2 - Impact of research<sup>2</sup>*

Consequences/effects that the activity/research carried out has on society (people and their practices, organisations, systems), the economy and the environment.

Examples of possible *actions/initiatives/workshops/talks*: Science communication; How do you see/measure the impact of research?; Impact on policies.

#### *D3 - Sustainability of research<sup>3</sup>*

The ability of researchers in a project/research to continue and utilise its results, or their adaptation, after the end of the funding period, providing benefits for the various recipients and stakeholders involved for an extended period.

Examples of possible *actions/initiatives/workshops/talks*: Research sustainability factors (project design, linking the project to the host institution, community involvement, evaluation, and monitoring, ...); Sustainability plan (of the research project); Evaluation of results and processes; Dissemination of the funded research/project and its results.

#### *D4 - Ethics, data protection, copyright*

The ability to promote and maintain a relationship with all research participants based on fundamental principles such as respect and individual dignity (of each person as a human being), protecting and defending all those involved (especially those in the most vulnerable situations) and acting at all times following the principles enshrined in the Universal Declaration of Human Rights and the various United Nations conventions on the protection and promotion of universal rights.

Examples of possible *actions/initiatives/workshops/talks*: Free and informed consent; Confidentiality, respect, and privacy; Data protection (European Union GDPR); Disclosure of information; Well-being and integrity; Copyright (authorship and co-authorship).

### **3.2. Development of the researcher's "Self" (individual and collective)**

The construction of the researcher's "Self" is a crucial process for the development of the researcher as a person and of CIDTFF as an entity dedicated to research, both of which with an identity to be developed. This process of developing the researcher's "Self" (individually and collectively) is essential for building new knowledge. In this process, the text "Contributos para um pensamento

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<sup>2</sup> The AvIS group could contribute

<sup>3</sup> The AvIS group could contribute

sobre dimensões relevantes da investigação no CIDTFF” (Lopes et al. 2023) may be important for framing this collective endeavour.

We therefore propose an understanding of the construction and development of the researcher’s “Self” based on the concepts of the individual and the collective researcher’s “Self” and the dynamics that are established between individual and collective knowledge, and tacit and explicit knowledge.

For further clarification of the ideas and concepts in this section, a reasoned and more detailed version can be read in Annex 1.

### 3.2.1. Building the individual and collective researcher’s “Selves”

The dynamics that are established among the different types of knowledge and their importance in understanding the development of the researcher’s “Self” require a clarification of the concepts of the individual researcher’s “Self” and the collective researcher’s “Self”.

#### *Building the individual researcher’s “Self”*

It is the individual researcher’s “Self” who experiences the effort and pleasure of choosing what to focus on and how to focus on it. It’s a subjective and often tacit decision. There is usually an initial, individual, subjective, and tacit act that is responsible for the choice of the object of study that has captured the interest of the researcher’s “Self” about which it generates questions for which it does not yet have answers.

The “look” at a fragment of reality (or object of study) from a particular perspective (theoretical and teleological) is what triggers the entire research effort to obtain answers and descriptions of the object of study. In the social sciences, the most important issue is that there can be different perspectives on the same fragment of reality and, consequently, different descriptions and interpretations. It is in these multiplicities, each based on a particular perspective, which is explicit, that a broader understanding can be achieved, insofar as from multiple descriptions and interpretations it is possible to construct other more complete, more abstract, and more complex descriptions (Mugur-Schächter, 2006).

On the other hand, the individual researcher’s “Self” is the primary source of tacit knowledge. In Nonaka and Toyama’s model, it is through socialisation with other individuals in each environment that the conditions are created for individual tacit knowledge to be built up to its greatest extent (see Figure 3).

#### *Building the collective researcher’s “Self”*

The collective researcher’s “Self” refers to the creation of collective (organisational) knowledge and is defined as the capacity of an organisation/group as a whole to create new knowledge, disseminate it throughout the organisation and incorporate it into its products, services and systems (Nonaka & Toyama, 2003).

For the authors, the creation of collective (organisational) knowledge implies considering two dimensions: the epistemological

**The individual researcher’s “Self”:** the competence of an individual, possibly as part of a research team, to mobilise beliefs, attitudes, motivations, values, and knowledge to create, for example, a focus of study and contribute to creating new knowledge, disseminating it throughout the organisation and incorporating it into its products, services and systems (Mugur-Schächter, 2006).

**The collective researcher’s “Self”:** this is defined as the ability of an organisation/group, as a whole, to mobilise collective beliefs, attitudes, motivations, values and knowledge to create, for example, a research focus and generate new knowledge, disseminate it throughout the organisation and incorporate it into its products, services and systems (Mugur-Schächter, 2006; Nonaka & Takeuchi, 1995, 2007).

**Teleological:** considering the object to be known by its behaviour (purposes) and not by the immediate causes that regulate it (a law); it is a question of moving from analysis to the design of a solution with an explicit purpose (Le Moigne, 1994).

**Socialisation in research processes:** this is an active process of learning and change through which the researcher acquires the knowledge, language, social norms, values, and habits needed to participate in and integrate a group or community of researchers (Gardner, 2008). It is through socialisation with other researchers in each environment that the conditions are created for the construction of tacit, multiple, and varied knowledge.

dimension (tacit knowledge and explicit knowledge) and the ontological dimension (the subject of research). The ontological dimension is organised along a *continuum* that stretches from the individual at one end to the organisational at the other, passing through the group (which, in the case of CIDTFF, includes the Research Groups, Laboratories, the thematic projects. Nonaka and Toyama (2003) explain how individual knowledge is converted into group and organisational knowledge, providing some clarification on the development of the individual researcher's "Self" and the collective researcher's "Self" and how these are related. This conversion takes place through the interaction between tacit and explicit knowledge and between the epistemological and ontological dimensions (see next paragraph, figures 3 and 4 and appendix 1).

### 3.2.2. Dynamics between individual and collective knowledge and between tacit and explicit knowledge

Figure 3 shows the dynamics of interaction and development between tacit and explicit knowledge.

According to Figure 3, individuals need to socialise with others to generate tacit knowledge of an individual nature. When they share it with others in a properly orchestrated externalisation process, individual and collective knowledge of an explicit nature can be generated. If knowledge from different groups is shared within the context of an organisation (e.g. CIDTFF), a combination of conceptual knowledge can take place, giving rise to more intelligible, more abstract, and more transferable knowledge. For this virtuous cycle to feed itself, there must be a process of **internalisation**, which is essentially an individual process.

Figure 4, based on the work carried out by Nonaka and Takeuchi (1995), shows a spiral of organisational knowledge creation adapted to the context of CIDTFF. For these authors, the construction of organisational knowledge can be explained by considering the epistemological and ontological dimensions and the interaction between tacit and explicit knowledge.

The development of organisational knowledge involves considering the epistemological and ontological dimensions and the interactions established between tacit and explicit knowledge along the *continuum* of the ontological dimension. The interaction between tacit and explicit knowledge forms a spiral that rises dynamically from a lower ontological level (the individual) to a higher ontological level (CIDTFF as an organisation). This spiral is fed by the four modes of knowledge conversion (socialisation, externalisation, combination and internalisation, see Figure 3). In this context, socialisation converts tacit knowledge into tacit knowledge, but involves more individuals and groups, and externalisation converts tacit knowledge into explicit knowledge, involving more individuals and groups. What is called Combination converts explicit knowledge into explicit knowledge but involves more groups. Internalisation converts explicit knowledge into tacit knowledge, with the individual once again predominating.

In summary, what Nonaka and Takeuchi proposed, but adapted to the context of CIDTFF (see Figure 4), consists of a theory to explain the phenomenon of building organisational knowledge. For the authors,

**Internalisation:** refers to the process by which the researcher assimilates and integrates knowledge, attitudes, values, behaviour patterns and beliefs from society or their immediate environment into their own belief systems, in a conscious or unconscious way (Nonaka & Takeuchi, 1995, 2007).



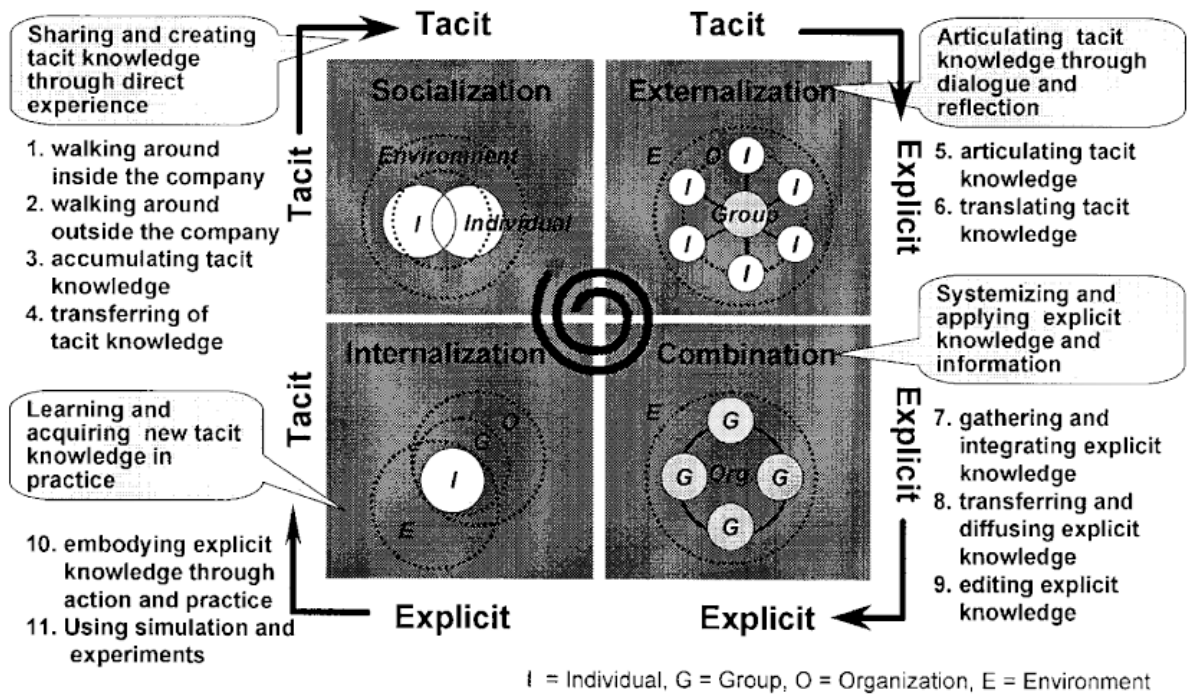


Figure 3 - Knowledge construction model of the collective "Self" proposed by Nonaka & Toyama (2003, p. 5)

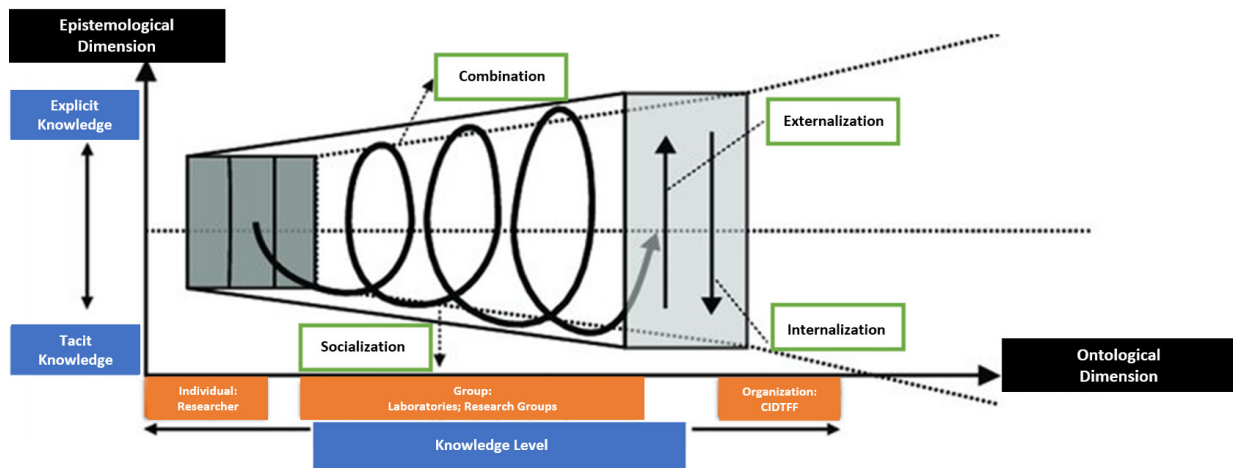


Figure 4 - Organisational knowledge building spiral proposed by Nonaka & Takeuchi (1995) adapted to the context of CIDTF - Researcher's collective "Self".

the construction of organisational knowledge can be defined as the capacity of an organisation/group as a whole to create new knowledge and disseminate it throughout the organisation and incorporate it into their products, services, and systems. Initially, knowledge is built up individually and afterwards becomes organisational knowledge. In the epistemological dimension, the authors recognise two types of knowledge: tacit knowledge (which emerges from the experience of the individual and the organisation) and explicit knowledge (which can be written down and transferred). The ontological dimension is organised in a *continuum* that goes from the individual, at one end, to the most sophisticated organisational level, passing through intermediate organisational levels (e.g. team, group).

### 3.2.3. Implications of the dynamics between individual and collective knowledge and between tacit and explicit knowledge for a researcher development plan

Tacit knowledge (fundamentally experiential) is what drives conceptual and explicit knowledge, which can be shared and reconstructed within a group and then within an organisation. However, explicit knowledge allows us to extend the possibilities of tacit knowledge, increasing the quality and diversity of what we can and know how to do. There is thus a symbiosis between the individual, the group, and the organisation, which needs to be understood, structured and nurtured.

In this dynamic of knowledge construction, the researcher's "Self" is always present, whether in the form of individuals, groups, or organisations. Tacit knowledge can also be found in individuals, groups, or organisations. Nevertheless, the primary source of tacit knowledge is the individual and the primary source of explicit knowledge is the collective.

According to the conceptualisation presented in this section, the most important steps that need to be taken to build the researcher's "Self" (in individual and collective terms) are:

- **The individual researcher's "Self" must:**
  - (a) build and develop an identity as a researcher;
  - (b) acknowledge the subjectivity of choices and assumptions (e.g. choice of object of study that excites, theoretical perspective adopted);
  - (c) realise what one knows and doesn't know how to do;
  - (d) adopt effective processes for internalising the explicit knowledge available at CIDTFF and in the international community.
  
- **The researcher's collective "Self", has to organise the processes of:**
  - (a) socialisation to build multiple and varied tacit knowledge;
  - (b) sharing different tacit knowledge;
  - (c) combination of different explicit knowledge;
  - (d) individual internalisation of the explicit knowledge generated within the organisation (the organisational processes of the institutions are also important for developing the individual researcher's "Self").

**Explicit knowledge:** this is the type of knowledge that can be articulated, documented, codified, and easily shared with others. This knowledge usually involves facts, data, concepts, rules, or instructions that are consciously acquired and easily expressed or explained. It is through the internalisation of more explicit knowledge, incorporating it into action and practice or through experimentation or simulation, that it is possible to increase the repertoire of individual tacit knowledge (Nonaka & Takeuchi, 1995, 2007).

**Identity (of the researcher):** how researchers see themselves about their work, which can be influenced by a variety of factors, including the area of specialisation, academic training, culture and personal background. A researcher's identity is flexible and can evolve over time as they accumulate experience, knowledge, and new perspectives, particularly through socialisation with peers (Castelló et al., 2021).

### 3.2.4. Building the researcher's identity: recognising subjectivity as the starting point for setting the epistemic actor in motion

The subjectivity and intersubjectivity of the research process and the construction of knowledge are recognised in the literature by various authors. Being a researcher implies recognising and assuming this subjective (individual) dimension and how this subjectivity can affect the researcher's relationship with the object under study, with the construction of knowledge and with the context in which he or she is inserted. It means assuming the status of an **epistemic actor** or epistemic subject.

The concept of subjectivity is not new, especially in the context of qualitative research. The subjectivity of the research process and the construction of knowledge is recognised in the literature by various authors. Being a researcher implies recognising and assuming this subjective (individual) dimension and how this subjectivity can affect the researcher's relationship with the object under study, with the construction of knowledge and with the context in which he or she is inserted.

The construction of knowledge is a process based on reality seen from a particular perspective - that of the researcher. In the process of constructing knowledge, the researcher is not free from the context(s). The social, cultural, and historical contexts in which the researcher is inserted are the frames of reference that allow him or her to interpret information and create meanings.

Various understandings of this concept can be found in the literature. According to Cruz (2015), two types of subjectivity can be distinguished: explicit subjectivity and implicit subjectivity. For the author, explicit subjectivity is a type of subjectivity that researchers are more aware of and recognise as such from the outset. This dimension of subjectivity is present in the explicit decisions regarding the research design, specifically in decisions concerning the ontological, epistemological, and methodological dimensions of the research (Crotty, 2003).

The implicit dimension of the researcher's subjectivity is not always recognised and can even be denied. During the research process, and especially during the empirical study, some aspects of "hidden" (tacit) subjectivity can begin to emerge. When researchers begin to question their preconceptions (whether positive or negative), they can begin to make explicit what is "hidden" (implicit assumptions begin to surface) in their frames of reference (e.g. theoretical, symbolic).

This self-reflexive process of questioning and confronting the researcher's frames of reference with the object under study and the context in which it is inserted allows the implicit dimensions of subjectivity to emerge (in addition to the explicit ones, which are conscious to the researcher) and highlights the importance of reflexivity as an instrument at the service of the construction of the epistemic "Self".

*Reflexivity in research: an instrument for raising awareness of subjectivity (being aware of subjectivity as a researcher)*

Each researcher has his or her own frames of reference (theoretical, symbolic, etc.) which determine the way one "sees" the object under study and the way it relates to others and to the context in which it is inserted (reality).

**Epistemic actor:** an individual or collective subject who assumes agency in the construction of knowledge, i.e., takes on the status of an active agent in the process of producing and disseminating knowledge (Mugur-Schächter, 2006, Lopes et al. 2023).

Perhaps the first challenge for reflexivity is to acknowledge, debate and justify the ontological, epistemological, and methodological conceptions of the researcher (explicit subjectivity). “It is the ontological limits of being in the world that will determine the epistemological and methodological options for building knowledge that is both multi referential and personal because, although situated, it emerges through the personal interpretation of each researcher” (Sá-Chaves, 2013, p. 25).

But we need to go further and acknowledge the implicit dimension of the decisions made as researchers and make them explicit.

### *Reflexivity and self-regulation as working tools for building the researcher’s “Self”*

An academic career requires working in research, teaching and administrative work processes that require the management of various tasks, experiences, and behaviours over time or at specific stages of the career (Zacher, Rudolph, Todorovic & Ammann, 2019).

Reflexivity involves a continuous process of reciprocal training between the researcher and the research institution. This process makes it possible to enrich the experience through an awareness of the phenomena and processes of interaction between the researcher and the context. The researcher deepens the understanding of the experience and becomes capable of building a coherent and harmonious research practice (Attia & Edge, 2017). The continuous construction of this congruent practice entails a balance between professional principles and professional behaviours in reality, an openness to new ways of being and knowing, values and competences (ibid.).

According to Mann (2016), reflexivity is bidirectional and mutually formed with the context, focusing on the “Self” and the intersubjectivity and interactions with the context. Thus, reflexivity integrates human development and the cycles of retrospective and prospective reflexivity allow for a conscious evolution of “the researcher” as a whole (Attia & Edge, 2017). It is seen as a way of valuing the subjectivity of researchers (Olmos-Vega et al., 2023).



## **4. RESEARCHER DEVELOPMENT PLAN FOR CIDTFF [CIDTFF\_RDP\_2023-2026]**

This section is the operational part of the CIDTFF\_RDP\_2023-2026 and has the following components:

- Key process for building the researcher's "Self" (individual and collective) (section 4.1)
- A self-assessment tool for the RD by domain (section 4.2)
- A self-assessment tool for the collective researcher's "Self" (section 4.3)
- Structuring training offer for 2023-2026 (actions by domains and years; processes for building the individual and collective researcher's "Self"; proposals for actions to build the collective "Self"). This proposal is open to suggestions and improvements (section 4.4).
- Framework to promote other proposals or initiatives to be included in the RDP in 2023-2026 (section 4.5).

Important Note:

Attention is drawn to the open nature of this plan, which welcomes proposals and suggestions for action (see form in section 4.5.1).

### **4.1. Key process for building the researcher's "Self" (individual and collective)**

#### **Key process for building the researcher's individual "Self"**

The researcher as an epistemic subject must take the following processes into consideration:

- a) Develop one's identity as a researcher;
- b) Acknowledge one's subjectivity in the choices to be made and in the assumptions implicitly or explicitly admitted (e.g. choosing the fragment of reality that excites me, the theoretical perspective I adopt); how do you make implicit assumptions explicit?
- c) Become aware of what one knows and doesn't know how to do;
- d) Adopt effective processes for internalising the explicit knowledge available;
- e) Reflecting on research (an instrument for raising awareness of subjectivity - being aware of subjectivity as a researcher);
- f) Use self-regulation tools frequently.

#### **Key process for building the collective researcher's "Self":**

The collective researcher's "Self", i.e. CIDTFF as an organisation, is supposed to encompass the following processes (see section 3.2.1):

- a) socialisation to build multiple and varied tacit knowledge;

- b) sharing different tacit knowledge;
- c) combination of different explicit knowledge;
- d) individual internalisation of the explicit knowledge generated within the organisation.

## 4.2. A self-assessment tool for the individual researcher’s “Self”

This section proposes a self-assessment tool for *researcher development*. The 4 domains presented in section 3.1 were used as a basis.

What is missing from this self-assessment is a dimension more geared towards reflection on the epistemic “Self” and more open to discussion. A reflection that could be guided by questions such as:

- Who am I as a researcher? What are my frames of reference? What are my values? What are my most significant experiences?
- Once you’ve acknowledged your subjectivity as a researcher, what should you investigate?
- How to investigate? With whom to investigate? (the dimension of the other is fundamental)
- What is the relationship between subjectivity and the construction of the epistemic “Self”? Why investigate?

DOMAIN	DESCRIPTOR	LEVEL (1-3) - Low - Medium - Strong
<b>Domain A - Training in scientific research and supervision</b>		
This domain concerns the development and/or deepening of a set of theoretical and technical competences needed to carry out research in the social sciences and humanities and engage in scientific supervision activities.		
A1. Knowledge base	I have the knowledge base needed to research in “my area/ domain” and produce relevant scientific knowledge.	
A2. Scientific literacy	I understand and use scientific knowledge to make informed decisions on science-related issues (e.g. the ability to understand basic scientific concepts, understand scientific processes, evaluate scientific evidence, and use this information to make decisions).  I recognise and consider the cultural values and communicative repertoires of a given discipline.	
A3. Research methods and techniques	I know, understand, and can apply/use relevant and diverse research methods and techniques.  I apply theoretical knowledge about specific methods, strategies, and procedures for collecting and analysing data in the social sciences and humanities in a way that is well-founded and appropriate to my area of research and the project underway.	
A4. Scientific supervision	I can guide/support the development of a trainee researcher, providing scientific and constructive feedback on the work carried out.  I guide the development of scientific work according to ethical principles and rigorous methodological standards.  I promote the development of competences necessary for the trainee researcher to become independent and successful in their field of study.	

<p><b>Domain B - Interpersonal development and well-being</b></p> <p>This domain concerns the development and/or deepening of (inter)personal competences and personal qualities that enable the researcher to be effective, to work in a team and in a collaborative manner. It also refers to the competences that allow them to manage their own professional development and take care of their physical and psychological well-being.</p>		
B1. Self-regulation	<p>I regulate, monitor, evaluate and (readjust) my thoughts and behaviours to achieve a set goal.</p> <p>I'm able to self-manage my behavioural, cognitive, and metacognitive processes, selecting and adopting various regulation strategies (e.g. self-assessment, planning, organisation, time management, setting objectives, structuring the physical and psychological environment, seeking help, etc.) that allow me to define and implement actions to achieve my personal goals.</p>	
B2. Well-being	<p>I am attentive to my well-being and promote the development and care of my "Self" (addressing areas such as Satisfaction, Productivity, Happiness at work; Dealing with situations of stress and frustration; emotional management), balancing personal and professional life.</p>	
B3. Interpersonal development	<p>I communicate and collaborate effectively with other people in order to understand, accept and respect the personal characteristics of others.</p> <p>I resolve conflicts and negotiate constructively, respecting and valuing cultural and individual differences.</p> <p>I'm empathetic, I respect and value other people's opinions and perspectives different from mine.</p> <p>I establish relationships of trust and commitment in order to achieve common goals.</p>	
B4. Collaborative work	<p>I promote activities aimed at encouraging mutual support between CIDTFF researchers, the ability to build relationships with others (from different generations).</p> <p>I can work together to build, implement and evaluate a common plan that responds to the needs of researchers as a community.</p>	
<p><b>Domain C - Leadership, management, and financing</b></p> <p>This Domain concerns the development and/or deepening of competences to form, manage and lead national and international teams and projects, attract competitive national and international funding, and establish and/or become actively involved in academic and non-academic networks and partnerships. As well as knowledge related to the essential requirements for carrying out research, namely ethics, data protection and copyright.</p>		
C1. Leadership	<p>I lead heterogeneous and multidisciplinary teams democratically and from a transformational perspective, basing management on concern and consideration for team members, as well as on instrumental competence and its monitoring for the execution of the various tasks.</p> <p>I have a repertoire of knowledge, skills and attitudes that enable me to: form and manage team boundaries; foster collaborative work; make strategic decisions; solve problems; intellectually stimulate the team; and communicate in a way that inspires and mobilises the team to act.</p>	

C2. Finance resources/ Income and funding generation	I identify, secure, and obtain the necessary resources and means for financial support for the development of the activities and research projects inherent to CIDTFF.	
C3. Project management	I am able to plan, organise, and monitor the needs arising from the tasks to be carried out within the scope of CIDTFF's research projects, namely its regulatory processes and resources, as well as those of the members who make up its teams, on a personal, relational and professional level.	
C4. Establishing networks and partnerships	I create networks and bilateral academic and non-academic partnerships, providing for the sharing and exchange of knowledge among researchers from other institutions, and involving in a collaborative and active participation perspective, various socio-educational actors within scientific research.	
<b>Domain D - Responsibility, impact, and sustainability</b>		
This domain concerns the development and/or deepening of competences to carry out research sustainably and responsibly, involving different partners in line with CIDTFF's <i>Social Responsibility Strategy</i> , to develop research with a social impact, providing measures for the sustainability of research projects/activities and taking ethical and deontological issues into account.		
D1. Social responsibility	I assume the commitment of the scientific community to society through attitudes and actions guided by integrity and ethics.  I contribute to the production of scientific knowledge based on principles of transparency, democratic participation, and responsibility, foreseeing the expected impacts on society.	
D2. Impact of research	I reflect on and foresee the consequences that the activity/ research carried out and its results have on society (people and their practices, organisations, systems), the economy and the environment.	
D3. Sustainability of research	I anticipate and make sure that it is possible to continue using the research results after the end of the funding period, providing benefits to the various recipients and stakeholders involved for an extended period of time (after the financial assistance has ended).	
D4. Ethics, data protection, copyright	I promote and maintain with all the participants of the research a relationship based on fundamental principles such as respect and individual dignity (of each person as a human being).  I protect and defend all those involved in the investigation (especially those in the most vulnerable situations) and endeavour to act at all times in accordance with the principles enshrined in the Universal Declaration of Human Rights and the various United Nations conventions on the protection and promotion of universal rights.	

### 4.3. A self-assessment tool for the collective researcher's "Self"

This tool was designed by the *Researcher Development* group at CIDTFF and its main objectives are as follows:

- a) Identify the actions and/or processes of researcher development carried out by CIDTFF's structures (research lines, laboratories, CIDTFF coordination, etc.) in a given period;
- b) To support the systematisation of researcher development experiences by different CIDTFF structures;
- c) Allow the *Researcher Development* Group to monitor the evolution of the collective "Self".

The tool is made up of three sections that include a set of questions and proposals for joint reflection:

- a) Identification of actions and/or proposals;
- b) Systematisation of experiences;
- c) Prospects/proposals for the future.

The proposals for reflection follow a methodology for systematising experiences. This is a process of critical interpretation of one or more experiences which, by ordering and reconstructing them, aims to uncover or explain the process that has taken place, making it possible to share learning and orientate experiences towards the future from a transformative perspective. Filling in the document is the responsibility of the coordinator of the structure (research group, laboratory, CIDTFF coordination). However, all its members should contribute to it, if they have participated in some way in the action/process to be systematised. In this way, the document represents an opportunity for critical reflection, mutual learning, and the construction of collective thinking.

## **Structure of the self-assessment tool for the collective researcher's "Self"**

### *Section 0 - Header*

- Identification of the structure (laboratories, line of research, programmatic project, CIDTFF coordination):
- Name of the person who filled in the document:
- Date:

### *Section I - Identification of actions and/or processes*

- Identification of the action/process (name/designation)
- Type (talk, round table, workshop, seminar, etc.)
- Date
- Duration
- Objectives
- Facilitator(s)
- Members present
- Brief description of the action/process (150 words)
- Domain and subdomain
- *(add new table for each action/process)*

### *Section II - Systematisation of experiences*

#### *Introductory note:*

*To systematise the experiences and the process, it is essential to have participated in them in some way. It is also essential that records have been kept during the experience and that there are: notebooks; reports; minutes and other documents produced. It's also important to make recordings, videos, drawings, save news relating to the dissemination of the action, etc.*

Questions to support the systematisation of the proposed experiences:

1. What motivated us to propose this action/process?
2. What results have been achieved?
  - a) about the planned objectives
  - b) unforeseen results

3. What did the participants report they had learned?
4. What moment(s) can be highlighted as the most significant?

*(questions should be asked for each action/process)*

### *Section III - Perspectives/proposals for the future*

1. What lessons can we learn from this action/process?
2. How can they be useful for our future in terms of researcher development?
3. What recommendations would we give to others who want to develop similar actions/processes?
4. What actions/processes do we want to develop in the future? Why?

*(questions should be asked for each action/process)*

## **4.4. Structured training programme for 2023-2026**

### **4.4.1. Group responsible for receiving proposals for actions and for deciding which ones to be implemented**

Since the second part of the mission of the group that drew up this plan is to “accompany and monitor the implementation of the plan and the planned actions, as well as evaluate” their results and effects on the development of the individual and collective researcher’s “Selves”, it is necessary for the CIDTFF Coordination to set up a group of researchers responsible for receiving the proposals for actions and deciding which ones will be implemented. Thus, the proposal from the group that drew up this plan is as follows: With regard to the training programme, at the end of each calendar year the CIDTFF Coordination should appoint a group of researchers who will be responsible for receiving the proposals for actions and deciding which of these will be implemented for **the individual researcher’s “Self” by domain** and for **the collective researcher’s “Self”** in the following calendar year and also implement the actions that are already provided for in this plan.

### **4.4.2. Actions for the Individual Researcher’s “Self” by domain**

#### *Plan for 2023-2024*

Here are some proposals for actions or initiatives to be carried out in 2024. This first proposal came from the WG itself, but also from prior informal consultation with some CIDTFF researchers:

#### *Domain A - Training in scientific research and supervision*

- 1) Workshop/training on Quantitative Methods with peers from CIDTFF or the Mathematics Department.

#### *Domain B - Interpersonal development and well-being*

- 1) Cycle of talks on “Happiness at work” with the collaboration of different experts.

#### *Domain C - Leadership, Management and Financing*

- 1) Leadership workshop run by experienced leaders (dimensions of leadership and mentoring: offering personalised support, constructive feedback, and practical learning opportunities).

#### *Domain D - Responsibility, impact, and sustainability*

- 1) Webinar “The Why and How of Research” reporting and demonstrating societal impact by AESIS Network.

#### *Proposals to take place in 2024, 2025 and 2026:*

The proposals for 2024, 2025 and 2026 are at the definition stage, which will depend on consultation with CIDTFF researchers.

Different formats (e.g. round tables, lectures, formal seminars or information seminars, workshops, webinars, etc.) of actions and processes that are duly appropriate to the domains and subdomains of the RDP framework (cf. the examples presented in subsection 3.1.1 “The domains of researcher development”) are expected.

To collect this information, the WG intends to use the following mechanism:

- a) To identify needs and prioritise the implementation of actions, the WG intends to carry out a survey using the following questionnaire to sound out researchers (see Annex 2 - Questionnaire to assess the interests and needs of CIDTFF researchers for its RDP).
- b) To receive new proposals, the WG is also accepting suggestions for actions/initiatives/workshops/talks. To do so, researchers can use the following form to submit their proposals (see Section 4.4. Reference/Form for framing other proposals or initiatives in 2023-2026).

After this information gathering, which will take place annually, the data will be analysed and categorised in order of priority (defined by the common interests and needs of the researchers). After this processing, a timetable (plan) will be proposed with dates for carrying out the actions and processes indicated/suggested.

#### **4.4.3. Actions to build the collective researcher’s “Self”**

Different types of dynamics are acceptable for the processes to be implemented to build the collective researcher’s “Self”. See the theoretical and practical framework in 3.2 and 4.1 of this document.

Everyone is therefore asked to consider this reference in their proposals for this component of the RDP.

The following are proposals for each of the stages in the construction of the collective “Self” referred to in 3.2.1 and 4.1.

To build the collective researcher’s “Self”, the CIDTFF, in its different organisational bodies, has to prepare, implement and monitor the following processes, which are explained below:

- a) socialisation to build multiple and varied tacit knowledge;
- b) sharing different tacit knowledge;
- c) combination of different explicit knowledge;
- d) individual internalisation of the explicit knowledge generated within the organisation (via all the entities that make up the collective “Self”).

#### *(a) socialisation to build multiple and varied tacit knowledge*

The laboratories are functional structures of CIDTFF that articulate three dimensions - research, training and community liaison - and are one of the centre’s hallmarks. These spaces are best suited to promoting the socialisation of CIDTFF researchers, to contribute to the construction of multiple and varied tacit knowledge. In the laboratories, informal socialising spaces can be created, as well as more formal moments for discussing ongoing research or future lines of action and research (through seminars or gatherings) which, on the one hand, allow people to see and feel



what their peers are doing, creating individual and collective explicit knowledge and, on the other hand, sharing and reconstructing tacit knowledge, increasing the quality and diversity of what they can and know how to do.

The challenge in this respect is that these dynamics should be explicit, not require extra effort, be known by everyone and also periodically reflect on whether they are fulfilling this role. Consideration should be given to the fact that many CIDTFF members are not part of laboratories and that this circumstance deserves special attention in this plan to be realised by the collaboration of members who are in this situation.

*(b) sharing different tacit knowledge;*

Regular informal seminars presenting what is being done by each research line (e.g. SEDE) with the explicit aim of sharing knowledge built up within the activities of individuals, small groups, or research teams.

The proposal (... name still to be defined...) developed by the SEDE Group is part of this plan. The group is made up of CIDTFF researchers Xana Sá-Pinto, Francisco Parrança; Betina Lopes, Mariana Alves, and Daniela Pedrosa.

The SEDE group proposes to promote discussions/seminars on CIDTFF and the research it produces, as well as on key publications from the international community on topics of interest to the centre's researchers, regularly and in the form of informal talks. The themes of these talks will be aligned with the lines of action of the CIDTFF coordination and the Researchers' Development Plan.

The regularity of this proposal is based on it being held on a rotating basis each month as follows:

- An event to discuss/co-construct the CIDTFF project and regulatory documents, coordinated by the CIDTFF management;
- Two events to present work carried out by CIDTFF researchers (open to PhD students, PhD researchers - full-time researchers and professors), coordinated by the SEDE Group with the support of the coordinators of the Laboratories;
- An event to present a publication by the international community with authors from outside CIDTFF, coordinated by the SEDE Group with the support of the coordinators of the Laboratories.

*(c) combination of different explicit knowledge;*

Combining different explicit knowledge is a powerful approach to promoting innovation and creativity in research. This combination of explicit knowledge is facilitated by tackling a societal problem that is recognised as important and requires the mobilisation of knowledge from different specialities. This combination will be facilitated if the following aspects are present:

*1 - Contact/socialisation:*

Set aside time for contact with the actors and realities of the chosen societal problem. This allows participants to get to know the actors and the reality they want to shine a light on better, create social bonds and develop an atmosphere of collaboration.

*2 - Sharing what has been done and what is being done:*

Create an open environment for questions, discussions, and the exchange of ideas among participants. This part allows researchers to get to know each other's work and identify possible synergies and opportunities for collaboration.

*3 - Brainstorming to find ways forward:*

Encourage the free expression of ideas and the contribution of different perspectives and stimulate the production of innovative solutions by combining different explicit knowledge to propose a solution to a previously identified problem.



#### 4 - Define a roadmap for the investigation:

Establish a realistic roadmap for outlining the research and the articulation between the participants with the research focus, the research problem to be solved and the contribution that each one can make to solving it through the research tasks in which they can get involved.

For organising these events to combine explicit knowledge we propose:

- Forming a rotating group of dynamisers, with representatives from each research group, appointed by the CIDTFF coordinators.
- Ensuring that there is a balanced representation of different research areas in the group, to promote diversity of knowledge and perspectives.

#### (d) individual internalisation of the explicit knowledge generated within the organisation.

The individual internalisation of explicit knowledge generated within the organisation (CIDTFF) can be done in different ways depending on which organisational level we are focusing on (laboratories, research lines or CIDTFF as a whole).

- As it is relevant that the individual internalisation of the knowledge generated within the organisation is elaborated in new experiential contexts, it is important that:
- Researchers can spend part of the day in another CIDTFF laboratory (or even other projects). In other words, create a periodic open event in which a laboratory (or other organisation) hosts other CIDTFF members.
- Researchers can have short-term internships in other laboratories at home or abroad.
- Support for the creation of national and international networks and partnerships for specific purposes.
- CIDTFF should set up internal projects with the intention of creating the conditions to bring together researchers, lines of research, laboratories, and ideas to solve a relevant problem. The same problem could be the subject of the annual retreat.
- CIDTFF should encourage researchers to concretise their commitment to production in new partnerships by boosting the production of products of academic activity (articles or others) in unprecedented international partnerships.

#### 4.4.4. Proposals for actions to build the collective researcher's "Self"

In this subsection, we present several ideas so that the entities of the collective "Self" (Coordination of CIDTFF, Research Groups, Laboratories, and other small groups) can be inspired to realise and develop proposals for actions that foster the 4 processes for building the collective "Self" explained in the previous point, over the next few years (2023-2026).

##### *CIDTFF Laboratories*

It is recommended that each CIDTFF laboratory commit to planning concrete actions to foster spaces for socialisation and discussion, by organising seminars, gatherings and other actions of interest to the researchers in that laboratory, assuming the commitment to report the results obtained from these actions through the "collective" self-evaluation instrument.

An example of a common periodic event is the one organised by LabDCT and Lem@tic, which jointly organise an annual event for teachers called "Matemática Com Vida" (Mathematics with Life). Another type of activity could be for the different CIDTFF laboratories to organise a "DayEduca\_LAB" (suggested name), in which the laboratories are responsible for organising activities/visits to their spaces and projects for researchers from other laboratories. The figure of the lab liaison officer, which existed in the past, could be reactivated.

Another example of an action that the Laboratories can take are short internships in which they host CIDTFF researchers from other laboratories with the aim of greater internal cohesion and mobilising scientific collaboration activities such as funding scholarship applications, organising events, networking, etc.

Another possibility could be the Laboratories' internal days or informal gatherings, with moments to share work in progress and initiatives, not forgetting moments to socialise.

It is therefore recommended that each laboratory plan, organise and evaluate at least one of these actions (or other relevant proposals) per academic year.

### *Small research groups or laboratory groups*

Articulate with the SEDE Group a planning proposal, dynamising and evaluating events to present projects, readings, papers, etc. for discussion and debate that feed collective reflection around a CIDTFF line of research.

### *Coordination of CIDTFF and/or Research Lines and/or Programmatic Projects*

Four types of initiatives are proposed for this level of the organisation: (a) Annual Retreat; (b) Scientific Internships; (c) Networks of national and international partners; (d) Formation of interdisciplinary teams.

For each of these initiatives, an annual team of researchers (rotating each year) should be defined, with representatives from each research group, appointed by the CIDTFF coordinators, to organise, streamline and evaluate each initiative, considering the 4 aspects necessary for building the collective researcher's "Self" described in section 4.4.2 and providing all the logistical and financial support that may be necessary.

#### *(a) Annual Retreat*

We propose an annual 3-day retreat with people from different research groups around a specific challenge (for example, defining the focus of CIDTFF's research and how it differs from that of other centres). For the organisation and running of the retreat, we propose time and spaces for the following aspects:

- 1 - Recreational/socialising aspect: Set aside time for recreational activities such as games, outdoor walks or other forms of entertainment. This aspect allows participants to get to know each other better, create social bonds and develop an atmosphere of collaboration.
- 2 - Sharing what has been done and what is being done: allow each participant to present and share their research and current projects. Create an open environment for questions, discussions, and the exchange of ideas among participants. This part allows researchers to get to know each other's work and identify possible synergies and opportunities for collaboration.
- 3 - *Brainstorming* for a purpose: select a specific topic or challenge for participants to *brainstorm* in groups. Encourage the free expression of ideas and the contribution of different perspectives. This strand aims to stimulate creativity and the production of innovative solutions by combining different explicit knowledge to solve a previously identified problem.
- 4 - Individual production commitment: ask each participant to establish an individual production commitment related to their research. This can include setting specific goals, such as writing an article, developing a project, looking for partnerships, creating an educational resource, and expanding the network of contacts, among others. Set a realistic deadline for the completion of these goals and encourage mutual accountability among participants.

To organise this event, it is necessary to ensure that:

- a) there is a balanced representation of different research areas in the group, to promote diversity of knowledge and perspectives.
- b) the retreat takes place in an appropriate location, with an atmosphere conducive to creativity, collaboration, and reflection.

This retreat model provides a combination of fun moments, knowledge sharing, *brainstorming* and individual production commitments. It promotes the integration of different lines of research and stimulates interdisciplinary collaboration, allowing researchers to explore new ideas, set concrete goals and develop strategic partnerships.

#### *(b) Scientific internships*

Another example of action that CIDTFF coordination can provide for its researchers is to identify internship sites in other laboratories or centres, define formal collaboration protocols and open calls for researchers to apply for grants to fund these scientific internships.

#### *(c) National and international partner networks*

Another example of action on the part of the CIDTFF's coordination will be to support the creation of strategic networks of national and international partners, either through incentives (funding for projects that integrate different partners, be they schools, other research centres, etc.) or by facilitating ("creating bridges") contact so that partnership networks can be created with institutions which CIDTFF is interested in collaborating with.

#### *(d) Forming interdisciplinary teams*

Maintaining the existing initiatives to fund projects in which different lines of research, laboratories and research groups are linked, but with a timetable with fixed calls that allow researchers to prepare their applications in good time (for example, make it clear that submissions will open in X and Y months).

Boosting the formation of these teams by defining project proposals that CIDTFF prioritises and that incorporate researchers who are interested in being part of the project's activity plan. In other words, have base projects outlined by the coordination team that researchers can join. Another action could be to create a "Pool of Interested Parties" for specific CIDTFF needs, in which the coordination team can promote links between researchers.

## **4.5. Framework for other proposals or initiatives in 2023-2026**

To receive other proposals for actions or processes that contribute to the development of CIDTFF researchers, a form is available in the UA forms area. Proposals must be aligned with the RDP and with the domains and respective subdomains and/or processes listed therein. All proposals will be submitted for consideration by the CIDTFF Researcher Development Group, which will analyse them according to their suitability for the RDP and their feasibility. Proposals to be included in the RDP must be sent in by 30 November each year, to be implemented the following year. The same form can be used for ad hoc proposals to be monitored by the WG.

### **4.5.1. Structure and content of the form for proposing actions under the RDP**

The structure and content of the form for proposing actions under the RDP is as follows:

Name of the proposer:

Email:

Title/theme of the proposal:

Facilitator:

Recipients:

Minimum and maximum number of participants:

Brief description of the proposal (maximum 100 words):

A brief overview of the RDP:

Domain and subdomain it belongs to:

Domain A. Training in scientific research and supervision

Domain B. Interpersonal development and well-being

Domain C. Leadership, Management and Financing

Domain D. Responsibility, impact, and sustainability

Processes to which it belongs:

A) Socialisation to build multiple and varied tacit knowledge

B) Sharing different tacit knowledge

B) Combining different explicit knowledge

D) Individual internalisation of explicit knowledge generated within the organisation

Date and time scheduled for the action/initiative:

Modality:

Presential

Online (remote)

Hybrid

Necessary resources forecast (technical and logistical equipment):

Expenditure and financing forecast:

## **5. MONITORING THE CONSTRUCTION OF THE INDIVIDUAL AND COLLECTIVE RESEARCHER'S SELF**

Important notes:

To carry out a quality monitoring and evaluation plan, it will be necessary to use means of data collection to be defined and to draw up a monitoring schedule.

The monitoring work should be articulated with the CIDTFF's "Monitoring and Evaluation for Development Group (MoADe)".

The information collected to monitor the RDP will be analysed annually.

The aspects to be regularly monitored, considering the objectives of the RDP (see section 1.3) are the ones outlined below:

### **A - Monitoring the construction of the individual researcher's "Self"**

- People's adherence and satisfaction
- Personal well-being
- Progress in each area of the individual researcher's "Self" as indicated in 4.2

### **B - Monitoring the construction of the collective researcher's "Self"**

1. Monitoring the processes of building the collective researcher's "Self" in each instance (Laboratories, Lines, Programmatic Project, CIDTFF)
  - socialisation to build multiple and varied tacit knowledge;
  - sharing different tacit knowledge;
  - combination of different explicit knowledge;
  - individual internalisation of the explicit knowledge generated within the organisation.
2. Monitoring product indicators
  - Scientific production
  - Partnerships
  - Projects
  - Networks
3. Monitoring impact indicators
  - A research focus recognisable to the academic community, the educational community and society;
  - Evaluation of impact on educational practices, educational policies, and society.

## 5.1. Monitoring the construction of the individual researcher’s “Self”

Monitoring the construction of the individual researcher’s “Self” can be done by:

- a) systematic collection and analysis of data on the degree of satisfaction and adherence to each action carried out within the scope of the CIDTFF RDP;
- b) annual collection and analysis of data on overall satisfaction with and adherence to the CIDTFF RDP;
- c) annual collection of the self-assessment of each CIDTFF member in the domains and sub-domains indicated in 4.2.

### a) Examples of systematic collection of data indicators on the degree of satisfaction and adherence to each action carried out within the framework of the CIDTFF RDP:

Criteria	Indicators
Participant adherence and satisfaction	<p>1 - Participation rate: Evaluates the number of people who have taken part in the RDP’s actions/initiatives about the total number of people eligible.</p> <p>2 - Usefulness of the plan: Obtain feedback (through means to be defined) on people’s perceptions of the usefulness of the RDP. Ask about the relevance, effectiveness, and applicability of the proposed activities.</p> <p>3 - Level of satisfaction: Ask people to rate their overall satisfaction regarding the RDP. This can be measured through rating scales, questionnaires, or interviews, where people can express their level of satisfaction on a numerical scale or provide additional comments.</p> <p>4 - Active participation: Observing the level of people’s active participation during the activities proposed in the RDP. This can include the frequency of participation in RDP actions (events).</p> <p>5 - Engagement and enthusiasm: Observe people’s level of engagement and enthusiasm for the RDP. This can be assessed through interactions, questions, suggestions, or proactive initiatives related to the professional development of researchers.</p>
Personal well-being	To be determined
Reflexivity - Rethinking my paradigms	To be determined

### b) Examples of annual data collection indicators on overall satisfaction and adherence to the RDP

Criteria	Indicators
Participant adherence and satisfaction	<p>1 - Participation rate: Evaluates the number of people who have taken part in the RDP’s actions/initiatives about the total number of people eligible.</p> <p>2 - Usefulness of the plan: Obtain feedback (through means to be defined) on people’s perceptions of the usefulness of the RDP. Ask about the relevance, effectiveness, and applicability of the proposed activities.</p> <p>3 - Level of satisfaction: Ask people to rate their overall satisfaction with the RDP. This can be measured using rating scales, questionnaires, or interviews, where people can express their level of satisfaction on a numerical scale or provide additional comments.</p> <p>4 - Active participation: Observing the level of people’s active participation during the activities proposed in the RDP. This can include the frequency of participation in RDP actions (events).</p>
Personal well-being	To be determined
Reflexivity - Rethinking my paradigms	To be determined

### c) Annual collection of the self-evaluation of each CIDTFF member in the domains and subdomains indicated in 4.2

## 5.2. Monitoring the construction of the collective researcher's "Self"

Monitoring the construction of the collective researcher's "Self" can be done as it follows:

- a) Collection and analysis of self-evaluation reports in each instance (Laboratories, Lines, Programmatic Project, CIDTFF), according to the information requested in 4.3, to monitor the processes of building the collective researcher's "Self";
- b) Annual collection and analysis of productivity indicator data;
- c) Biennial analysis based on external auditing of the impact of CIDTFF on public perception of the centres's research focus and based on an evaluation of the impact of CIDTFF's activity.

### **a) Collection of self-evaluation reports, according to the information requested in 4.3, to monitor the processes of building the collective researcher's "Self" in each instance (Labs, Lines, CIDTFF).**

Analysed according to the following:

- socialisation to build multiple and varied tacit knowledge;
- sharing different tacit knowledge;
- combination of different explicit knowledge;
- individual internalisation of the explicit knowledge generated within the organisation.

### **b) Annual data collection in order to monitor product indicators**

Analysed according to the following:

- Scientific production, according to quality of journals, number of publications;
- Partnerships according to the variety of partners and level of internationalisation;
- Projects according to funding and impact on society;
- Networks.

### **c) Biennial external auditing of impact indicators**

Analyse according to the following:

- Public perception of the research focus that is recognisable to the academic community, the educational community and society;
- Evaluation of impact on educational practices, educational policies and society.





## **ANNEXES**



## **ANNEX 1 - TEXT BASED ON THE LITERATURE FOR SECTION 3.2 [DEVELOPMENT OF THE RESEARCHER'S "SELF" (INDIVIDUAL AND COLLECTIVE)]**

### **Development of the researcher's "Self" (individual and collective)**

The construction of the researcher's "Self" is a crucial process for the development of the researcher as a person and of CIDTFF as an organisation dedicated to research, both of which have an identity to build a "Self". This process of building the researcher's "Self" (individually and collectively) is essential for the construction of new knowledge.

In this section of the RDP we propose an approach to the concepts of the individual researcher and the collective researcher, based on the conceptualisations and epistemological modelling presented by Nonaka and Takeuchi (2007) and Muger-Schächter (2006). In the approach selected, we have articulated the proposals made by these authors to integrate various contributions within the scope of a thriving and increasingly important field of study: the development of researchers. The first focuses more on how organisations create knowledge, and the second on the conditions for creating knowledge.

We, therefore, propose an understanding of the construction and development of the researcher's "Self" based on the concepts of the individual researcher's "Self" and the collective researcher's "Self" and the dynamics that are established between individual and collective knowledge and tacit and explicit knowledge.

### **1. Building the individual researcher's "Self" and the collective researcher's "Self"**

To address the dynamics that are established between the different types of knowledge and their importance in understanding the construction of the researcher's "Self", we have chosen to clarify the concepts of the individual and the collective researcher's "Selves".

#### **Building the individual researcher's "Self"**

It is the individual researcher's "Self" who experiences the effort and pleasure of choosing what to focus on and how to focus on it, what deserves attention. It's a subjective and tacit decision. It's a decision that is leveraged by one's theoretical and practical knowledge, personal and interpersonal experience, values and ideals and perception of the expectations built up about what the communities one belongs to value. In this sense, creating new knowledge is as much about ideals as it is about ideas (Nonaka & Takeuchi, 2007).

There is, therefore, an initial, individual, subjective, and tacit act that is responsible for choosing the fragment of reality (understood as the entire evolutionary repository and not just external

physical reality (Mugur-Schächter, 2006) that has captured the interest of the researcher's "Self", on which are generated certain questions to which there are no yet answers. It is a conscious and initial epistemic act that defines and delimits what to study and how to study it. This initial subjectivity is followed by "objectivisation" procedures that ensure communicability and intersubjective consensus (Mugur-Schächter, 2006). More importantly, without this subjective act of looking in a certain way at a fragment of reality, there is no object of study (Mugur-Schächter, 2006). The initial, individual, subjective, and tacit act is related to the "researcher's identity" studied in a systematic review by Castelló et al. (2021), stating that the greater the researcher's identity, the greater the diversity of possibilities for looking at the same fragment in different ways. According to (Castelló et al., 2021), the "researcher's identity" develops over time and has different characteristics in each of the main stages in which it can be found, an understanding that is reinforced by other authors (e.g. Fazal & Chakravarty, 2021). Thus, developing the "researcher's identity" is a key act in developing the quality of research, since it is the necessary condition, according to Mugur-Schächter (2006), in the epistemological proposal on the construction of knowledge, for there to be an object of study, i.e. for research to begin. Important aspects for developing the researcher's identity in the initial phases are the assessment of person-environment suitability (Davis et al., 2023) and self-reflection to gauge the implicit and explicit subjectivity in decision-making or in the assumptions made (Cruz, 2015).

The question of emotion, contingency and human factors in research, in other words, the question of tacit and subjective knowledge as inherent in the initial act of research, is the subject of epistemological research and is still open (Dekker et al., 2010), as noted in the research by Mugur-Schächter (2006) and Nonaka and Takeuchi (2007).

The "look" at a fragment of reality from a particular perspective (theoretical and teleological) gives rise to a description that becomes public and communicable (Mugur-Schächter, 2006). In the social sciences, the most important thing is that the same fragment of reality can have different perspectives and therefore different descriptions. It is this multiplicity of descriptions, each based on a particular perspective, which is explicit, that makes it possible to have a broader understanding insofar as from multiple descriptions it is possible to construct other more complete, more abstract and more complex descriptions (Mugur-Schächter, 2006).

On the other hand, the individual researcher's "Self" is the primary source of tacit knowledge. This involves direct experience with the body, is contextual (here and now) and is practical in nature (Nonaka & Toyama, 2003). It is the knowledge of knowing how to do and to be (techniques, methods, ways of thinking and speaking, approaches to actors in the field, attitudes, etc.) that does not require explicit discourse. In Nonaka and Toyama's model, it is through socialisation with other individuals in each environment that the conditions are created for individual tacit knowledge to be built up to its greatest extent (see figure 3).

### **Building the collective researcher's "Self"**

Concerning the collective researcher's "Self", and still considering Nonaka and Takeuchi's conceptualisation, the creation of collective (organisational) knowledge is defined as the capacity of an organisation/group as a whole to create new knowledge, disseminate it throughout the organisation and incorporate it into its products, services and systems.

For the authors, the creation of collective (organisational) knowledge involves considering two dimensions: the epistemological dimension and the ontological dimension. In the epistemological dimension, the authors recognise two types of knowledge, tacit and explicit, which are related and interact in the continuum of the ontological dimension. The ontological dimension, as mentioned, is organised on a continuum that extends from the individual at one end to the organisational at the other, passing through the group (which, in the case of CIDTFF, includes the Laboratories and Research Groups). In the interaction between these two types of knowledge (tacit and explicit) and between the dimensions considered, the authors explain their understanding of the conversion of individual knowledge into group and organisational knowledge, allowing for some clarification on the construction of the individual researcher's "Self" and the collective researcher's "Self" and how these are related (see section 3.2.2).

## 2. Dynamics between individual and collective knowledge and between tacit and explicit knowledge

Although Evans (2015) conceptualises the researcher’s development in three main components or elements (behavioural development, attitudinal development, and intellectual development), each of which is densified into sub-components, it would be important to combine Evans’ approach with the knowledge creation model proposed by Nonaka and Toyama (2003). This model entails the dynamics of interaction and development between tacit and explicit knowledge (see figure 3). And the combination we propose is that each component and sub-component of the Evans’ model should be considered in its tacit and explicit dimension.

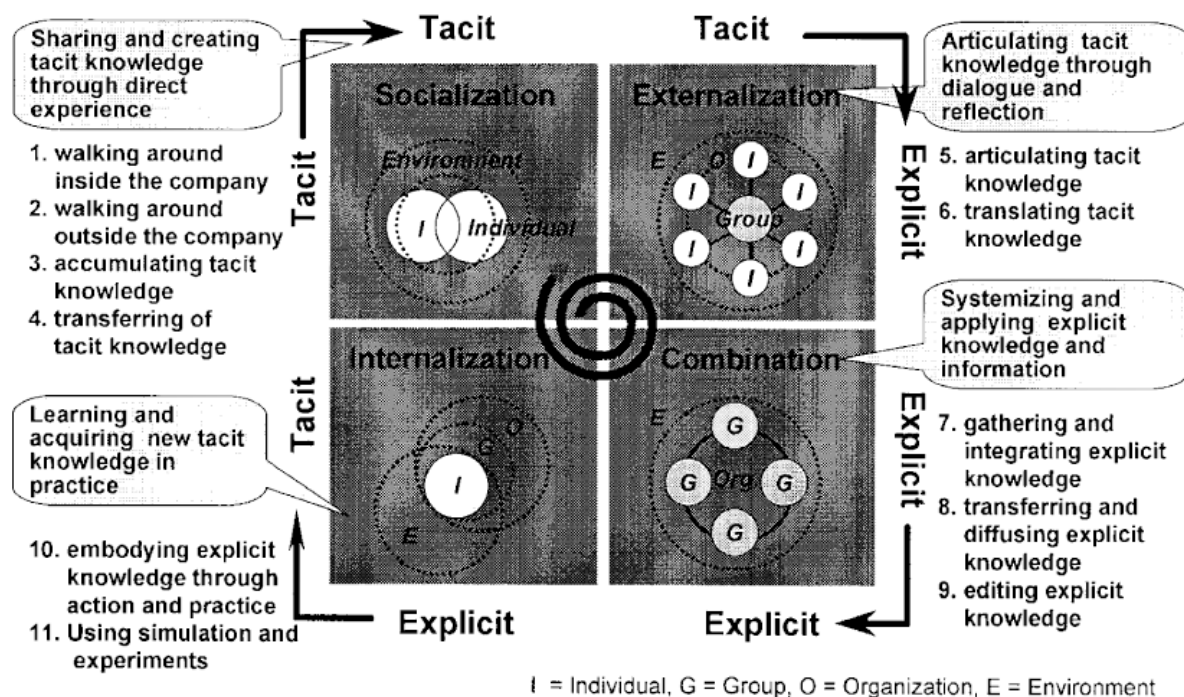


Figure 3 - Knowledge construction model of the collective researcher’s “Self” proposed by Nonaka & Toyama (2003)

Returning to Nonaka and Toyama’s model, when a researcher’s “Self” shares, articulates and reflects on tacit knowledge in the group he or she is part of, the individual becomes aware of the characteristics of the perspective that has been adopted and allows the group to build a discourse of an explicit and conceptual nature. In this environment, the conditions are created for the different tacit kinds of knowledge to be linked, and the languages used to describe them can be translated into other semiotic registers (transformations in the same type of language or even conversions of one type of language into another) and explicit knowledge is created. This explicit knowledge involves a certain rationality with recognisable and explicit mental operations and is theoretical (Nonaka & Toyama, 2003).

In the same Nonaka and Toyama model, when different groups share their knowledge within an organisation (see figure 3) there is the possibility of combining different explicit knowledge. Each group can bring together and integrate different types of knowledge, transfer it to other contexts, transform it, or make it more intelligible or more abstract. It is in this context that an organisation, as such, is creating knowledge. In other words, in this process the construction of the individual researcher’s “Self” gives rise to the construction of the collective researcher’s “Self”. To put it another way, individual identity interacts with collective identity.

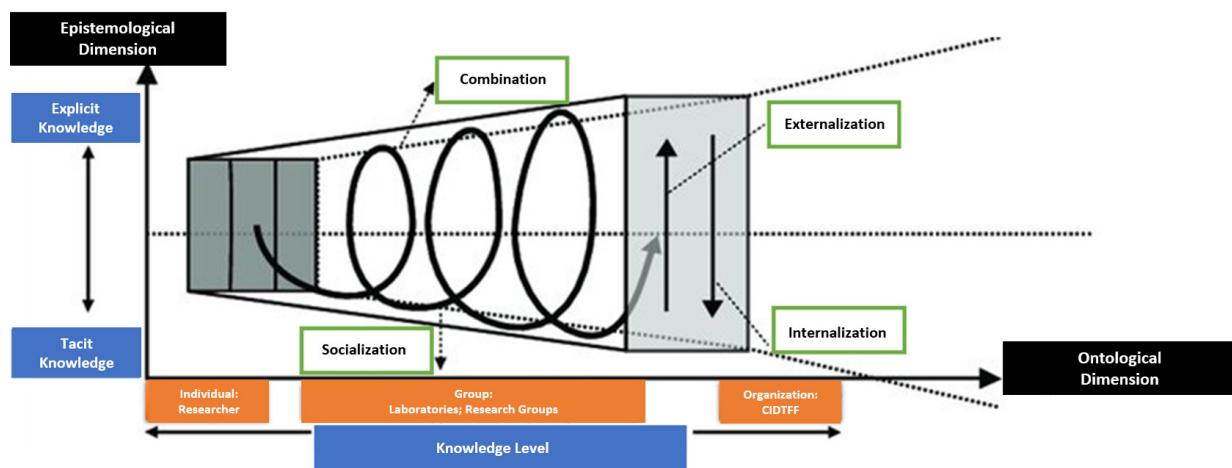
Following the model in figure 3, we see that the individual needs socialisation with other individuals to generate tacit knowledge of an individual nature. When they share it with other individuals, in a properly orchestrated process of externalisation, knowledge of an explicit nature can

be generated. If knowledge from different groups is shared within the context of an organisation (e.g. CIDTFF), a combination of conceptual knowledge can take place, giving rise to more intelligible, more abstract, and more transferable knowledge. For this virtuous cycle to feed itself, there must be a process of internalisation, which is essentially an individual process. The existence of a framework for everyone to monitor his or her development as a researcher and as a person is recognised as fundamental in any researcher’s development plan (Bray & Boon, 2011).

It is through the internalisation (see figure 4) of more explicit knowledge, incorporating it into action and practice or through experimentation or simulation, that it is possible to increase the repertoire of individual tacit knowledge (Nonaka & Toyama, 2003). This internalisation supports and gives personal meaning to explicit knowledge. This tacit knowledge can be gauged in a context of socialisation, i.e. in a context of seeing and feeling what others do, and so the cycle begins again. Adopting the Nonaka and Toyama’s (2003) model for the creation of individual and collective knowledge, the internalisation of explicit knowledge is an important process for the development of the researcher’s “Self” (in individual and collective terms). The school of thought that combines development with reflexivity (e.g. Attia & Edge, 2017) fits very well with this phase of the knowledge creation model proposed by Nonaka and Toyama (2003), although reflexivity can also be important in the other steps of the knowledge growth model.

Figure 4, based on the work carried out by Nonaka and Takeuchi (1995), shows a spiral of creation of organisational knowledge adapted to CIDTFF. For them, the construction of organisational knowledge can be explained by considering the epistemological and ontological dimensions and the interaction between tacit and explicit knowledge.

Building organisational knowledge involves considering the epistemological and ontological dimensions and the interactions that take place between tacit and explicit knowledge along the continuum of the ontological dimension. The interaction of these two types of knowledge forms a spiral that rises dynamically from a lower to a higher ontological level. This spiral is created by the four modes of knowledge conversion, through which each type of knowledge is converted into another. These modes of knowledge conversion (see also Figure 3), which are explicit in the two schemes presented, are: socialisation (tacit to tacit, involving more individuals and groups), externalisation (tacit to explicit, involving more individuals and groups), combination (explicit to explicit, involving more groups) and internalisation (explicit to tacit, with the individual once again taking precedence).



**Figure 4** - Organisational knowledge building spiral proposed by Nonaka & Takeuchi (1995) adapted to the context of CIDTFF - collective researcher’s “Self”.

In summary, Nonaka and Takeuchi propose (see Figure 4) a theory to explain the phenomenon of building organisational knowledge. For the authors, the construction of organisational knowledge can be defined as the capacity of an organisation/group to create new knowledge, disseminate it throughout the organisation and incorporate it into its products, services and systems. Initially, knowledge is built individually and subsequently becomes organisational knowledge. In



the epistemological dimension, the authors recognise two types of knowledge: tacit knowledge (which emerges from the experience of the individual and the organisation) and explicit knowledge (which can be written down and transferred in a relatively simple way). The ontological dimension is organised on a continuum that goes from the individual, at one end, to the most sophisticated organisational level, passing through intermediate organisational levels (e.g. team, group).

### **3. Implications of the dynamics between individuals and collective knowledge and between tacit and explicit knowledge for a *researcher development plan***

We can see that tacit and experiential knowledge is what drives conceptual and explicit knowledge, which can be shared and reconstructed within a group and then within an organisation. However, explicit knowledge makes it possible to extend the possibilities of tacit knowledge, increasing the quality and diversity of what you can and know how to do. There is thus a symbiosis between the individual, the group, and the organisation, which needs to be understood, structured and nurtured.

In these dynamics of knowledge construction, the researcher's "Self" is always present, either in the form of individuals, groups, or organisations. Tacit knowledge can also be found in individuals, groups, or organisations. However, the primary source of tacit knowledge is the individual and the primary source of explicit knowledge is the collective.

It follows from the conceptualisation presented in this section that the most important steps that need to be taken to build the researcher's "Self" (in individual and collective terms) are:

- **The individual researcher's "Self" has to:** (a) construct and develop his/her identity as a researcher; (b) assume his or her subjectivity in the choices he or she makes and in the assumptions he or she implicitly or explicitly admits (e.g. choice of the fragment of reality that excites me, theoretical perspective I adopt); (c) become aware of what he or she knows and doesn't know how to do; (d) adopt effective processes for internalising the explicit knowledge available.
- **The collective researcher's "Self" must organise the processes of:** (a) socialisation to build multiple and varied tacit knowledge; (b) sharing different tacit knowledge; (c) combining different explicit knowledge; (d) individual internalisation of the explicit knowledge generated within the organisation.

The organisational processes of institutions are also important for developing the individual researcher's "Self". Mazmanian et al. (2014), in a systematic review study, showed that an institution's intervention, through actions in the field of researcher development, is effective in improving researcher behaviour. These improvements occur in changes in performance, including the number of publications or grant applications, and some of the reviewed studies report changes in competence, including writing, presentation or analytical skills, and performance in research practice.

### **4. Building the researcher's identity: recognising subjectivity as a starting point for setting the epistemic actor in motion**

The subjectivity of the research process and the construction of knowledge is recognised in the literature by various authors. Being a researcher implies recognising and taking on board this subjective (individual) dimension and how this subjectivity can affect the researcher's relationship with the object under study, with the construction of knowledge and with the context in which he or she is inserted. The construction of knowledge is a process based on reality seen from a particular perspective - that of the researcher. The same reality can be seen in different ways, depending on the angle considered ("every point of view is the view from a point" - subjectivity).

In the process of constructing knowledge, the researcher is not free from his or her own context(s). Social, cultural, and historical contexts are important to people because they give them

the basis (the references) for interpreting information and creating meanings (Nonaka & Toyama, 2003), they are their frames of reference.

The concept of subjectivity is not new, especially in the context of qualitative research. Various understandings of this concept can be found in the literature. For example, Cruz (2015) distinguishes between two types of subjectivity: explicit subjectivity and implicit subjectivity. For the author, **explicit subjectivity** is a type of subjectivity that researchers are more aware of and recognise as such from the outset. This dimension of subjectivity is present in the explicit decisions regarding the research design, i.e. decisions concerning the ontological, epistemological, and methodological dimensions of the research (Crotty, 2003).

The **implicit dimension of** the researcher's subjectivity is not always recognised and can even be denied. During the research process, and especially during the empirical study, some aspects of "hidden" (tacit) subjectivity can begin to emerge. When researchers begin to question their preconceptions (whether positive or negative), they can begin to make explicit what is "hidden" (implicit assumptions begin to appear) in their frames of reference (e.g. theoretical, symbolic).

This self-reflexive process of questioning and confronting the researcher's frames of reference with the object under study and the context in which it is inserted allows the implicit dimensions of subjectivity to emerge (in addition to the explicit ones, which are conscious to the researcher) and highlights the importance of reflexivity as an instrument at the service of the construction of the epistemic "Self".

### **Reflexivity in research: an instrument for raising awareness of subjectivity (being aware of subjectivity as a researcher)**

Each researcher has their own frames of reference (theoretical, symbolic, etc.) that determine how they "see" the object under study and how they relate to others and their context (reality). Individual observation is not neutral, it is an active interaction between the researcher and reality (determined by the researcher's perspectives). This interaction is a dynamic process between the subject and the object, the subject, and others, so the subject's (researcher's) frame of reference is neither static nor determined; it is constantly being (re)constructed (Cruz, 2015). "Research supports and underpins not only the production of knowledge, but also the production of the "Self" (of being a person) (Sá-Chaves, 2013, p. 25).

In recognising and defining this (explicit) subjectivity, the identification of the onto-epistemological principles (conceptions about the nature of the object under study, and about science and scientific knowledge) and methodological principles (related to the way scientific knowledge is constructed) is essential to begin the researcher's reflective experience and the construction of an identity.

Perhaps the first challenge for reflexivity is to recognise, debate and justify the ontological, epistemological, and methodological conceptions of the researcher (explicit subjectivity). "It is the ontological limits of being in the world that will determine the epistemological and methodological options for building knowledge that is both multi-referential and personal because, although situated, it emerges through the personal interpretation of each researcher" (Sá-Chaves, 2013, p. 25).

But we need to go further and recognise the implicit dimension of the decisions made as researchers and make them explicit.

### **Subjectivity: how to make implicit assumptions explicit?**

There are different ways of expressing self-reflexivity during the process: self-reflective diaries or records, autobiographical sketches, for example. Cruz (2015) highlights two relevant types:

*Epistemological model of reflection* (Raeithel, 1998). According to this model, the researcher assumes the position of observer of his or her own actions and interactions with the object under study, in a given context. This model is organised into 3 phases: i) basic centralisation (as epistemic subjects we establish an interaction with the object of study, but without being aware of the structure of this interaction); ii) decentralisation (implies researchers distancing themselves from their

own patterns of action) and; iii) recentralisation (dialogue with themselves and others; researchers reflect on, transform or reinvent the parts of the social system that determine their perspective on the problem).

*Reflective observation* (Ríos Saavedra, 2005). An approach based on Alfred Schutz's concept of phenomenological attitude and Edmund Husserl's phenomenological theory. This attitude of reflective observation implies removing the researcher's symbolic and theoretical frameworks, suspending the researcher's judgements, making aspects that were certain and evident debatable. This attitude of an observer is reflexive and presupposes a distancing from the researcher, a distance, albeit within proximity. Cruz warns that this perspective is not easy to accept and has been highly controversial. Le Vasseur (2003) emphasises that reflective observation implies that previous knowledge can be suspended and set aside so that the researcher can form new impressions about the phenomenon without interference from previous theoretical frameworks. Is it possible to suppress the researcher's theoretical framework? Is it possible to erase the researcher's symbolic framework and access the meanings of the phenomenon in a purer way?

From another perspective, other authors are not so critical and consider that this distancing is not the elimination of preconceived notions, but rather a temporary suspension of previous beliefs so that other questions and perspectives can emerge (Boyde, 1989).

## **5. Reflexivity and self-regulation as working tools for building the researcher's "Self"**

Competences related to self-management and self-regulation of learning in a professional context are crucial, as they involve cycles of processes that allow the individual to adapt responsively to achieve success in each situation (Cuyvers, Van den Bossche & Donche, 2020). Self-regulation of professional learning implies responsibility, the adoption of metacognitive strategies and the active involvement of professionals in planning, managing, monitoring, and raising awareness of their needs (Sitzmann and Ely 2011; Cuyvers, Van den Bossche & Donche, 2020). From a professional learning perspective, reflection is essential for individuals to become aware of their biases, analyse problems and enable them to transform their daily work practices (Tynjälä 2013).

An academic career requires the involvement of research, teaching and administrative work processes that require the management of various tasks, experiences, and behaviours over time or at specific stages of a career (Zacher, Rudolph, Todorovic & Ammann, 2019).

Moreno Bayardo (2005) proposes that a researcher's profile should focus on seven groups of essential research competences, namely: 1) Perception; 2) Instrumental abilities; 3) Thinking skills; 4) Conceptual construction; 5) Methodological construction; 6) Social construction of knowledge, and 7) Metacognitive competences. In particular, metacognitive competences are based on: the definition of objectives in relation to personal involvement with the object of knowledge; the self-regulation of cognitive processes during the production of knowledge; reflective questioning about the importance of intentional actions for the production of knowledge; and the evaluation of research approaches; and finally, the self-assessment of the results produced (ibid.). These competences are associated with the activities of controlling and evaluating knowledge and what is produced in research. Metacognition is based on awareness of one's own reflection on one's actions, self-regulation of processes and products while producing knowledge.

In the UK's *Researcher Development Framework* (RDF) (Vitae, 2011), we found that in domain B "Personal Effectiveness", centred on self-management skills, especially in the sub-domain B1 "Personal Qualities", self-reflection is considered a personal quality. It requires the researcher to reflect on their practice and experience, to be aware of the positive aspects and aspects to be improved, to seek and learn from feedback on their performance, to learn from mistakes, and to look for ways to improve their performance.

Reflexivity involves a continuous process of reciprocal training between the researcher and the research. This process makes it possible to enrich the experience through an awareness of the phenomena and processes of interaction between the researcher and the context. Researchers deepen their understanding of the experience and become capable of building a coherent and

harmonious research practice (Attia & Edge, 2017). The continuous construction of this congruent practice requires a balance between professional principles and professional behaviour, an openness to new ways of being and knowing, values and competences (ibid.).

Olmos-Vega et al. (2023) consider reflexivity to be a set of continuous, multifaceted, and collaborative practices in which researchers consciously analyse and evaluate the influence of their subjectivity and context on research processes.

Reflexivity can be characterised from two perspectives (Edge, 2011; Attia & Edge, 2017) as follows: Prospective reflexivity: concerns itself on the effect of the whole-person-researcher on the research. It aims to help the researcher increase their ability to understand the meanings of the knowledge, values and feelings they have brought to the context of the research questions, the methodological processes and the results.

Retrospective reflexivity: concerns itself with the effect of the research on the researcher (intrinsic development).

According to Mann (2016), reflexivity is bidirectional and mutually formed with the context, focusing on the “Self” and intersubjectivity and interactions with the context. Thus, reflexivity integrates human development and the cycles of retrospective and prospective reflexivity allow for a conscious “whole-person development of the researcher” (Attia & Edge, 2017). It is seen as a way of valuing the subjectivity of researchers (Olmos-Vega et al., 2023).

## **ANNEX 2 - QUESTIONNAIRE TO ASSESS THE INTERESTS AND NEEDS OF CIDTFF RESEARCHERS FOR THEIR RDP**

### **Introductory section**

- Introductory text (scope and objectives of the questionnaire)
- GDPR
- E-mail for questions
- Acknowledgements

### **Section I - Characterisation of the participant**

#### **1) Age (*dropdown list mode*)**

Options: <30 | 31-40 | 41-50 | 51-60 | 61-70 | >70

#### **2) Category (*dropdown list mode*)**

Options: PhD integrated member | Non-doctoral integrated member | Collaborator | Secretariat or scholarship holder | Other (please specify)

#### **3) CIDTFF laboratory you belong to (*dropdown list mode*)**

Options: List the various laboratories

#### **4) CIDTFF group you belong to (*dropdown list mode*)**

Options: List the 3 research groups

### **Section II - Identification of needs or suggestions for actions/initiatives by CIDTFF researchers for the RDP**

#### **A - Actions and Processes of the RDP**

- 1) Indicate, in order of relevance, the actions or processes in the CIDTFF Researcher Development Plan that you consider to be a priority for implementation, justifying the need for them:
- 2) Indicate, in order of relevance, what other types of actions or processes you believe are essential to be included in the CIDTFF Researcher Development Plan, in addition to those already included in the RDP, justifying their necessity:
- 3) Indicate, in order of interest, which actions or processes you would like to attend:

## **B - Typology**

4) Indicate the preferred typology for attending RDP actions or processes (*drop down list mode*)

Options: Hybrid | Online | Presential | Other

## **C - Duration**

5) Indicate the preferred duration for attending RDP actions or processes (*drop down list mode*)

Options: 1h| one morning | one afternoon | intensive (> 25 hours) | Depends on actions / processes

## **D - Timetable**

Indicate the preferred time/period to attend RDP actions or processes (*dropdown list mode*)

Options: morning | afternoon | evening

## **E - Suggestions of personalities/trainers/researchers and their themes:**

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Financially supported by National Funds through FCT – Fundação para a Ciência e a Tecnologia, I.P.,  
under the projects UIDB/00194/2020 (<https://doi.org/10.54499/UIDB/00194/2020>)  
and UIDP/00194/2020 (<https://doi.org/10.54499/UIDP/00194/2020>)

