Cluster 4: Achieving alignment via sharing of research knowledge, data and infrastructure

Understanding sharing of research knowledge, data and infrastructure

Alignment can be achieved via **capacity and community building amongst researchers**, and by providing them with the necessary infrastructural and technical resources to conduct transnational research. This requires sharing research knowledge, data and infrastructure across borders through specific joint actions including:

- **Networks of researchers** on a specific research issue (thematic and/or methodological): they facilitate (i) exchange, coordination and harmonisation of good practices, research methodologies and techniques, (ii) exchange of knowledge and data, and (iii) exchange of ideas for future transnational research *(cf. Current Approaches to Alignment, Case Study No. 1, FACCE JPI's Knowledge Hub MACSUR)*;

- **Sharing/joint use of research infrastructure**: instrumentation platforms and research equipment can be made available at transnational level thanks to the sharing or joint use of existing national or transnational research infrastructure or thanks to the establishment of a new transnational research infrastructure *(cf. Current Approaches to Alignment, Case Study No. 5, JPI Oceans' Shared Research Vessel)*;

- **Transnational technical "virtual" infrastructure** (data sharing/open access platforms): they facilitate (i) dissemination, exchange and re-use of research data, publications, developed software and other research outputs, and (ii) joint training, dissemination of good practices, research methodologies and techniques (e.g. online) *(cf. Current Approaches to Alignment, Case Study No. 7, The Open Access Infrastructure for Research in Europe – OpenAIRE)*.

This summary pertains to 3 case studies of the ERALEARN2020 project: (1) FACCE JPI's Knowledge Hub MACSUR; (2) JPI Oceans' Shared Research Vessel; and (3) the Open Access Infrastructure for Research in Europe (OpenAIRE).

Overall Strengths

- **Enhanced transnational collaboration and community-building amongst researchers:** Thanks to the sharing of existing knowledge, achieved outcomes and data, the above-mentioned infrastructures and networks of researchers contribute to avoiding fragmentation while increasing alignment and efficiency of research activities across Europe. They give the opportunity to discuss emerging research ideas and needs amongst researchers through a bottom-up approach (e.g. through networking) and to jointly conduct new research (e.g. through the joint use of research infrastructure). In addition, Open Access (OA) infrastructures can contribute to aligning future national research agendas, particularly if research outputs that are available in open access are analysed in order to feed into research policy making.

- **Increased exchange, coordination and harmonisation of research methodologies and techniques:** This is especially true when collectively designing and applying protocols (e.g. when jointly using research infrastructure), but also through joint training, dissemination of guidelines and informal networking. It allows to enhance interoperability of research outputs and alignment of research methodologies, as such increasing the quality, transparency and efficiency of research. Sharing best practices and cutting-edge infrastructure and equipment is especially of high value for less research-intensive countries.

- **Pooling of national resources including human resources, facilities, equipment and outputs:** Research infrastructures and networks of researchers build significant critical mass while relying on a cost-effective approach through economies of scale (e.g. joint training or sharing of existing infrastructure) and the distribution of costs across countries. They also have a leverage-effect on new transnational research.

- **Higher impact of researchers and their outcomes through joint inputs towards societal challenges:** Thanks to the development of a common understanding of priority issues amongst researchers and the coordination of national research activities and outputs, researchers can provide joint inputs and recommendations that have a stronger potential for impact on policy making, for uptake by end-users (and as such return on investment), and for impact on future transnational research strategies. In addition, these European infrastructures and networks of researchers have an increased visibility on the international scene, enhancing international collaboration and impact on global political agendas.

- **Enhanced national as well as inter- and intra-institutional coordination:** This is required in order to set up a transnational infrastructure/network. It applies to thematic and as well as operational research issues (e.g. cross-border sharing of infrastructure, open access to national research outputs).

Overall Challenges

- **Design an adapted transnational funding model:** The adopted funding model should adequately distribute costs and related tasks among partners: funding limitations, including low national in-cash and in-kind contributions, greatly impact the operation of infrastructures and networks of researchers. For instance, relying on a variable geometry and a virtual common pot does not necessarily engage partners to commit significantly and provide financial sustainability.

- **Balance a bottom-up approach with a top-down overall guidance and coordination:** This challenge refers to the need to ensure flexibility and community-building at researchers' level, and at the same time to develop a clear overall vision and strategy supported by efficient decision-making procedures. In particular, the bottom-up approach is not sufficient in order to continuously and efficiently adapt infrastructures and networks to researchers' new needs and opportunities as a whole.

- **Adequately prepare the set-up and operation of transnational networks of researchers and infrastructures:** For instance, this can mean putting in place a competitive bidding system and joint peer review to select users of the infrastructure/network, implementing an effective communication strategy in order to raise awareness on the existence and benefits of an infrastructure/network, setting up a common management structure, etc. This also refers to the need to harmonise related national rules regarding the funding of the operation of the infrastructure/network, eligibility criteria for the selection of researchers, reporting requirements, etc.

- **Coordinate all relevant researchers and other key players:** This allows to provide relevant outcomes through day-to-day activities facilitated by infrastructures and networks, as well as to support the latter in the long term and ensure the impact of related outcomes.

Key factors of success

1) At strategic level:

- **Delineate the scope** (thematic and/or transversal issue) and objectives of the infrastructure/network: this impacts the latter's membership, governance, operation and activities. In addition, regularly revising objectives allows to adapt the infrastructure/network to emerging research needs and opportunities.
- **Design a balanced governance model**: a top-down definition of a research strategy should take account of the desire for ownership of scientists/key players and the need for flexibility at their level.

2) At financial level:

- **Design a sustainable funding model adapted to a transnational approach**, particularly for: 1) the operation of the network/infrastructure, and 2) the implementation of activities (e.g. joint training, new research activities, etc.). This requires sustainable in-cash and in-kind contributions at national level.

3) At operational level:

- **Adopt joint rules for the set-up of the infrastructure/network** (e.g. centralised management structure, peer-review selection of researchers using the infrastructure/participating in the network, etc.)
- **Establish a support team that ensures an optimal use of an infrastructure or participation in a network**, by implementing related activities (e.g. for a network: organisation of joint trainings; for an OA infrastructure: support for alignment of national OA policies) and attracting and coordinating key players
- **Develop a communication strategy** to raise awareness and attract relevant scientists/key players
- **Develop a dissemination strategy** for optimal uptake of joint contributions

Pre-conditions:

- Initial **national coordination** (on scientific and operational issues and across ministries, RFOs, RPOs)
- Initial **interoperability and flexibility of national rules** (e.g. funding, management, reporting)
- **Already existing alignment at strategic level**: strong support from ministries/RFOs/RPOs/EC is required, particularly through an overall political strategy or visible strategic platform (e.g. JPI) as well as policies for effective support and impact (e.g. policies for OA, sharing infrastructure, mobility of researchers, etc.).