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SHAPE-ID: Shaping Interdisciplinary Practices in Europe

Deliverable 3.3 – Recommendations and Measures to Maximise IDR Impact on Society

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Executive summary

Between December 2019 and October 2020, SHAPE-ID organised a series of six learning case workshops to consult expert stakeholders on improving pathways to interdisciplinary and transdisciplinary research (IDR/TDR) incorporating the Arts, Humanities and Social Sciences (AHSS) in the context of addressing societal challenges. Some workshops (Dublin, Zurich) focused on broader questions around obstacles, enablers and processes of integration, while others addressed specific research challenges: how funding programmes could better involve Environmental Humanities perspectives in topics addressing environmental challenges (Edinburgh); how to enable Education for Urban Sustainability (Turin); how to reduce barriers to cooperation between Digital Humanities research and Cultural Heritage Institutions (Warsaw); and how to develop Artificial Intelligence (AI) for Social Good (Bilbao). The first three workshops were held in person, with the remaining three held online due to COVID-19 travel restrictions.

A comprehensive report of the workshop series has been produced as project deliverable D3.2 (Galvini et al., 2020). The current report aims to identify the full set of recommendations and practical measures emerging from the workshops to maximise the impact of IDR/TDR integrating AHSS on society. This is complemented by a Policy Brief (Wallace et al., 2021), which distils key recommendations for policymakers on maximising AHSS integration in IDR/TDR to provide effective responses to societal challenges.

To organise recommendations emerging from the full workshop series, the current report develops a conceptual model using seven categories outlined by in a recent Joint Research Council report as essential to understanding our political nature: misperception and disinformation; collective intelligence; emotions; value and identity; framing, metaphor and narrative; trust and openness; and evidence-informed policy (Mair et al., 2019). The model, presented in Section 3, was considered as a helpful way of outlining a pathway to impact that accounts for the role of IDR/TDR with AHSS integration and has been used as a way of organising our workshop findings in Section 4.

A first set of recommendations is broader in scope, highlighting the value of the AHSS to better contextualise science advice to policy – the so called “applied humanities” – delivering context-sensitive research, reflectivity and a longer term view of problems and factors, the capacity to widen the scope of research and innovation to include broader societal and human-centric perspectives, and the

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contribution to strategic foresight informed by the greater capacity of the AHSS to understand the full complexity of the present context.

These recommendations are supported by examples of possible mission-driven IDR/TDR integrating AHSS to address societal challenges, such as climate change, ageing and the social impact and regulation of digital technologies.

Other recommendations are more focused on specific categories, highlighting: the capacity of the AHSS to redefine research problems to centralise the human dimension – e.g. the importance of narrative to support climate change research and policy missions; the need to take emotions, ethics and societal and individual values into account – e.g. in designing technology, or in policymaking for an ageing society; the role of artists, artist-led techniques and tools for sentiment analysis to discover and handle the impact of emotions; the role of applied humanities research to address the problems of misinformation, disinformation and the crisis of democracy; and last but not least, the capacity of well-structured IDR/TDR integrating the AHSS to cultivate the ground for collective intelligence, within and outside academia, supporting dialogue among disciplines, higher education institutions and the wider civil society, triggering teams and networks to co-create solutions for joint missions.

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1 Introduction

1.1 Scope and objective

The objective of this report is to identify the most important recommendations and practical measures emerging from the SHAPE-ID learning case workshops to maximise the societal impact of interdisciplinary research (IDR) and transdisciplinary research (TDR) integrating AHSS. To aid in this process, we introduce a conceptual model to frame the question of which societal impact interdisciplinary research (IDR) and transdisciplinary research (TDR) projects integrating Arts, Humanities and Social Sciences (AHSS) perspectives may deliver compared to mono-disciplinary research approaches.

This project deliverable follows on from an extensive report on the SHAPE-ID learning case workshops (Galvini et al., 2020) and highlights those outcomes of the workshops' discussions more specifically related to achieving impact on society, delivering recommendations about why and how IDR/TDR integrating AHSS can provide more effective responses to grand societal challenges compared to purely STEM-based research addressing the same problems.

1.2 SHAPE-ID learning case workshops

The SHAPE-ID learning case workshops were designed to bring together experts on inter- and transdisciplinarity from different backgrounds to co-produce recommendations on best practice in conducting and supporting IDR/TDR in the context of societal challenges, with a specific focus on the integration of the AHSS disciplines.

Participants were drawn from a wide range of disciplinary backgrounds and sectors and included AHSS and Sciences, Technology, Engineering, Mathematics and Medicine (STEMM) researchers with experience working on IDR/TDR projects, policymakers, funders, representatives of Research Performing Organisations and from industry, civil society and the cultural sector. Workshops were organised by SHAPE-ID partners (in collaboration with local co-organisers in some cases) across Europe – Dublin, Edinburgh, Turin, Bilbao, Warsaw and Zurich – to enable the integration of perspectives from different regions.

The workshop series was developed at a Co-Design Workshop in Rome in June 2019, where partners defined a common approach and agreed the themes and schedule for each workshop (Table 1). The challenge-oriented focus of each workshop was agreed in consultation with all partners and with input from emerging findings from the literature review. In particular, efforts were made to address the

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significant underrepresentation of the Arts and Humanities in IDR/TDR to better understand the challenges of AHSS integration.

Each workshop was designed as a learning journey, commencing with presentations of case studies, vignettes or examples of successful (and unsuccessful) projects, followed by group discussions around key challenges and questions related to the workshop topic, and concluding with a forward-looking session in which participants engaged in activities to co-design missions and recommendations. This approach was intended to bring participants on a journey that deepened their understanding of other perspectives and from there enabled them to collaboratively explore pathways to change. Within this common framework partners organising workshops developed individual programmes, selecting the most appropriate methods for each activity.

Workshops were organised according to the following schedule and topics:

Workshop	Date	Location	Organisers*	Challenge-oriented focus
1	2-3 Dec 2019	Dublin	Trinity College Dublin	Positioning the Arts and Humanities to lead research addressing societal challenges
2	20-21 Jan 2020	Edinburgh	University of Edinburgh	Bringing an Environmental Humanities lens to bear on interdisciplinary collaboration among AHSS and between AHSS and STEM
3	17-18 Feb 2020	Turin	ISINNOVA (Politecnico di Torino)	Inter/Transdisciplinary educational models and approaches that support sustainable urban transformation
4**	10-11 Sept 2020	Zurich (online)	ETH Zurich (td-net)	Intersections or reconfigurations? Arts and Humanities integration in inter- and transdisciplinary research
5**	23-24 Sept 2020	Warsaw (online)	IBL PAN	Streamlining Digital Humanities research and infrastructure in the cultural heritage domain
6**	19 Oct 2020	Bilbao (online)	ISINNOVA (University of Deusto)	Artificial Intelligence (AI) challenges and scenarios of collaborative learning, working and living with machines (co- robotics)
*external collaborator in parenthesis			**initially scheduled for Mar-May 2020 in person; redesigned as virtual workshops	

Table 1 Workshops overview

- Workshop 1 (Dublin) addressed the overarching question of how the Arts and Humanities can play a greater role, as leaders or equal partners, in research focused on societal challenges (mission-oriented research, research informed by the United Nations (UN) Sustainable Development Goals (SDGs) or other socially relevant research challenges).

- Workshop 2 (Edinburgh) took up the challenge of integrating the Environmental Humanities into research addressing the significant environmental challenges facing the world today, focusing on the design and evaluation of funding calls.

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- **Workshop 3** (Turin) addressed the challenge of education for sustainable urban transitions, in collaboration with the TrUST network based at Politecnico di Torino.[1]
- **Workshop 4** (Zurich/online) focused on the challenges of including the Arts and Humanities (AH) in a more meaningful way in inter- and transdisciplinary research and funding initiatives, in collaboration with the Swiss Network for Transdisciplinary Research (td-net, Swiss Academies of Arts and Sciences).[2]
- **Workshop 5** (Warsaw/online) addressed streamlining inter- and transdisciplinary cooperation between digital humanities researchers and the cultural heritage sector.
- **Workshop 6** (Bilbao/online) explored the potential of better AHSS integration for societal challenges associated with Artificial Intelligence (AI) development, to ensure AI for societal good, in collaboration with the University of Deusto in Bilbao.

2 Background and Context

2.1 Arts, Humanities and Social Sciences Integration in Inter- and Transdisciplinary Research for Societal Impact

As stated in the background paper prepared for the first workshop in Dublin,[3] a multitude of reports and recommendations over the years have highlighted the value and necessity of including perspectives from the Arts, Humanities and Social Sciences in a more meaningful way in research and innovation policy and funding initiatives. More often than not calls for interdisciplinary integration are driven by a conviction that publicly funded research needs to address and be seen to address significant issues of societal interest – "Grand Challenges" – and that such complex challenges require understanding and expertise drawn from those disciplines that study individuals and societies, and not only those that pursue scientific and technological knowledge and solutions. As the authors of the Vilnius Declaration argued on the cusp of Horizon 2020, innovation is "driven not only by technological advances but also by societal expectations, values and demands" (Nowotny et al., 2013). European Commission (EC)

[1] TrUST: Transdisciplinarity for Urban Sustainability Transition is a research project coordinated by Dr Giulia Sonetti that aims at better understanding how to achieve more efficient and effective inter/trans-disciplinary research and education for an urban sustainability transition. It received funding from the Interuniversity Department of Regional & Urban Studies and Planning - Excellence Award at Politecnico di Torino, and the support of more than 70 institutions and organisations working on SDGs implementation.

[2] http://www.transdisciplinarity.ch/en/td-net/Ueber-td-net.html

[3] See Appendix A in Sessa & Galvini, 2019, which Section 2.1 of the current document reproduces in part

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publications and independent reports from the League of European Research Universities (LERU), the European Federation of Academies of Sciences and Humanities (ALLEA) and many others have continued to insist on the importance of this principle, but its implementation has remained a challenge. This is no surprise given the significant investment of time, money and infrastructure needed to reshape institutional cultures to overcome long-established disciplinary structures.

There has been significant effort to integrate the AHSS (usually referred to as SSH (Social Sciences and Humanities), in the European context) into the Societal Challenges and Industrial Leadership Pillars of Horizon 2020, with the EC identifying funding topics across a range of work programmes – from health and food to energy, Information and Communications Technology (ICT) and security – where a contribution from these disciplines is encouraged. They have also carefully monitored the projects funded under these calls in a series of SSH Monitoring Reports. The two most recent reports (Kania, Lemaire & Swinden, 2019; Kania & Buksch, 2020) show that the share of the overall annual budget going to SSH partners went from 7% in 2016 to 8.5% in 2017 and 8% in 2018. For topics flagged for SSH the share of programme budget went from 20% to 23% then 22% for this period. Integration remains heavily weighted towards the Social Sciences, particularly Economics, Business and Marketing, Political Science, Public Administration and Law, with very little representation from the Arts and Humanities.

ALLEA (2019) have argued that this lack of wider participation from AHSS disciplines is connected to a technocratic and instrumental attitude towards societal challenges on the part of the Commission, with "Horizon 2020 calls containing off-putting language and inadequate understanding of the issues faced" inhibiting greater involvement from AHSS researchers. As Pedersen (2016, p.3) has succinctly observed, this reflects the "politics of interdisciplinarity":

> … funding for interdisciplinary research is rarely concerned with citizens' deep-seated preconditions for behavior (sense-making, interaction, or culturally embedded values or attitudes) and more concerned with incentives, policy design, institutional solutions and so on. The research called for in funding programs, such as Horizon 2020, tend[s] to presume a problem-solving model of research over more theoretically oriented and reflexive approaches to human agency, culture and history.

These same limits remain worryingly evident in preparation for the Horizon Europe Missions. While the Commission's LAB-FAB-APP Report (Lamy et al., 2017) committed in 2017 to full integration of the SSH in Missions, including missions initiated and led by SSH researchers, LERU's response (LERU, 2017) highlighted the near total absence of the word "humanities" in the report and the relatively peripheral role the SSH were imagined to play in the pursuit of innovation in Europe. In the five Mission areas

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selected by the Commission for Horizon Europe (European Commission, 2019), and in particular in the list of disciplines encouraged in the call for experts for the Mission Boards that lead the design of the Missions, the Arts and Humanities remain notably absent. Furthermore, the notion of innovation common in policy narratives tends to emphasise economic over societal innovation, which creates problems for the meaningful participation of AHSS researchers (Koenig, 2019).

2.2 Informing Policy: The Role of the Arts, Humanities and Social Sciences

However, there are also recent signs that point to a new, more favourable direction. In the following, we briefly discuss the concepts of "institutionalizing the applied humanities" (Brom, 2019) and "understanding our political nature" (Mair et al., 2019), as they are – together with the concept of integrating AHSS in IDR/TDR discussed in Section 2.1 – the main pillars on which the conceptual model to frame the question of impact we propose in Section 3 below is based.

2.2.1 Institutionalising applied humanities

According to Brom (2019):

> One way of creating societal value is involving humanities scholars in interdisciplinary research that supports societies in developing collective action in public policy aimed at dealing with societal issues. In practice, however, we see that there is a limited interaction between interdisciplinary research in policy advice and the humanities. In practice science-based policy advice is dominated by the natural and life-sciences, sometimes supplemented with social sciences. (p.2)

Brom further notes, however, that the inherent uncertainty of science means that "discussion is always possible on every 'trustworthy and uncontroversial' evidence base" (p.3). In this sense, one important role social sciences and humanities can play is:

> … bringing translation and its socio-cultural dimensions as an explicit element into the development of science advice. More specifically, the humanities might foster understanding of the world 'outbound', that is, again understanding the socio-historical contexts of issues and problems as an aid in coping with the bounds of rational policy-making. Humanities scholarship can foster reflexivity on the limits of rationality in the development of public policy as societies collective action. The core contribution to science advice of the humanities is *recontextualizing decontextualized science advice*. (p.5)

The humanities might thus contribute to the understanding "that societal issues and policy problems differ from scientific questions and that in real life not every problem can be solved with the right knowledge." (p.6)

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These insights are helpful for framing the contribution of applied humanities to policymaking, and in particular the potential to enhance science advice when dealing with complex societal challenges and wicked problems, contextualising the bounds of science advice to take the uncertainty and unpredictability of societal processes into account. Science advice, according to the INGSA Manifesto (INGSA, 2018):

> … is the variety of processes and arrangements by which scientific expertise and policy making at different levels of government are brought into productive collaboration to address a variety of types of problems. We might add that the 'scientific' in this context includes evidence and expertise from the social sciences and humanities, as well as natural and physical sciences and engineering (p.6)

2.2.2 Understanding human political nature

A recent report from the Joint Research Centre (JRC) provides a broad understanding of our political nature, recognising that:

> The behavioral sciences, social sciences and humanities can bring us new insights into our political behavior, such as how and why emotions, values, identity and reason affect how we think, talk and take decisions on political issues. (Mair et al., 2019a, p.4)

In a series of workshops organised by the JRC, 60 invited experts from across Humanities, Social Science and Natural Science disciplines, discussed "the drivers of political behaviour" and "the most effective strategies for the optimal uptake of evidence into the political decision-making process". The workshop was framed by the following statement issued by the JRC:

> Policymaking, political debate and political decisions are better when they are informed by robust, pertinent and freely accessible evidence. Political questions cannot be "solved" in the same way as scientific ones because they are not purely analytical, they require normative trade-offs; science can only answer analytical questions about how the world "is" not normative ones about how it 'ought' to be. "Evidence-informed policy" is more accurate [than] "evidence-based policy" as it makes clear that evidence is an input to the political process and not the ultimate authority. The role of evidence in the policy debate is often challenged not because of general objections to evidence but because of the specific evidence used to inform single decisions. The choice of scientific evidence and its use to inform political decisions is normative. Evidence is essential because it provides the best available picture of reality, which imposes actual constraints on policymaking and potential costs and benefits. Scientific evidence can optimize political decisions and political debate by helping all political actors (citizens, civil servants, politicians) to make informed and autonomous decisions in line with their value preferences and priorities. (Mair et al., 2019a, p.8; paragraphs italicised in original)

The collective work of the multi-disciplinary team of experts eventually identified seven categories as essential to understanding our political nature.

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These have been summarised in the JRC report as follows (all quotations from Mair et al., 2019):

1. Misperception and Disinformation: "One aspect of human thinking that needs to be more widely recognised is motivated reasoning, the tendency to arrive at conclusions about evidence that match people's pre-existing beliefs [and] makes people resist evidence that runs against their beliefs." (p.12) "Emotional innumeracy is another important concept, [suggesting] that when worried about a particular problem, people tend to think it is more widespread than it is; making them worry about it even more." (p.13) Furthermore, "people have a tendency to focus on negative information, a negativity bias". (p.14) "Intention is the key difference between *mis*-information and *dis*-information. Misinformation refers to the spread of false information, but disinformation refers to false information shared with the intention of misleading others" (p.15), e.g. by spreading fake news.
2. Collective Intelligence: "Individually, human reasoning capacity is limited and subject to confirmation bias and motivated reasoning. Thinking collectively can overcome individual bias and significantly improve the quality of outcome but only if collaborative processes are carefully designed" (p.21). Sharing "all critical information, unique knowledge and expertise" (p.22) across the group can help avoid groupthink.
3. Emotions: "Better information about citizens' emotions and greater emotional literacy could improve policymaking." (p.29) "Citizens' political attitudes and behaviour are affected by emotions as well as their reason and perception of facts. While statistics and qualitative research provide policymakers with a detailed picture of the socio-economic reality of citizen's daily lives, this information does not capture their subjective lived experience and emotions as well, even if these may be more influential in their attitudes to the policy issues." (p.34)
4. Values and Identity: "Political decisions are strongly influenced by group identity, values, worldviews, ideologies and personality traits" (p.37), but these value and identity drivers are poorly understood. The importance of values in influencing "not only our political behaviour but also our perceptions about facts" (p.42) means that "they need to be considered from the initial development stages of the policy cycle." (p.42)
5. Framing, Metaphor and Narrative: "The human brain is primed to seek out patterns to construct meaning. […]This search for meaning gives power to the narrator who most effectively describes the world and its problems" (p.45). "Facts don't speak for themselves. Framing, metaphors and narratives need to be used in an ethical way if evidence is to be heard and understood fairly by all concerned actors." (p.45)
6. Trust and Openness: "Most of what anyone knows or believes about the world comes from the statements of others, so trust and trustworthiness are essential." (p.53) "Scientists as a group are among the most trusted in society. However, the authority of scientific evidence to help resolve political debates is being challenged." (p.53) "There is a need to be more transparent about the role of values in science, since scientists must usually make some value judgments and values are inevitably a part of the processes of scientific knowledge production." (p.54)
7. Evidence-informed Policy: "To get the right scientific evidence, it is vital that policymakers ask the right questions. Getting the research question right is a process that requires more extensive discussion and iteration. Instead of keeping scientists and policymakers at arms-length and working in a linear way, both could embrace co-creation and work in an iterative way from the very beginning. Building on this, a well-designed evidence-informed policy system would include knowledge brokers and boundary organisations, sitting between scientists and policymakers." (p.64)

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For each category, the report illustrates key insights from a multidisciplinary perspective and outlines broad possible implications for policymaking.

Informed by these categories, we develop a model for what we consider to be a helpful way of seeing a pathway to impact that accounts for the role of IDR/TDR with AHSS integration. This is further described in Section 3 and used as a way of organising our workshop findings in Section 4.

3 A Conceptual Model for Maximising IDR/TDR Impact on Society

In this section we propose a working conceptual model that reflects our efforts to represent the impact of IDR/TDR integrating AHSS on society. While we acknowledge that there is a rich and extensive literature on research impact and that there are many pathways to achieving such impact, this model is intended as a heuristic device to frame our thinking on how AHSS integration an contribute to societal impact.

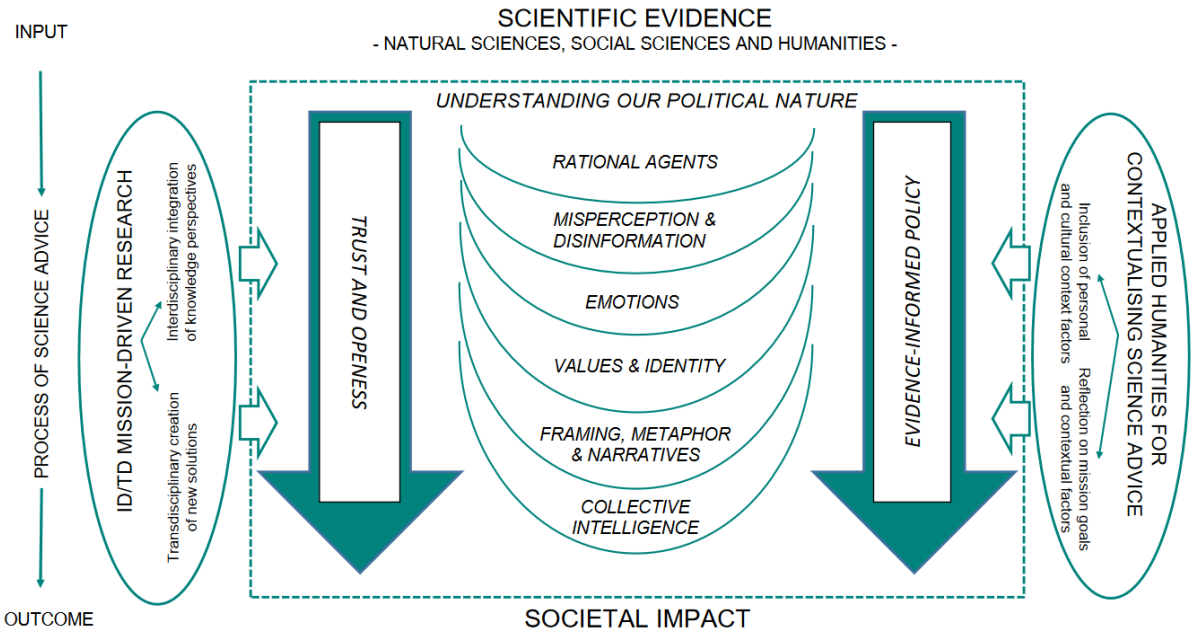

Figure 1 A Conceptual Model for Maximising the impact IDR/TDR integrating AHSS on society

The model frames the question of impact as a **process transforming the scientific evidence input into a societal impact outcome**. Before presenting the model in detail, it is necessary to introduce some caveats:

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- Firstly, the model is applied to the results of the SHAPE-ID workshops, not their methodology, in order to arrive at the most appropriate recommendations from our on how to enhance the impact of IDR/TDR integrating AHSS. The model equates the question of measuring the impact of IDR/TDR integrating AHSS on society to that of embedding mission-driven IDR/TDR integrating the AHSS into science policy advice. The emphasis is placed on evidence-informed policy as an important channel to deliver transformative societal impacts from research and innovation, but this is obviously not the only channel by which scientific knowledge influences societal change. For instance, in our initial deliverable describing the learning case workshop design (Sessa & Galvini, 2019), we focused on the Responsible Research and Innovation (RRI) paradigm and the contribution IDR/TDR and AHSS can make to delivering inclusive and ethical outcomes, but – also as a result of the insights that emerged from the workshops – we now see greater room for maximising the impacts of IDR/TDR and AHSS in the task of supporting a new way of doing and contextualising science advice to policy.

- Secondly, we acknowledge that the model oversimplifies the relation between the scientific evidence "input" and its processing in the science advice process. In reality, there is not a "stock" of scientific evidence that is applied mechanically by experts in the process of providing advice. There is instead a continuous and interactive process of knowledge development that is primarily driven by curiosity in the academic research milieu, and which is oriented by funding priorities to address societal challenges. However, the model focuses on science advice to policy, with the intention to show the fundamental logic governing any science advice attempt, that is, to translate scientific evidence into useful outcomes for society, suggesting new social and policy practice.

- Thirdly, the model is normative. It aims to describe science advice as we assume it should be, not as it is in reality. To support its future application, further mission-driven research is needed to investigate the role and practice of science advice in our democracies with a multi-disciplinary perspective, showing why evidence-informed policy making is a "cornerstone of liberal democracy" (Mair et al., 2019, p.61) and how to implement it in practice.

We can now continue with a more detailed description of the conceptual model presented in Figure 1.

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First of all – drawing on Kagan's (2009) concept of "three cultures" – the model adopts a broader understanding of "scientific evidence", including natural sciences, social sciences and humanities.[4]

Secondly, the impact pathway is framed using the categories for understanding human political nature described in the JRC report, to represent how deeply science advice should consider the different aspects of human nature.

In the model, the scientific advice process is represented as a sequence of knowledge mining steps, starting with the modelling of human actors (individuals and organisational actors) as rational agents – the standard economics perspective – digging progressively into the understanding of perception biases (the behavioural economics perspective); then emotions, including the psychology, neuroscience and other Arts and Humanities perspectives; values and identity (mostly the object of social, historical and cultural studies), a deeper layer of knowledge framing and narratives creation and eventually the production of collective intelligence.

This sequence of mining layers in the model represents a progressively deeper understanding of the human factors influencing the outcomes of science advice and policy delivery.

The two arrows pointing down to societal impact represent the other two categories of human political nature understanding introduced by the authors of the JRC study (Mair et al., 2019).

The left-hand arrow represents the inner dimension of building mutual trust and openness. As Mair et al. suggest:

> In order to earn the trust of citizens necessary to achieve policy impact, scientists and knowledge brokers can take a number of steps:
>
> - they can ensure that their work is open to scrutiny with regards to methods and assumptions so that the role of values and interests is easily identified;
> - they can take into account the values of their communities in making their choices; and
> - they can effectively engage with stakeholders and (groups of) citizens who may be affected by the results.
>
> (Mair et al., 2019, p.57)

[4] Kagan (2009) presents nine dimensions on which natural scientists, social scientists and humanists vary: the primary interest, the primary sources of evidence and control of conditions, the primary vocabulary, the influence of historical conditions, ethical influence, dependence on outside support, work conditions, contribution to the economy, and criteria for judging work to be "elegant or beautiful" (see Kagan, 2009, Table 1, p.4).

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In this respect, the deepest impact in terms of citizens' trust is achieved if:

> [p]ublic institutions […] more systematically integrate in the policy process different elements of stakeholder and citizen engagement – such as citizens' assemblies or deliberative polls based on a random representative selection of citizens and supported by scientific and policy experts to deliberate on wicked problems and controversial policy topics. (Mair et al., p.57)

On this side **ID/TD mission-driven research is included as the main leverage to deliver trusted outcomes**, by enabling better mutual understanding and trust between experts from different disciplines and policymakers – in the interdisciplinary stage of knowledge integration – or even extending these beyond the boundaries of scientific advice, by engaging citizens and stakeholders and creating a sense of belonging around a common purpose – in the transdisciplinary mode of knowledge co-creation, problem solving and prototyping of solutions.

The right-hand arrow represents **the outer dimension of evidence-informed policymaking**. While it is widely accepted that policy should be evidence-informed, a careful balance needs to be achieved, as a policy making approach "based" only on "scientific evidence" risks obscuring "the values choices that politics also has to make. Scientific evidence alone cannot determine what "ought" to be done, only the nature of the problem and the likely impact of the different options." (Mair et al., 2019, p.63)

In this respect, the deepest impact is achieved when policymaking "starts with an open and democratic initial framing of policy problems." (ibid., p.63) "Governments could seek to reach a consensus on the nature and framing of the problem and the evidence needed to describe it before debating solutions." (ibid., p.64) "Policy institutions could put in place incentives for policy makers to use and apply evidence in such participatory processes." (ibid., p.64)

On this side **applied humanities are included as the main leverage to successfully deliver evidence-informed policies**, contextualising the science advice to take adequately into account personal, social and cultural context factors, and to help develop a reflexive practice integrating different perspectives in mission-driven research and policies.

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4 Maximising Societal Impact for IDR/TDR with the Arts, Humanities and Social Sciences

As highlighted in the full report on the SHAPE-ID learning workshops, two main conclusions emerged from discussions about the role of AHSS ID/TD research to address societal challenges (Galvini et al. 2020, p. 9):

- The AHSS have a significant role to play in addressing societal challenges – not only in public engagement roles as is often the case in practice, but in helping to centralise and interrogate values, behaviours, attitudes and culture when defining and framing problems. Critical and historical perspectives can highlight the contingency of current narratives and open up a space in which to imagine alternatives. AHSS perspectives can help navigate the challenging and nuanced cultural issues at stake in the development of new technologies with significant impact on society and individual lives, not only to communicate or encourage adoption but to understand the problems more deeply and with contextual sensitivity.

- Relationships are key enablers of IDR/TDR. It takes time and trust to build collaborations, yet to achieve real societal change, it is critical to incorporate collaborators from outside of academia and for universities to build better links with policymakers, municipal authorities, citizens' groups, industry, artists and others. Time, resources and changes to education and training are needed to develop these capacities and funders should incentivise the strengthening of partnerships between universities and non-academic stakeholders. The importance of time to build relationships has several implications in terms of processes of change that need to be instituted at different levels, including facilitating informal encounters and exchanges between researchers and between researchers and stakeholders in policy, civil society, industry and other societal actors; long-term commitment to integrating research partners into education and training initiatives; and appropriate research infrastructure and training to enable sharing and reuse of data between different partners and stakeholders (within and beyond academia). Importantly, integration needs to be understood as a process that does not simply begin with the decision to collaborate on a project proposal or end with the completion of a project. Ongoing commitment (including appropriate resourcing) from higher education institutions, policymakers and funders is needed to build a sustainable culture of interdisciplinary and transdisciplinary research.

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Besides providing these general conclusions, the SHAPE-ID workshops enabled several discussions about IDR/TDR challenges and enablers, asking participants to draw lessons from their experiences and elaborate recommendations about how to enable IDR/TDR pathways, with particular attention paid to the value of including the AHSS disciplinary perspectives in research ventures addressing grand societal challenges.

In the following, we use the conceptual model presented in Section 3 to identify and organise the most interesting outcomes and recommendations from the workshops that resonate with some of the conceptual model categories.

The recommendations are presented as bullet point statements, complemented when available with boxes highlighting examples related to specific challenges.[5]

Applied humanities

- **Context-sensitive research:** Context is an important aspect in how policies set at a global level (e.g. UN SDGs) are translated or interpreted locally, as local policy makers set local budget lines and implementation. The ability of the AHSS to approach context in a deep and nuanced way and develop contextual knowledge suggests an important role for the AH in policy making, at both global and local levels.

- **Reflectivity and the long-term view**: Arts and Humanities (AH) disciplines are by nature reflective and can contribute a longer-term view that is not simply focused on current problems, technological solutions or current funding cycles. This can help counterbalance the short-term time frames and thinking of some applied technological/scientific research.

- **Contribution to foresight**: The AH also have potential therefore to contribute in the area of foresight. It was observed that foresight exercises take place in the sciences but seldom in the AH. The AH have a role to play in anticipating future consequences and tendencies because of a better ability to understand the present in all its complexity. The idea of a "predictive humanities" was proposed and was recommended as a change in how AH researchers are educated, improving their understanding of the transferability of their skills and opening up to a responsible relationship to the world.

- **Widening the scope of R&I**: Overarching themes and challenges were identified as one good way of bringing researchers and other stakeholders from diverse backgrounds together to work on a common problem. Reframing policy priorities is also recommended: decisions on investment and funding need to place societal benefit and not just financial return on investment at their core. The emphasis on innovation should be counterbalanced with efforts to achieve a more just and equal society and just innovation. By defining problems in terms that are relevant to people, the AH can help build stronger connections between research and society, including involving stakeholders from other sectors in research to participate creatively (co-creation).

[5] The text below is primarily extracted or adapted from the workshops report (Galvini et al. 2020)

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Examples discussed in the workshops

- **Critical analysis of climate change driven research mission:** AH can bring a critical perspective to bear on the methodologies for monitoring projects using SDGs indicators, e.g. adding critical analysis, discourse analysis, designing a methodology around collective narratives. AH can contribute to qualitative analysis of SDG indicators. For instance, a truly sustainable city is not only net zero energy but must be more broadly livable. The idea of a net zero energy city is connected to economic growth, but there are other pathways to achieving this mission, such as degrowth, reducing the speed of human societies' growth. Critical and pessimistic perspectives should be included as valid within a portfolio of projects.

- **Bringing a historical perspective to bear on climate change research:** By looking into the past, we can potentially find useful lessons for overcoming the current climate crisis. To assess the current situation, we have to understand why it happened and the long-term causes of activities.

- **Understanding ageing**: AH researchers can position current attitudes to ageing in a historical and philosophical context, looking at the history of ageing and how it has changed. This can help recognise prejudices and preconceptions about ageing.

- **Non-medical challenges of ageing:** the AH can provide perspectives that contribute to interventions that can help with non-medical aspects of ageing such as loneliness and isolation. These social aspects are contextual and non-Western attitudes and practices of medicine need to be considered. For example, older people in China may go to healers rather than doctors because the healer spends time with them. Better access to people, information and other forms of social connectedness are critical even when someone is free from sickness or pain.

- **The AHSS should be integrated into the understanding and regulation of digital technologies**, and this especially for the next wave of Artificial Intelligence (AI) technologies, encouraging greater AHSS participation in the innovation process of developing AI technologies. The challenge is to put human needs in the driving seat of AI development. Indeed, "AI-driven technology is entering more aspects of every individual's life, from smart home appliances to social media applications, and it is increasingly being utilized by public authorities to evaluate people's personality or skills, allocate resources, and otherwise make decisions that can have real and severe consequences for the human rights of individuals." (Council of Europe Commissioner for Human Rights, 2019, p.5) While the incremental developments in digital technologies have thus far aligned with human projections of progress, AI-driven technology is bringing a disruptive change that will radically challenge our social and economic fabric. The impact of COVID-19 is only making the challenges more urgent, with an acceleration of the ongoing trends in the digitalisation and virtualisation of life. This also applies to regulations concerning the research use of digital cultural heritage, including access to sources and text and data mining, discussed during the Warsaw workshop.

- **AI and technological development should not overlook the differences in the acceptability and fitness of solutions among different cultures.** The dissemination of AI and new technologies must consider the differences in language and interpretation adequately, to be better understood and eventually adopted by citizens. The hardest but necessary aspect to orienting AI for the good of society is to enable more open processes, "unboxing" the AI algorithms while implementing them in the societal context.

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Framing, metaphor and narratives

- **Lessons from the past**. Understanding the past provides a critical perspective from which we can understand the cultural contingency of prevalent narratives (hence the possibility of doing or thinking otherwise). We can learn from the past, particularly the failures of the past, from the deep perspectives of disciplines such as Archaeology and History. Historical memory is directly relevant to many societal problems in the world today.

- **Redefining research problems to centralise the human dimension**: an AHSS perspective should be involved in problem-framing to help understand and approach the problem in context and in human terms. The emphasis on human-centered values has the potential to reshape how a problem is framed and approached from the outset. In particular, the AH perspective can contribute to redefining what is of value by centralising the human experiences in contextualising and framing problems and projects, instead of their being led by the search for technological solutions. This can redefine the direction of research, for instance towards how to *live with* rather than try to *solve* problems that are complex and highly contextual in nature. E.g. how to live with dementia. Crises need also to be thought of in terms of their multiple and intersecting causes. Furthermore, the historical and critical perspectives of AH researchers can help highlight the contingency of current narratives and values, opening-up the potential to actively explore alternatives.

Examples discussed in the workshops

- **The importance of narrative to support climate change research and policy missions:** Behavior change and adaptability are important. Storytelling and narratives can help make the topic personal so that diverse groups of citizens believe they have more channels of participation rather than solutions being forced on them. The AH can connect beyond scientific facts through storytelling and support mainstreaming through popular culture. AH integration can better influence the language we use to describe it (e.g. “crisis”, not “change”) and also support a more rounded understanding of a subject, critical self-reflection and a social justice dimension. It was proposed to start with a back-casting narrative (work backwards from a story about a desirable future) and identify a way to mobilise citizens. AH approaches can also frame this mission as an urgent problem needing immediate action.

- **Addressing inequality and inclusion in ageing research and policies:** There is a risk that biomedical solutions may exacerbate social inequality by developing solutions that already privileged groups will benefit most from. AH participation can ensure questions about equitable access are central to the discussion in developing new treatments or technologies. Social and ethical perspectives highlight inequalities around physical manipulations and interactions. There are also issues of inequality of knowledge and framing. More inclusion and involvement of citizens and other groups across communities, ages, social classes, cultures, etc. is needed to involve society.

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Values and identity

- **AH perspectives understand value not just in terms of what is measurable but take emotion, ethics and societal and individual values into account**. By understanding and centralising issues that really matter to people, we have the potential to create powerful narratives that people can relate to. This has the potential to help build trust in fractured societies.

Examples discussed in the workshops

- **Showing the richness and discovery of later life** that co-exists with vulnerability. E.g. scientific research underpinning a theatre piece about singing in choirs and what people get out of participating in these activities.

- **Developing inter-cultural dialogues** as an alternative to technocratic responses to contemporary migration crises.

- **Defining the design and future of technology** that has real human and societal value, with the contribution of AH perspectives centralising human experience. For instance, in the health sector the AHSS can make an important contribution to communicating effectively, raising awareness and building confidence, for instance in the development of medical products that require a wide trial before being approved, or in clinical practice, where progress benefits not only from the scientific testing of the effectiveness of new therapies, but also from the inclusion in the analysis of idiosyncratic aspects that affect personal responses to the therapies. This is exactly the area where especially the Art and Humanities are essential to enable greater learning from personal experiences, narratives and self-expression.

- **Redefining values in climate change policies:** Without AH integration, we keep approaching problems with market-based solutions, instead of being driven by citizen concerns. For example, modelling forecasting is a 100% market-based mechanism (incorporating tech, credits divestment). AH perspectives can challenge this productivity framework in a fundamental way because of their practice of reflective and critical thought. Rethinking values can raise issues such as climate justice and question what is really of value. Indeed, striving for a just society and greater equality must underpin efforts to combat climate change. Decisions are currently made on the basis of financial return on investment (ROI). We need to work towards societal ROI, societal benefit and innovation justice, not just innovation.

- **Meaning and value in ageing**: AH perspectives can reframe the discussion on healthy ageing to incorporate questions of value and what it means to live a fulfilling life as we age (not just to live longer). This can capture the positive aspects of ageing through cultural works that have explored the deeper meaning of older age and values such as wisdom, dignity and aesthetic experience. AH approaches can contribute to countering stigma and focusing on the quality and richness of lived experience. AH research can capture narratives and paint a fuller picture of human experience that includes the social and spiritual aspects of ageing.

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Emotions

- **The role of artists and storytelling:** Artists often have better capacities to intervene as they can pick up the spirit of the times quickly. Art is what very often motivates us to take actions, since we often do things for emotional reasons. Storytelling and narratives can help make the topic personal so that diverse groups of citizens believe they have more channels of participation rather than solutions being forced on them. AH approaches can connect beyond scientific facts through storytelling and can support mainstreaming through popular culture.
- **Artist-led techniques:** One main outcome of the Zurich workshop was the space created for participants to experiment with tools that are not usually included in IDR/TDR, such as art-led techniques. Participants emphasised the need to think about different processes of integration that do not only take "problem-solving" as the main focus of attention, and might range from critical perspectives to the integration of values and emotions as means to find a common ground.

- **Tools for sentiment analysis**: Information and Communications Technologies (ICT) and AI tools can be used not only to track social behaviors with big data applications, but also to collect public feelings, sentiments and opinions about common concerns, evaluate the impacts of policy decisions, etc. Moreover, these tools can help to scale up citizen participation and inclusion of their oversight in decision-making processes, but this requires time, willingness to use new technologies and raising awareness of the more complex environment and challenges.

- **Digital cultural heritage**. By fostering connections and relationships between humanities researchers and the cultural heritage sector, we may better understand, depict and address the collective emotions relevant to the community's past. This could be achieved by bringing humanities questions to the fore of public-facing exhibition activities.

Misperception and disinformation

- Democracy is in transition because of the rise of populism and there is anxiety as to how it changed. People use different media channels than politicians and people in power did not anticipate this. Technology is moving far too fast for democracy to keep up and the actors who dominate the system have a competitive advantage. At a co-design activity in the Dublin workshop an applied humanities research mission was recommended for "Renewing and Safeguarding Democracy in Times of Rapid Technological, Economic, Social and Geopolitical Change" (see box below).

Ways for addressing crisis of democracy were discussed, including

- **Restoring confidence:** Examining how to restore confidence in representative democracy by examining the lack of trustworthy information and the issue of echo chambers on social media.

- **Comparison of old and new democratic instruments:** A historical perspective is needed to understand the current crisis as one of the instruments of democracy – e.g. referenda, voting, old systems versus new technologies.

- **Importance of democratic fundamentals:** Democracy is about freedom of speech, rule of law, etc., not only voting, and these also need to be examined.

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- **Better understanding of individual dimensions:** Individuals experience inequality, austerity, threats to their sense of identity and information overload. These experiences need to be understood as contributing factors to the breakdown of trust.

- **Mediating structures:** Deeper exploration is needed of the impact of mediating structures, looking at filter bubbles, polarisation, lack of dialogue, deep fakes, knowledge technologies affecting how we think, mistrust, disbelief in expertise, etc.

Collective Intelligence

- **Cultivating the ground for collaborative research:** Clear and discrete research questions, with one problem and multiple possible ways to address it necessitating different expertise, are needed to trigger collaborative research projects that deliver collective intelligence. Moreove, a good deal of time is needed to bring experts together to circle the field, discuss and explore potential. Interdisciplinary collaboration is a process passing through what Professor Barry C Smith, presenting at the Dublin workshop, described as the "4 C's": contact, confusion, conflict and finally collaboration. Finally, creating a level playing field is a challenge as there is often a hierarchy between disciplines. Researchers need to be humble and able to leave their ego at the door. Lack of shared goals and understandings, and breaking into silos, can lead to failure.

- **Workshops and other methods for collaborative exchange should be promoted as tools to support dialogue among disciplines and centres of education** and trigger teams and networks to co-create solutions for a joint mission, fostering inter- and transdisciplinarity within and beyond the higher education sector. These conversations and connections can be catalysed in courses and classes where students can develop transversal knowledge that cater to different interests and can be valuable to addressing a complex challenge, such as sustainability. Dynamic joint sessions with professionals from other disciplines would help students to engage in critical discussions and clarify conflicting perspectives and divergent stakeholder positions. For example, the objects for student analysis can be challenges already identified by interdisciplinary teams composed by a diversity of experts. Students would then be encouraged to investigate the issue from different angles and through various methods. For instance, if the topic is the problem of microplastics in the river, the research would be conducted considering biodiversity, water management, legal regulation, health consequences, etc. to co-create a new scheme for framing the topic and finding solutions.

- **Generally, combining a learning process based on real problems with strategic analysis, critical thinking and stakeholder engagement facilitates outreach activities, educational innovation and ultimately a better transdisciplinary collaboration**. A learning-by-doing approach in designing inter and trans-disciplinary educational programs can, for instance, engage students in scenario-based learning to co-create continuing storytelling.

- **Supporting Research Infrastructures as spaces where interdisciplinary collaboration may be initiated, developed and sustained.** Workshop participants dedicated considerable time to describing vehicles for fruitful collaboration, one of them being a research infrastructure (RI), which transcends the boundaries of single projects or teams. RIs, comprising of people, know-how and resources are crucial in preparing the ground for collaboration and connecting similar initiatives through introducing standards.

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A transdisciplinary Education for Urban Sustainability mission was discussed at the Turin workshop, resulting in specific recommendations

- **The Education for Urban Sustainability (EfUS) mission aims to establish a nexus between the educational process and sustainable urban transformation**, recognising that this would be potentially highly impactful for the concrete realizsation of the United Nations (UN) Sustainable Development Goals (SDGs) at local level, as well as the integration of AHSS and STEM disciplines. The need for a meaningful contribution from the AHSS in learning processes is increasingly crucial in a society mostly technologically driven. Sustainable urban transformation is an urgent matter, considering the concomitant climate, democracy, and urban governance emergencies, and this will require consolidating the cooperation between educational institutions and urban stakeholders. Focused on what students can do with their knowledge, Education for Sustainability is a value-oriented holistic approach, centered on social changes, based on real issues, experimental and transformative actions, and an active and critical learning enabled by forms of cooperative engagement. Education for sustainability is undertaken through system-wide change theory and practice, working partnership, system thinking, mindful participation, reflective and visioning activities.

- **Education for Urban Sustainability (or more in general for sustainability) can become a mainstream "third mission" activity of the universities.** This is challenging if one only considers the structural organisation of universities, especially humanities departments that are epistemologically and conceptually past-oriented, to consolidated disciplinary knowledge, that sharply limits the possibility of stretching the existing curricula and programmes to include interdisciplinary topics. Similarly, the bottom-up process to push institutions to create inter- and transdisciplinary courses encounters more administrative and bureaucratic barriers than a top-down process. In this respect, the universities' strategic plans can be a leverage point for overcoming the inertia the academic system, as well as a space where it is possible to match the universities' management goals with strategic aims to enhance inter- and trans-disciplinary education programmes.

5 Conclusion

On the basis of this analysis, and the full report on the SHAPE-ID learning case workshops (Galvini et al., 2020), we have further distilled recommendations for policymaker to increase AHSS participation IDR/TDR to provide more effective responses to societal challenges (Wallace et al., 2021).

We argue that the crises our societies face today are not only scientific and cannot be solved by science and technology alone. Substantial and meaningful AHSS participation in research addressing societal challenges can ensure that human values, culture and identity are placed at the heart of investigations into how to tackle these situations and that solutions can have positive societal impact. To begin with, this needs to be fully acknowledged by policymakers and a real long-term commitment

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to increasing and improving AHSS integration needs to be a priority. To support the culture change needed to make this happen, policymakers also need to support and incentivise change towards a culture appreciative of IDR and TDR within higher education systems, so that disciplinary silos, courses and reward systems, while still the foundation of excellent education and research, do not function as obstacles to coming together to address the "wicked" problems society now confronts. Finally, to ensure sustainable growth in this direction, support is needed for long-term community-building and resource-sharing, as well as for ongoing relationship-building with societal stakeholders, to ensure maximum engagement and potential for impact from research activities.

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