SHAPE-ID: Shaping Interdisciplinary Practices in Europe

SHAPE-ID Learning Case Workshops Intermediate Working Paper

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SHAPE-ID
Shaping interdisciplinary practices in Europe

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Table of Contents

![SHAPE-ID logo — Shaping interdisciplinary practices in Europe]

Foreword

The SHAPE-ID project was scheduled to organise six learning case workshops across Europe between December 2019 and May 2020 to enable stakeholders to explore best practices in interdisciplinary and transdisciplinary research (IDR/TDR). A report on the workshop series was scheduled for June 2020. The first three of these workshops – held in Dublin in December 2019, Edinburgh in January 2020 and Turin in February 2020 – took place as planned but the remaining three – intended to take place in Bilbao in March, in Warsaw in April and in Zurich in May 2020 – were postponed due to the COVID-19 outbreak. These workshops will now take place in a virtual format in September 2020 and the report on the results of all six workshops has been necessarily postponed to the end of November 2020.

This working paper has been prepared to share in a preliminary form the results of the first three workshops. This document is structured as follows:

- Section 1: Integration of challenge-oriented learning journeys

- Section 2: Overview of the three completed workshops' outcomes (Dublin, Edinburgh, Turin)

- Section 3: Detailed reports of the three completed workshops

- Section 4: Post-COVID remote learning case workshops

We emphasise the provisional nature of this report as the workshop series is ongoing. The outcomes of all six workshops will be synthesised and evaluated when the series is complete.

1 Integration of challenge-oriented learning journeys

The SHAPE-ID learning case workshops are 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 Arts, Humanities and Social Sciences (AHSS) disciplines. Participants are drawn from a wide range of disciplinary backgrounds and sectors and include AHSS and STEM 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 are organised by partners across Europe – Dublin, Edinburgh, Turin, Bilbao, Warsaw and Zurich – to enable the integration of perspectives from different regions. By consulting these experts, the project aims to test, validate and extend the findings of the SHAPE-ID literature review and survey and explore IDR/TDR methods and approaches for addressing societal challenges, missions or other complex issues where collaborative research across disciplines and sectors is needed. COVID-19 travel restrictions

necessitated the postponement of the latter three workshops and their reorganisation in a virtual format. This creates new challenges but also provides an opportunity to learn about the potential and pitfalls of remote collaboration – an increasingly likely scenario for those pursuing IDR/TDR in the near future.

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 significant underrepresentation of the Arts and Humanities in IDR/TDR to better understand the challenges of AHSS integration. Each workshop is 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 engage in activities to co-design missions and recommendations. This framework is intended to bring participants on a journey that deepens their understanding of other perspectives and from there enables 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.

Workshop	Date	Location	Organiser*	Challenge-oriented focus
Workshop 1	2-3 Dec 2019	Dublin	Trinity College Dublin	Positioning the Arts and Humanities to Lead Research Addressing Societal Challenges
Workshop 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
Workshop 3	17-18 Feb 2020	Turin	ISINNOVA (Politecnico di Torino)	Inter/Trans-Disciplinary educational models and approaches that support sustainable urban transformation
Workshop 4**	23-24 Mar 2020	Bilbao	ISINNOVA (University of Deusto)	Artificial Intelligence (AI) challenges and scenarios of collaborative learning, working and living with machines (co-robotics)
Workshop 5**	20-21 Apr 2020	Warsaw	IBL PAN	Streamlining Digital Humanities research and infrastructure in the cultural heritage domain
Workshop 6**	14-15 May 2020	Zurich	ETH Zurich	Intersections or reconfigurations? Arts and Humanities integration in inter- and trans-disciplinary research

*external collaborator in parenthesis   **redesigned as virtual workshops taking place in September 2020

Table 1 Workshops overview

Workshop 1 (Dublin) addressed the overarching question of how the Arts and Humanities can play a greater role, as leader 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.

Workshop 3 (Turin) addressed the challenge of education for sustainable urban transitions, in collaboration with the TrUST network based at Politecnico di Torino.

This working paper presents an overview and detailed report of each of these completed workshops. A full synthesis and evaluation of the results and recommendations in light of the SHAPE-ID objectives will be carried out once the series is complete but a number of high-level observations can be made here, which resonate with the findings of the SHAPE-ID literature review[1] and survey[2] and the recommendations[3] derived from these:

- The Arts and Humanities 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. To realise this potential, a number of complementary approaches are needed. On the one hand, capacity building is needed within higher education institutions to increase competence and confidence in researchers to develop IDR/TDR collaborations. On the other hand, fundamental changes are needed in how funding calls are written so that the AH are not treated as a "compensatory presence" in projects otherwise driven by STEM or Social Sciences perspectives. Funding calls should be written to explicitly include and integrate different disciplinary perspectives and AH experts with demonstrable interdisciplinary expertise should be involved in the peer-review process. Furthermore, different funding instruments – such as seed funding to build capacity and

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[1] Vienni Baptista, B, Fletcher, I Maryl, M, Wciślik, P, Buchner, A, Lyall, C & Pohl, C. (2020). *Final Report on Understandings of Interdisciplinary and Transdisciplinary Research and Factors of Success and Failure.* DOI: 10.5281/zenodo.3824839.

[2] Spaapen, J, Vienni Baptista, B, Buchner, A & Pohl, C (2020). *Report on Survey among interdisciplinary and transdisciplinary researchers and post-survey interviews with policy stakeholders.* DOI: 10.5281/zenodo.3824726.

[3] Vienni Baptista, B, Lyall, C, Ohlmeyer, J, Spaapen, J, Wallace, D & Pohl, C. (2020). *Improving pathways to interdisciplinary and transdisciplinary research for the Arts, Humanities and Social Sciences: first lessons from the SHAPE-ID project – Policy Brief.* DOI: 10.5281/zenodo.3824953.

relationships, two-stage application processes to encourage risk-taking, and research infrastructure funding to support larger institutional initiatives – should be deployed to actively encourage greater AH participation.

- 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.

2 Overview of the SHAPE-ID learning case workshops in Dublin, Edinburgh, Turin

2.1 Dublin workshop overview

The SHAPE-ID learning case workshop held in Dublin (2-3 December 2019, Trinity Long Room Hub Arts and Humanities Research Institute, Trinity College Dublin), addressed the question of how the Arts and Humanities could position themselves as leaders in research addressing societal challenges. The workshop aimed to identify practical solutions to overcoming barriers to Arts and Humanities (AH) integration and consider how the AH community can contribute to addressing societal challenges alongside colleagues in the Sciences, Technology, Engineering, Mathematics and Medicine (STEMM) disciplines and other stakeholders, in inter- and transdisciplinary research (IDR/TDR).

Following three short "scene-setting" presentations to share case studies of AHSS involvement in IDR/TDR, participants engaged in co-design activities to explore the potential of AH disciplines to contribute to or lead IDR/TDR addressing societal challenges; the mindsets and organisational cultures that act as barriers or supports to AH-STEMM integration; pathways to overcoming these obstacles; and how existing or potential "Missions" could be structured to incorporate AH leadership and substantial contributions.

What role can the Arts & Humanities play?

There was widespread acknowledgement of the specific **ways that Arts and Humanities perspectives can contribute** to how societal challenges are addressed in research projects. Most emphatically, it was felt that the emphasis on human-centred 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 and the societal, thereby helping rebuild trust in fractured societies. 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. 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.

What is needed to improve AH integration?

A number of key insights and recommendations arose from the discussions and activities:

- **Valuing disciplines:** strong disciplines are the foundation of good interdisciplinary collaboration, ensuring that partners bring deep and unique disciplinary expertise, and that they have the confidence to understand and communicate the value of these contributions. The importance of disciplinary training must be acknowledged and valued.

- **Supporting interdisciplinarity:** while maintaining an understanding of the importance of disciplines, institutions must also ensure that interdisciplinary researchers (from all disciplines) flourish rather than suffer for pushing boundaries and taking risks.

- **Relationships:** core to successful interdisciplinary collaboration are mutual respect and trust, which take time to establish. It is essential to factor in the time and space necessary to establish these, both prior to and at the beginning of major collaborative projects. Readiness to approach collaboration as a level playing field is important in overcoming power imbalances and misunderstandings that are common due to disciplinary cultures and a tendency within Universities and government policy to more highly value STEMM disciplines currently.

- **Funding instruments:** one important means of facilitating relationship building is providing seed funding to develop collaborations, with less risk to funders and researchers. Diversified funding instruments are also needed to support activities from small-scale exploratory projects to large-scale research infrastructure, which can provide the spaces and opportunities for collaboration.

- **Leadership, training and education:** there is a need for capacity-building to ensure AH researchers have the means to lead and collaborate in interdisciplinary research teams, particularly training about interdisciplinary work, facilitation and the translational activities involved in communicating research across disciplinary boundaries and beyond academia. The AH community need strong, enterprising leadership to enable this.

- **Challenge-based research questions:** 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.

- **Greater understanding:** there is a lack of meta-research on Arts and Humanities research and more work is needed to understand and effectively communicate the value of AH research.

- **Other voices:** researchers need to develop more open and inclusive structures to engage society. Recommendations included seed funding for building collaborations that include stakeholders from outside of academia, new inclusive fora for developing multi-stakeholder projects and pro-posals, and the involvement of citizens in aspects of proposal evaluation.

- **Reframing policy priorities:** 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. Per-spectives from the Arts and Humanities should be integrated into the understanding and regula-tion of digital technologies.

2.2 Edinburgh workshop overview

This SHAPE-ID Learning Case Workshop held in Edinburgh (20-21 January 2020, the University of Edinburgh) gathered experienced researchers from the AHSS together with funders, policy makers and representatives from other international bodies. By bringing an environmental humanities lens to bear on interdisciplinary collaborations, we hoped to learn more about potential enablers to facilitate AHSS integration in IDR/TDR.

Following three short "scene-setting" presentations to share case studies of AHSS involvement in IDR/TDR, participants engaged in co-design activities discussing the development of interdisciplinary research projects, critiquing funding calls and proposing appropriate peer review criteria.

The language prevalent in call texts was seen as very instrumental, instructive (rather than questioning) and likely to lead to interdisciplinary "tokenism". This approach was interpreted as a lack of trust in researchers where the Arts and Humanities (AH) were treated as a "compensatory presence" rather than having a role in defining research agendas.

Three broad areas for improvement were identified:

Writing the call

- How calls are written is critical to promoting the inclusion and integration of different disciplinary perspectives.
- Call texts should use language (including in call titles) that is more inclusive, accessible and jargon-free and specifically welcomes diverse ranges of methodological approaches.
- The goal should be co-creation involving an equitable, mixed disciplinary team for design.

Application process

- A two-stage application process involving an initial, blinded outline, followed by an invited full proposal, may encourage more risk-taking.

- Recognition is needed of the interpretive work required in identifying an AH angle on a call and the role played by intermediaries (e.g. National Contact Points and University Research Offices).

Peer review

- Innovative IDR/TDR proposals need suitable evaluators, which requires academics to sign up as reviewers, and there are currently too few AH academics.

- Peer reviewers and panel chairs for IDR/TDR proposals need to have demonstrable interdisciplinary expertise (not just experience in individual disciplines).

- Remote evaluation, rather panel discussion, might strengthen the AH voice.

- A more refined keyword system would guide evaluator selection.

Participants also highlighted:

- The role of national funders in building capacity;
- A lack of alignment between national and EU funding;
- A need for greater knowledge exchange and media training to enable the AH community to communicate the value of their research domains;
- A number of more widespread institutional issues related to the promotion of IDR/TDR that go beyond the EC encouraging greater participation in interdisciplinary grant calls.

2.3   Turin workshop overview

The SHAPE-ID Learning Case Workshop held in Turin, co-organised with the TrUST[4] research project at Politecnico di Torino, brought together researchers and experts from academic and non-academic institutions working in the field of **Education for Sustainability** to explore how inter- and transdisciplinary education can support sustainable urban transformations.

Multiple paths and processes for the implementation of inter- and transdisciplinary education, including shaping the vision and long-term goals of universities and developing collaborative exchanges

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across disciplines, are needed to realise a meaningful transformation on how topics will be taught and developed. **Practical examples** and **best practices** capable of adding value to subjects on an academic course and tangibly enriching students' mind can advantageously support the process of **transforming methodologies** and **programme structures** within educational institutions.

Inter- and transdisciplinary education is a complex process that requires deep and wide first-person experimentation to explore and digest its multiple facets. Paradoxically, such unstructured learning experiences need clear and defined **structures** and a **safe space** to manage a process more interactive and dynamic than more traditional teaching methods, demanding a greater preparatory workload, but on the other hand, ensuring better and long-lasting results.

Workshop participants outlined numerous hindering factors in the implementation of inter- and transdisciplinary education, which can be synthetically categorised as: **financial limits**, limits of time and space; the **organisational structure** of universities; **peer relationships**; cultural aptitude and **students' perspectives**. A concrete, detailed and practical framework for implementing inter- and transdisciplinary projects, together with an evaluation and **monitoring system** able to capture their benefits, could change the parameters behind the allocation of funding and overcome the effects of these hindering factors.

On the other hand, a combination of factors, like **specific competencies**, real cases for analysis and implementation, **personal and structural incentives**, and best practices for dissemination, have to act synergistically to support a sustainable urban transformation. Personal and structural incentives should enable an authentic citizens engagement too. Indeed, **ensuring citizens' sense of ownership of their cities** is a critical step for achieving a transformation towards sustainability.

3   Detailed reports of Dublin, Edinburgh and Turin workshops

3.1   Dublin workshop report: Art and Humanities to address societal challenges
Workshop Objectives and Activities

The SHAPE-ID learning case workshop held in Dublin (2-3 December 2019, Trinity Long Room Hub Arts and Humanities Research Institute, Trinity College Dublin), addressed the question of how the Arts and Humanities could position themselves as leaders in research addressing societal challenges. The workshop aimed to identify practical solutions to overcoming barriers to Arts and Humanities (AH) integration and consider how the AH community can contribute to addressing societal challenges alongside STEMM colleagues and non-academic stakeholders.

Here we present key insights synthesised from each section of the workshop, beginning with a summary of the Day 1 "scene-setting" presentations and subsequent discussion, followed by two rounds of a World Café group discussion addressing the potential, barriers and pathways for better AH leadership or meaningful involvement in IDR/TDR. Finally, we present the outcomes of the Day 2 mission-oriented co-design activities, where participants considered the potential for a portfolio of AH-led projects addressing selected missions: Healthy Ageing, Crises of Democracy and Climate Crisis.

Scene-setting presentations

Dr Susan Flavin

Dr Susan Flavin (TCD) presented on her ERC-funded project FoodCult, which takes a truly interdisciplinary approach to diet in early modern Ireland, with collaborators from history, archaeology, bioarchaeology/organic geochemistry and information technology, as well as artisans and filmmakers. The range of disciplines allows for a multiscale integrated analysis of diet. Each individual approach has its limitations in working with the historical evidence but through their overlaps a fuller picture can be achieved. The possibilities engendered by the collaboration are exciting in advancing the field and pushing the boundaries of historical method.

Dr Flavin spoke of remarkable meetings with real lightbulb moments as the team worked to find new ways of communicating across the different languages they were accustomed to speaking. She also noted that publishing interdisciplinary research was an ongoing challenge.

Professor Barry C Smith

Professor Barry C Smith (Institute of Philosophy, School of Advanced Study, University of London) shared insights into the scope, potential and challenges of interdisciplinary collaboration between the Arts & Humanities and Sciences, drawing on his experience as founding director of the Centre for the Study of the Senses, which pioneers collaborative research between philosophers, psychologists and neuroscientists, and as the Arts and Humanities Research Council's Leadership Fellow for the Science in Culture Theme. Professor Smiths' key insights on interdisciplinary collaboration included:

- A strong disciplinary base is essential for successful collaboration, to ensure partners have real expertise to bring;
- Collaboration must be bidirectional and reciprocal, with benefits for all contributing disciplines;
- Good interdisciplinary collaboration can speed up innovation, create new research questions and can potentially transform the contributing disciplines;
- Building the foundations for effective interdisciplinary collaboration takes time.

Professor Smith spoke of the potential for mutual learning between AH and STEMM disciplines with examples of the neurosciences and medicine interested in locating human experience within the sciences, looking at modes of reflection, cooperation and tools that feed medical practice. On the other side, AH disciplines are learning from the sciences to better understand the underpinnings of AH, opening up to new techniques and tools for AH objects of study, e.g. the nature of music or the embodied experience of seeing rooted in the brain.

Professor Smith argued that all disciplines can share a common interdisciplinary cause in addressing the major challenge of what it means to be human in the age of Artificial Intelligence, genetics and climate change.

Dr Marcus Collier

Dr Marcus Collier (TCD) discussed the challenges of working with multiple actors from outside of academia in his transdisciplinary Horizon 2020 research project Connecting Nature, which is working with city authorities to develop, implement and measure the impact of nature-based solutions in urban settings across Europe and beyond. The concept of nature-based solutions already undermines a long history of separation of nature and cities, looking at how nature can be seen as a form of technology, used to foster better relationships and address problems of urban living. Examples of nature-based solutions include the use of street trees, parks and urban green areas to provide a range of natural benefits such as intercepting dust, toxins and noise, sheltering and cooling property, sinking carbon and buffering flooding. They also provide spaces for recreation, fostering well-being, and a host of other social benefits. Social, cultural and environmental benefits are thus inextricably linked. Connecting Nature partners are only 30% academic, with significant involvement from city authorities, urban community groups and SMEs in developing, piloting and measuring the impact of such solutions.

Dr Kavita Sivaramakrishnan

Dr Kavita Sivaramakrishnan (Columbia University) presented a compelling case for humanities leadership in understanding and addressing the challenges of global ageing from a contextual, political, cultural and ethical perspective. The current global lifespan shift is unprecedented, with transformations in mortality rates and the rates of chronic disease creating very new life courses in a highly compressed way, particularly across Asia and Africa. Researchers from Social Sciences disciplines such as Demography, Sociology and Psychology already collaborate with biomedical sciences and are able to ask longitudinal questions and provide theories for societal medical and scientific shifts. However, contextual knowledge is lacking.

Considering the place of contextual knowledge and the potential role of the contextual disciplines, Dr Sivaramakrishnan argued that comparisons across contexts, identities and cultures is an essential part of a new life course perspective that views age and youth on a continuum. AH perspectives are also valuable in the translational activities needed to bridge the gap between the UN Sustainable Development Goals and how policy is made at a local level. Furthermore, the challenges of global ageing are not distinct from environmental problems and Dr Sivaramakrishnan proposed that overlapping research networks are needed to address these complex societal challenges with multiple intersecting causes.

Dr Jennifer Edmond

Dr Jennifer Edmond (TCD) discussed the transformative experience of leading the Horizon 2020 KPLEX project, an ICT-programme 'sister project' intended to inform future research and policy in ICT. KPLEX brought together researchers in literature and historical data, anthropology, research data archives and language technology services to bring a social sciences and humanities perspectives to 'big data'. One of the key challenges this interdisciplinary project tackled was overcoming language barriers, working towards a shared understanding of 'data'. As a sister project, the AH disciplines were unusually at the forefront of an ICT-related project rather than in the back seat. Dr Edmond highlighted a number of key factors for success in interdisciplinary research projects:

- the importance of dialogue and mutual respect;
- the need for facilitators and integrators to enable the translational work between disciplines;
- the value of reversing the usual hierarchies whereby the AH play tokenistic or service roles in ICT projects;
- the value of reciprocity;
- the importance of co-developing research questions;
- the need to be open to the unexpected;
- how rewarding interdisciplinary work can be.

Discussion

Discussion following the presentations focused on two key areas:

Disciplines and Collaboration

- **Strong disciplines are an important foundation:** Researchers need to be able to add value in a collaborative context and the best IDR projects are when people with strong expertise in different disciplines come together. Successful large-scale research projects often have a long run-in time,

with collaboration taking place long before the funding application. Lack of shared goals and understandings, and breaking into silos, can lead to failure. For example In the UK Arts & Humanities Research Council (AHRC) it is common for large-scale grants to have teams present together as part of the evaluation process to ensure they really work as a team.

- **Time to develop collaborations:** It can be risky for researchers to step out of their comfort zones. The temptation is to dedicate time where success is more likely and researchers need to satisfy their own disciplines first. 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 the "4 C's": contact, confusion, conflict and finally collaboration (Barry Smith).
- **Level playing field:** 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 ego at the door.
- **Collaborative research questions:** Need to be clear and discrete, with one problem and multiple possible ways to address it necessitating different expertise.

Bridging Research and Policy

Some discussion took place around the challenge of bridging the gap between research and policy.

- **Time Frames:** Policy and funding cycles are typically quite short whereas collaboration takes time to develop. Research and policy also involve and require different levels of depth.
- **Scale and Context:** 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 AH 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.
    - o **Example 1:** The Connecting Nature project has worked with city authorities with very different budget constraints and politics and engaged in a co-creation process to bridge gaps meaningfully. One mechanism involved using painting to successfully bring policy makers together and was developed by a partner who is a poet.
    - o **Example 2:** Following on from the KPLEX project, the Principal Investigator (PI) is looking at developing a 'humanities canvas' that could provide a model for taking an AH approach to any question or problem addressed in collaborative work, e.g. looking at discourse, representation, historical events, the everyday, etc.
- **Foresight:** It was observed that foresight exercises take place in the sciences but seldom in AH. Predictive or forecasting sciences are the focus and AH has a role to play here because of a better ability to understand the present. 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.

World Café

Round 1: the potential for the Arts and Humanities to contribute

Redefining research problems to centralise the human dimension

- **Centralising human experience:** In AH disciplines human experience is at the heart of methods and mechanisms of knowledge production. The AH can therefore centralise human experiences in contextualising and framing problems and projects, instead of their being led by the search for technological solutions.

- **Redefining what is of value:** AH perspectives understand value not just what in terms of what is measurable but take emotion, ethics and societal and individual values into account. By 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 build trust in fractured societies. E.g. Environmental humanities: narratives of the Anthropocene demonstrate the interconnectedness of the social and environmental.

- **Problem-framing:** an AH perspective should be involved in problem-framing to help understand and approach the problem in context and in human terms. This has the potential to bridge the gap between academic scholarship and society. The AH also have potential to contribute in the area of foresight.

- **Beyond 'problem-solving':** AH perspectives have the potential to redefine the direction of research, for instance towards how to live with, rather than solve, problems. E.g. how to live with dementia. Another example is the concept of the 'syndemic' as a broader understanding of crises in terms of multiple and intersecting causes. In the context of innovation and creativity, there is the potential to reclaim the concept of innovation by helping define what creativity is in the age of machine learning and Artificial Intelligence.

- **Connecting to wider societal concerns:** by defining problems in terms that are relevant to people, AH can build stronger connections between research and society, including involving non-academics in research to participate creatively (co-creation).

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

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

Putting the human at the centre of technological development

- **Human interactions in technological development:** AH perspectives centralising human experience can contribute to defining the design and future of technology that has real human and societal value.

The Long View: historical memory and reflection

- **Reflectivity and the long view:** 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 counter the short-term time frames and thinking of some applied technological/scientific research.

- **Learning from the past:** 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.

- **Critical perspectives and contingency:** 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).

Beyond the 'two cultures': realising the potential of Arts and Humanities integration

AHSS and STEMM: Similarities, Differences and Disparities

- The question implies a structural division between AHSS and STEMM, which we should not reinforce. In fact, both STEMM and AHSS disciplines try to prove, create and calculate things, but in different ways and with different tools. We should not think of competition between AHSS and STEMM disciplines to lead research.

- We need to acknowledge that within AHSS, as in STEM disciplines, some research lends itself to applications and other research is basic research and not intended or suited to application. This should be respected.

- We also need to acknowledge that AH disciplines are not exclusive in producing human-centred knowledge. Many modes of knowledge production do this and the division may not be helpful.

- Various views were expressed around how well AH and STEM researchers understand one another. Some had experienced of AH researchers knowing very little about science compared to how much scientists knew about AH. Others said that arts practitioners are very interested in sci-

ence. It was suggested that climate change and popular science may be leading to a growth in interest and knowledge. Within academia, cultural differences persist. For example, AH researchers find the hierarchies of science workplaces difficult to understand.

- The logic of academic research can exclude those (such as artists) whose research follows different logics. We should try to connect with other ways of knowing. Knowledge production outside of academia, such as in Museums, can be ignored or side-lined when the focus is on academic disciplines in interdisciplinary collaboration. A broader concept of research should accommodate research taking place outside of Universities.

- AH researchers (particularly artists) are not already embedded in policy contexts in the way that STEM researchers are and there is a sense that their knowledge is not respected. It is necessary to fight to be taken seriously by policy makers.

Leadership, Collaboration and Capacity Building

- The issue of whether confidence or competence is an obstacle to AH leading interdisciplinary research was raised. Capacity building is needed to realise potential.

- The following questions were raised: To what extent does an AH 'community' actually exist in an integrated form? How do they see themselves? Who leads this community?

- AH researchers must be proactive in exercising leadership and developing research projects.

- It is not necessary to speak of leading, but rather of being part of a team, with meaningful collaboration. The language of 'integration' emphasises this potential for constructive contribution.

- There is a need for education and training about interdisciplinarity and a shared understanding of collaboration.

Communication

- How well do we communicate what research does? Making people aware of what research has led to is critical and more stories about the impact of AH research are needed.

- Translational research: there is an assumption that perhaps AH researchers are better at communication but we struggle to try and show what it is we are doing. Forming an identity to communicate the value of the AH is important.

- Interdisciplinary researchers may be best positioned to undertake this translational work as they already need to understand different languages. Researchers occupying boundaries are accustomed to needing to communicate across these boundaries.

Round 2: Enablers, Obstacles and Practical Steps

Relationships as main enablers

One of the most commonly mentioned factors enabling successful collaboration across disciplines was interpersonal relationships and the time and effort needed to build trusting, respectful relationships.

- **Respect:** Not just understanding one another's work but valuing and accepting it, ideally moving towards genuine mutual enthusiasm. Positive attitudes such as an inclusive mentality, openness and curiosity were listed as important here. Respect needs to be shown to other disciplines and other non-academic stakeholders. Courage was also mentioned, as it is necessary to leave ego at the door, step out of your comfort zone and ask questions about what you don't know. Respect is needed to overcome some of the obstacles raised by disciplinary cultural differences and power imbalances (discussed below).

- **Building Trust:** Building trust is essential to effective collaboration and involves defining a question, arriving at a common purpose, identifying shared values and developing common vocabularies. It is important to acknowledge the hidden work that goes into this trust-building.

- **Time and Spaces:** Time is needed to build trust and time should be made available where possible even before a project begins. Spaces also need to be available for conversations to happen, with opportunities for collaborators to meet in person. Both are necessary to arrive at a deeper understanding of each other's perspectives and overcome barriers to understanding.

- **Leadership:** This was noted as an essential factor in bringing people together. The Arts and Humanities need enterprising leadership, people who understand the strengths of AH disciplines and build partnerships. In an example provided, a culture of belief in one Institute of Advanced Studies stemmed originally from one senior STEM researcher who took a lead in fostering this culture. Leadership for AH also requires taking the initiative and engaging with policy makers and others who set the agenda. Researchers need to become involved in defining policy, understanding how evaluation happens, etc.

Relationships were discussed in the context of enabling collaboration and overcoming obstacles presented by disciplinary cultures, embedded bias and power disparities between partners.

Disciplinary Cultures, Bias and Power as main obstacles

The importance of strong disciplines was emphasised, but for the most part differences between disciplinary cultures were discussed as obstacles to collaboration, leading to embedded assumptions and bias and frequently reflecting disparities in esteem between STEM and AHSS disciplines.

- **Strengths of Disciplinary Culture:** Strong disciplines and strong 'fences' between disciplines are important in allowing what is unique and valuable about each discipline to develop and this must continue to be supported. This leads to researchers with distinct expertise who are better placed to bring something of value to a collaboration. Co-creation necessitates that researchers can lead with their own expertise. For example, AHSS researchers can speak to how they can contribute to the specific challenge of Alzheimer's and work collaboratively.

- **Differences in Disciplinary Cultures:** Differences in how disciplines see trajectories and outputs for research, as well as their respective time scales to achieving results, costs of research and different cultures of collaboration, can create obstacles to mutual understanding. For example, STEMM research is often costlier than AHSS research and the value of a given sum of money is therefore experienced as less than it would be in AHSS disciplines. Collaboration is also a more established part of STEMM cultures compared to AHSS.

- **Identification with Disciplines:** Researchers can often identify personally with their disciplines and this can obstruct meaningful collaboration if it results in defensive attitudes and a narrow focus on academia.

- **Power Imbalances:** Rather than pretending that power asymmetries do not exist between STEM and AHSS disciplines in a collaboration, we need to acknowledge where they do exist and work to overcome them. The systems of reward and incentives for interdisciplinary research are often unequal. Within academia, suggestions to address this balance included diversifying the voices that are heard in relation to a given issue and avoiding tokenism in collaboration with AHSS researchers. The problem of power extends beyond academia. For example, a patient rarely has the same power as a medical professional. Some funders and charities have addressed this well, looking at Public and Patient Voices (PPV).

- **Embedded Bias:** Creative thinking and skills are misunderstood and not valued in policy and institutional thinking. There was a suggestion that unconscious bias towards 'soft' disciplines is connected to gendered thinking.

- **Disparity of Esteem:** There is a problem of 'epistemic injustice' whereby STEMM disciplines tend to be valued more highly in the current system. STEMM research costs more and brings in more research funding. They are also far better embedded in industry. Universities adopt STEMM as the reference point for measuring performance, with AHSS researchers expected to adopt this model to be valued. Further, government policy often values STEMM disciplines more highly. For example, in Ireland there is a major policy focus on STEMM research, even though the main ERC successes were in the AHSS (a core strength of the Irish and UK academic systems). It was also

suggested that AH researchers are more often encouraged to seek collaboration with STEMM researchers than the other way around.

Careers, Education and Training

A number of obstacles and challenges were identified in relation to researcher career structures and institutional structures providing researcher education and training.

- **Career Risks for Early Career Researchers:** Although it might be expected that younger researchers would be more open to engaging in IDR/TDR, in practice it is often considered risky to their career paths. It was noted that it is often more senior academics who take on IDR/TDR as they are seeking a challenge. It is important to foster a culture within Universities whereby collaborators will flourish and not suffer from taking these risks and going outside of their comfort zones. A number of steps were suggested to improve reward structures for younger academics crossing disciplinary boundaries, including joint appointments within Universities (between Schools/Departments/Faculties) and between Universities and other institutions.

- **Educational Silos:** The potential for IDR/TDR is hampered by the narrow disciplinary base of much undergraduate and school education. The long-term trend has been towards ever deeper specialisation. It was suggested that a broader cultural change in education is necessary to avoid the formation of silos, starting even with second level education. Broad teaching and pedagogy at undergraduate level was recommended to foster understanding across disciplines.

- **Training:** There is often little opportunity to develop leadership skills in the AH disciplines and training was recommended to foster leadership development. Training was also recommended in facilitation skills, to enable interdisciplinary conversations.

Practical Steps: Funding, Infrastructure and Supports

A number of topics around funding and infrastructural supports were raised:

- **Diversified Funding Instruments:** In general, it was recommended that a range of funding instruments should be used to fund IDR/TDR projects to create more diverse opportunities, including support for both bottom-up and top-down initiatives. Funding instruments should take into account the need for relationships to develop and trust to be built for successful ID/TD collaboration to take place.

- **Seed Funding:** The need for seed funding came up in a number of discussions. It was recommended as necessary for kick-starting collaborations on smaller initiatives or challenges. The importance of travel for developing collaborations should be considered.

- **Funding for IDR Infrastructures:** This was recommended in order to create crucibles for new research as it addresses the importance of having physical infrastructure in place to facilitate new conversations and collaborations across disciplines (e.g. Durham Institute for Advanced Studies).

- **The Impact of Funding:** Funding instruments not only facilitate research but have an impact on perceptions. The ERC was mentioned as a success in introducing parity between AHSS and STEMM disciplines through a demand-driven budget. On the other end of the spectrum, it was suggested that efforts to integrate 'SSH' in collaborative projects in H2020 LEIT and Societal Challenges Work Programmes has led to superficial and tokenistic integration in order to tick the box of involving AHSS.

- **Application Procedures:** One-size-fits-all application procedures and templates can create barriers to some applicants, e.g. applicants from the Creative Arts, discouraging participation even where calls seek to encourage it.

- **Institutional Supports:** It was suggested that Research Performing Organisations should develop and implement rules and policies on the basis of best practice to support IDR/TDR, including revising hiring practices to support joint appointments (as discussed above). Support for grantsmanship was also mentioned as an enabling factor within institutions.

- **Theme-based and Challenged-based Research:** Theme-based and challenge-based research questions were mentioned as an important enabling factor for IDR/TDR, allowing researchers to work together on an important challenge. An example of the Global Brain Health Initiative (TCD) shows how success can be achieved by bringing new expertise to bear on the challenge of global ageing, rather than focusing on individual careers.

Practical Steps: Better Understanding and Communication

More generally, it was acknowledged that there is no single solution and much more work remains to be done to translate the recognised potential of AH into concrete practical steps. To support this work a number of recommendations were made:

- **More meta-research:** There is a lack of meta-research on AH research, which can make it difficult to properly situate AH research in relation to STEM research. It was suggested that more such research is needed (the equivalent of more Science and Technology Studies research directed to AH research).

- **Recognising Hidden Work:** It is important to better understand, acknowledge and foreground the opportunities and challenges involved in doing IDR/TDR and to recognise the often hidden work involved in making collaborative research work.

- **Communicating Value:** The AH community needs to be able to identify areas where problems cannot be solved by technical, economic or political measures, demonstrating how AH inputs may be

crucial, e.g. intercultural dialogue through literature and the Arts. AH researchers also need to be confident in communicating the value and potential of their contributions to researchers in other disciplines for the purposes of collaboration.

Mission-Oriented Research Co-Design Activity

In groups, participants engaged in a co-design activity to design research and innovation missions based on specified challenges: climate change, healthy ageing and the crises of democracy. Groups were asked to consider how each challenge might be addressed both with and without AH integration to enable comparison and identification of the added value AH perspectives could bring. They were then asked to design the broad parameters of missions using a template adapted from Mazzucato (2018).[5] Finally they were asked to present three key recommendations following the activity.

Climate Change

Addressing the Challenge With & Without AH integration

Several key ideas arose from the discussion of what addressing the 'Climate Change' challenge could look like with or without the involvement of AH perspectives:

- **Redefining Values:** Without AH integration, we keep solving 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 can challenge this productivity framework in a fundamental way because of their practice of reflective and critical thought. Rethinking value can raise issues such as climate justice and question what is of value.

- **The Importance of Narrative:** 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. AH can connect beyond scientific facts through storytelling and support mainstreaming through popular culture.

- **The Importance of Language:** AH integration can better influence the language we use to describe it (e.g. crisis does not change) and also support a more rounded understanding of a subject, critical self-reflection and a social justice dimension.

- **Critical Analysis:** AH methodologies for monitoring projects using SDGs indicators, e.g. critical analysis, discourse analysis, designing a methodology around collective narratives.

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[5] Mazzucato, M. (2018) Mission-Oriented Research & Innovation in the European Union: A problem-solving approach to fuel innovation-led growth. Available at https://ec.europa.eu/info/sites/info/files/mazzucato_report_2018.pdf

- **Bringing a Historical Perspective:** By looking into the past, we can potentially find hope and useful lessons for overcoming the current crisis. To assess the current situation, we have to understand why it happened and the long-term causes of activities.

Defining a Mission

Similar points arose during the discussion of how to formulate a mission:

- **Narrative:** 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 can also frame this mission as an urgent problem needing immediate action.

- **Evaluation:** This mission is linked to *SDG 13.2: Integrate climate change measures into national policies, strategies and planning*. AH can contribute to qualitative analysis of SDG indicators

- **Critique:** A critical perspective was brought to bear on the question. A truly sustainable city is not only net zero energy but must be more broadly liveable. 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 approaches within a portfolio of projects.

- **Education:** AH was considered important for education, raising awareness and translating SDG broad goals into policies and practices. SDG indicators need to be adapted to local contexts for individual cities. AH contribution to education can ensure climate justice is considered.

Key Recommendations

1. **Embedding broadened approach to thinking that includes AH in education at all levels.** More informal learning, soft skills, thinking about narrative. Horizon Europe programme linking with Erasmus programme and synergies should be developed.
2. **Structuring the political agenda for inclusivity.** Striving for a just society and greater equality must underpin efforts to combat climate change.
3. **Requirement for investments and funding.** 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.

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Mission Design Template

CHALLENGE

Climate Change

MISSION

Net Zero Greenhouse Emissions

within just cities by 2030

STAKEHOLDERS

- Private sectors
- Policymakers
- Citizens
- Universities
- NGOs

STRUCTURES & RESOURCES

- Funding and investments
- Communication and information
- Leadership
- Capacity building
- Transformative governance
- Democratic process
- Policy
- Education
- Governance

PROJECTS

Narratives (Storytelling)

Research projects that investigate how decision are taken

A qualitative study the SDG indicators

Investigation of values

Examining the pessimistic perspective and critical analysis

Healthy Ageing

Addressing the Challenge With & Without AH integration

It was acknowledged that much is being and can be achieved on the medical front without AH involvement from the point of view of treatments and curative interventions on a physical level. However, the biomedical view can pathologise ageing, missing much that is important to the experience of ageing. The added value of AH integration was outlined on a number of fronts:

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.

Meaning and value in ageing: AH perspectives can reframe the discussion 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 can contribute to countering stigma and focusing on the quality and richness of lived experience. It was noted that the value of culture (e.g. the creative and performing arts) is better understood than the value of AH scholarship. AH research can capture narratives and paint a fuller picture of human experience that includes social and spiritual aspects of ageing.

Non-medical challenges of ageing: 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.

Addressing inequality: There is a risk that biomedical solutions may exacerbate social inequality by developing solutions that already privileged groups will benefit most from. AH 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.

Public inclusion in research: 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 beyond the University.

Defining a Mission

The mission articulated for this challenge was: "**define what it means to be 'well' in older life**". The following points were identified as important to exploring this:

- Aim to recalibrate, reappraise or re-evaluate the importance of quality of life in older age.
- Consider the role of arts and culture in healthy ageing.
- Develop strategies for wellness which investigate multiple ways to deliver this. The challenge should be opened up to allow solutions coming from a plurality of perspectives.

Key Recommendations

1) Programme funding that includes smaller seed grants to build capacity and encourages new partners from AH and outside of academia into collaboration
2) We need new fora for developing multi partner proposals including citizens (new forms of decision making (citizen assemblies etc.)
3) Involve citizens in evaluation of proposals

CHALLENGE

Healthy Ageing

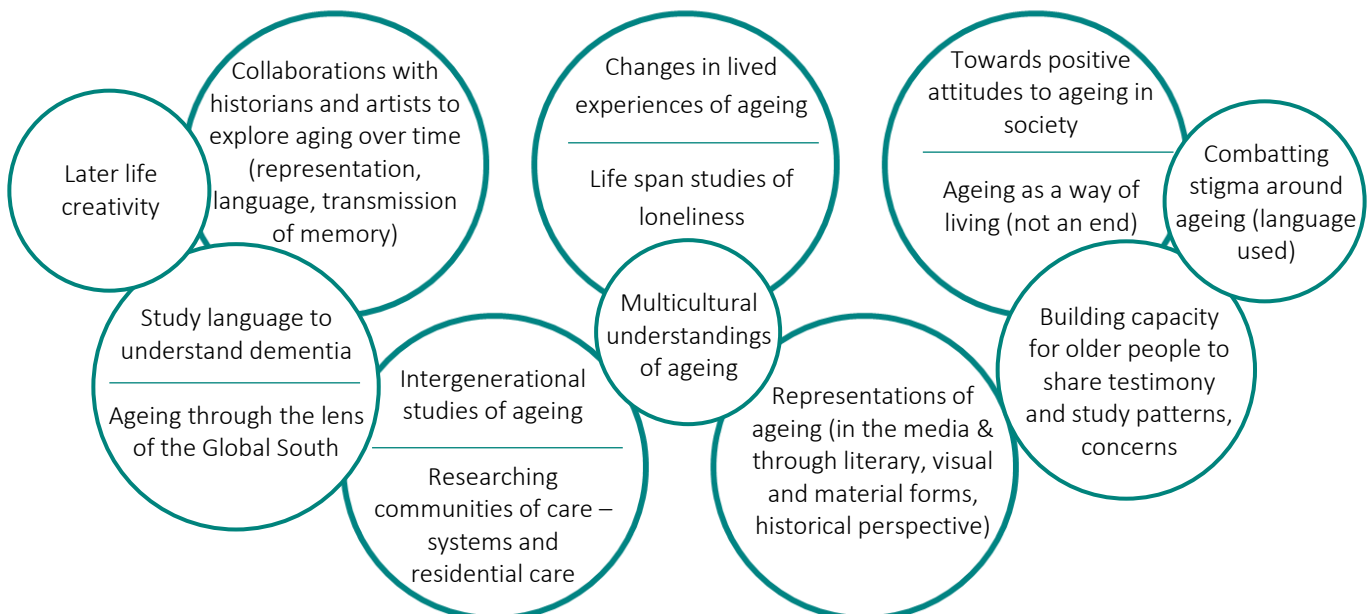# MISSION

Define what it means to be "well" in older life

STAKEHOLDERS

- AHSS and STEMM scholars
- AHSS umbrella organisations to analyse critical mass in scholarship
- Public knowledge
- Who sets the agenda? Understanding research priorities and funding agencies.
- Older people and support organisations
- Intergenerational, intercultural, place-related quality of life dialogues

STRUCTURES & RESOURCES

- Fora for developing multi-partner proposals including citizens
- Prototyping solutions (Danish e.g. of civic prototyping)
- Seed funding to introduce new partners (inc. non-academic) and build capacity
- Citizen evaluation of proposals
- Grants for bringing in people with other skills and experience (non-academic)
- Attitude change towards hierarchies within AH: value joining IDR community

PROJECTS

Later life creativity

Collaborations with historians and artists to explore aging over time (representation, language, transmission of memory)

Study language to understand dementia

Ageing through the lens of the Global South

Intergenerational studies of ageing

Researching communities of care – systems and residential care

Changes in lived experiences of ageing

Life span studies of loneliness

Multicultural understandings of ageing

Representations of ageing (in the media & through literary, visual and material forms, historical perspective)

Towards positive attitudes to ageing in society

Ageing as a way of living (not an end)

Combatting stigma around ageing (language used)

Building capacity for older people to share testimony and study patterns, concerns

Crisis of Democracy

Addressing the Challenge With & Without AH integration

The discussion did not particularly focus on what addressing this challenge with or without AH involvement could look like but explored aspects of the challenge and what was contributing to the crisis. The following points arose:

- **Centralisation of decision making:** More decision making is centralised with fewer people and spending is not distributed equitably around countries, with unequally distributed access to resources, services and structures.

- **Is there really a crisis?** It was proposed that Brexit may be democracy functioning and not democracy in crisis. In the UK there is a clash between representative and direct democracy.

- **Better understanding of populism:** 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.

Defining a Mission

The mission was defined as "Renewing and Safeguarding Democracy in Times of Rapid Technological, Economic, Social and Geopolitical Change" and ways of addressing this were discussed:

- **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 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.

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

- **The role of artists:** Artists have better capacities to intervene as they pick up the spirit of the times quicker. Research always takes more time. Art is what very often motivates us to take actions, since we often do things for emotional reasons.

Key Recommendations

1) Participatory and creative public engagement. Developing more open and inclusive structures that engage society. AH can bring in context from history, philosophy etc.
2) Fundamental research into formation of collective identities through the lens of narrative, language, culture, history etc.
3) Integrating AH into understanding and regulation of digital technologies.

CHALLENGE

Increase Trust in the Functioning of Democracy

MISSION

Renewing and Safeguarding Democracy in Times of Rapid Technological, Economic, Social and Geopolitical Change
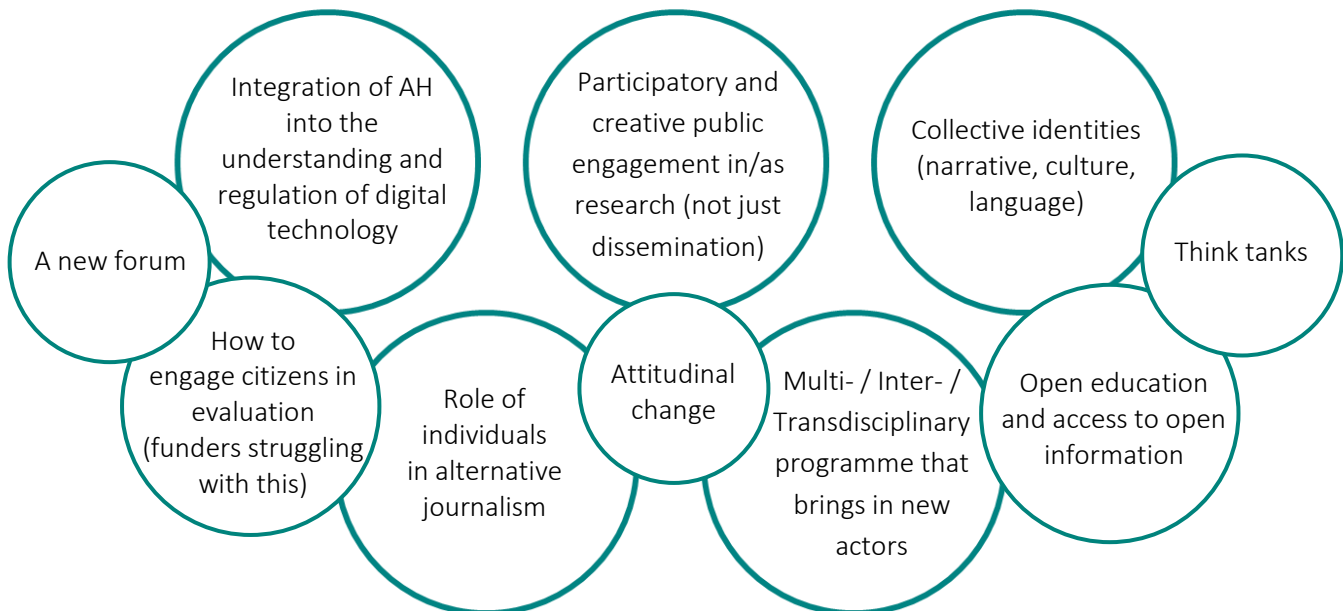
STAKEHOLDERS

- Excluded/marginalised people
- Artists
- Single individuals and the public
- Young people
- Policy makers national and international
- NGOs
- Academia
- Business and technology sectors
- Educators
- Local/national government

STRUCTURES & RESOURCES

- Participation in research
- Language and culture
- Open education
- Education and funding
- Access to open information
- Communications technology
- Connecting universities with citizens
- Interdisciplinary centres
- Think tanks

PROJECTS

- Integration of AH into the understanding and regulation of digital technology
- Participatory and creative public engagement in/as research (not just dissemination)
- Collective identities (narrative, culture, language)
- A new forum
- Think tanks
- How to engage citizens in evaluation (funders struggling with this)
- Role of individuals in alternative journalism
- Attitudinal change
- Multi- / Inter- / Transdisciplinary programme that brings in new actors
- Open education and access to open information

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Final Discussion

A short plenary discussion was held after each mission area group reported back to the wider group. The main issue raised was the extent to which the AH community is ready to accept and engage with research agendas set externally and focusing on societal challenges. AH cultures typically focus on individual scholarship and set their own agendas. It may be necessary to do this first in a bottom-up way within the community before engaging more broadly.

Institutions need to put in place strong support mechanisms for AHSS as institutional supports are needed to create groups working together. Big challenges or themes can bring together different research groups and faculties but need to be established from the top down. It was observed that UK universities excel at getting funding because they have good research funding infrastructure.

During the final session, the points raised indicated a pathway from individual disciplines to doing interdisciplinarity:

Disciplines: It is important to encourage and facilitate interest-driven research as well as grant-driven research following current funding priorities. AH researchers who wish to work on interdisciplinary problems such as ageing are advised to simply start working on it from their own perspective, bringing their own disciplinary expertise, before attempting to engage with IDR.

Capacity Building: There was evidence of great enthusiasm for working across disciplines, but people were very conscious of the barriers. There was a sense of insecurity around how AH research could be relevant, and anxiety too from stakeholders in the worlds of business and art as to their role in research and their place at the table. Institutional supports are needed to build confidence, to facilitate discussions and to invest in fostering leadership capacity in the AH.

Inclusive Fora: The issue of how to involve non-academic stakeholders was raised repeatedly, with widespread interest in how to bring these important voices into the discussion. There was concern that academic voices represent an elite and academic language can be alienating. To change in the ways that are needed the University needs to open up to other voices. It was suggested that an ideal starting point is to define a problem of common interest and begin to bring people together around this. The workshop itself was cited as an example of a structure that could be transferable to create for a for discussing problems of interest.

Including the Arts: Participants also noted the potential value of the arts, drama, narrative and social experiments to connecting different groups and understanding different cultures, as well as allowing us to explore conflict and difference, engaging emotion and providing opportunities for reflection.

Critical Thinking for Change: The AH community need to consider how the critical thinking deployed in their disciplines can contribute to the development of scenario planning and different trajectories for the future, and how to mobilise around them.

3.2   Edinburgh workshop report: Environmental Humanities

Workshop Objectives and Activities

The SHAPE-ID Learning Case Workshop held in Edinburgh (20-21 January 2020, the University of Edinburgh) brought experienced re-searchers from the AHSS together with funders, policy makers and representatives from other international bodies. The objective of this workshop, which took place over two half days, was to explore what discussions with colleagues who share a broad interest in the Environmental Humanities might reveal about the motivations for undertaking research in this field and the models and styles of such research. By bringing an Environmental Humanities lens to bear on interdisciplinary collaborations among the AHSS disciplines and (to a lesser extent) between AHSS and STEMM, we hoped to learn more about potential enablers that might facilitate AHSS integration in interdisciplinary and transdisciplinary research (IDR/TDR).

Our focus on the Environmental Humanities was motivated by the fact that this is an area of scholarship that is establishing itself as an interdisciplinary research field supported by peer review journals, international conferences and centres of excellence. Collectively, as a consortium and as a wider community of scholars, the SHAPE-ID team has experience of interdisciplinary topics that span (primarily) the social and environmental and natural sciences. In running this workshop, we hoped to compare this experience with that of the arts and humanities (AH) disciplines, given their typically different working styles and concerns (e.g. lone scholar vs. research teams; conceptual/philosophical vs. instrumental framings, etc.).

The workshop opened with an icebreaker session using visual images to prompt **discussion about participants' experience of IDR/TDR** which allowed us to gather information about barriers/opportunities/level of engagement with IDR. This was followed by **three short "scene-setting" presentations to share case studies of AHSS involvement in IDR/TDR**. Speakers were asked to highlight barriers and enablers and to consider the benefits (and possible disbenefits) to Environmental Humanities research:

Dr Anna Antonova (Rachel Carson Centre for Environment and Society, LMU Munich, Ger-many) spoke eloquently of her experiences as an interdisciplinary Early Career Researcher, highlighting the rewards

and pleasure of working across disciplinary and sectoral boundaries while facing the challenge of negotiating the very traditional disciplinary structures of the University.

Professor Naomi Sykes (University of Exeter, UK) offered insights from a number of highly interdisciplinary projects centred around animals. Discussing examples of two projects focusing, respectively, on the chicken and the fallow deer, Professor Sykes showed how these were used as a lens to explore human-animal interactions and our relationships with the natural world from a variety of cultural and scientific perspectives, revealing how relationships with and to animals feeds directly into policy.

Professor Dolly Jørgensen (University of Stavanger, Norway) presented on her experience leading the In the Clouds project, an Art-Science workshop funded by the Research Council of Norway. The project brought together scholars in Art History, History of Science and Technology, Environmental History, Anthropology, Media Studies, Science and Technology Studies, Geography, Religious Studies and Computer Science, with photographers, filmmakers, painters, poets and performance artists, to collaborate with a museum on an exhibition on clouds, examined from this diversity of perspectives. Professor Jørgensen reminded us that excellent interdisciplinary research can occur within the broader Arts and Humanities community and does not necessarily require collaboration with STEMM (Science, Technology, Engineering, Mathematics and Medicine) disciplines. She also spoke about how she had approached re-cent grant call and how her strategy of reframing it so that it better fitted her interests as an AH scholar had been successful.

After the presentations the group split into smaller working groups to engage in co-design activities around the development of research projects and funding calls. In the first exercise, each group worked to outline an inter- or trans-disciplinary research project based on a short text on environ-mental challenges.

Participants were asked to cast themselves as researchers (or potentially research users) and **to co-design an interdisciplinary research proposal** in response to a prompt such as a press release that de-scribed an environmental challenge. This group exercise allowed participants to reflect on what they had heard from presenters and to expand on, and explore, their own experiences/ aspirations/ disappointments of IDR/TDR. The output from this short exercise took the form of a poster that started to de-scribe a possible research proposal. However, the key purpose of the exercise was to encourage participants to **reflect on the process of designing collaborative, interdisciplinary research**, and less on the detail of the actual research proposal.

On the second morning of the workshop, participants again worked in groups, this time **to critique and redesign existing funding calls** dealing with environmental issues so that they might better include some of the priorities of AH research and encourage the participation of these researchers to address the challenges outlined. Having rewritten some of the call text, participants were then asked to pro-pose **peer review criteria/processes** that were fit for purpose for this call. Participants were guided in this activity by a series of observations on the co-design process adapted from Pohl et al. (2017) (see Table 1).

Distinguishing between research question and societal problem	**Makes the researchers reflect about what the societal problem actually is, and if and how their own research contributes to solving a societal problem**
Is the knowledge needed what research may provide?	Researchers need to reflect on different forms of knowledge their project could provide, and compare it to the actual knowledge needed
Disciplines and societal actors involved in research	Increases awareness of relevant expertise and decision power available elsewhere
Expectations and interests of societal actors / disciplines	Researchers must substantiate why societal actors and other disciplines need to be involved in order to make vague notions of involvement and interaction explicit and concrete

Table 2 Observations on co-design process. Adapted from Pohl et al. (2017) Ten Reflective Steps for Rendering Research Societally Relevant, GAIA 26/1: 43 − 51

Workshop Outcomes[6]

Factors that support/hinder IDR/TDR

The SHAPE-ID initial literature review (Deliverable 2.1) has identified 25 key factors that might support or hinder IDR/TDR. During the workshop, moderators were attuned to identifying any of these aspects that might arise during the group exercises and this allowed us to test out some of our preliminary findings from the literature. These factors are summarised in the form of a word cloud[7] (Figure 1) where

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[6] The data gathered during this workshop came in a variety of formats including contemporaneous notes (written by the seven members of the SHAPE-ID team present who acted as facilitators, discussion moderators and observers) and notes produced by participants as annotations on their posters. These latter were captured using the handwriting recognition 3M Post-It App and converted into Excel spreadsheets. All of these digital formats were uploaded into the qualitative data analysis software NVivo 12 which was then used to organise the data into a thematic analysis by the workshop leader.

[7] Produced using wordclouds.com

the relative sizes of words/phrases are an indication of the frequency with which they occurred in discussions.

Figure 1 Word cloud representing frequency with which certain obstacles and enablers of IDR/TDR arose in discussions.

Of the 25 factors identified by the literature review, the following were not recorded during workshop discussions: Academic tribalism; Cognitive; Interactional; Mutual Ignorance on collaboration; Non-epistemological values; Objectivity – subjectivity.

Constructing and de-constructing research calls

Much of our discussions focused on **the use of language in the call texts**. The calls reviewed were seen as **very instructive (rather than questioning)** with significant use of imperatives. Calls were seen as too rigid and prescriptive. There was a perceived need for language that opens up the topic rather than closes it down and that focuses on what kind of project might meet the challenge rather than on desirable solutions/outcomes.

Current practice was felt to signal a disproportionate influence of economists/business schools. The one mention of social aspects that was included in the sample we looked at was considered to make **tokenism** not only possible but likely. As one specific criticism, artists were always asked to come in to translate, facilitate, "make things pretty" or to act simply as a broker or facilitator without the expectation that they would conduct research themselves.

This critique of the call texts led to discussion around the **expectations** raised by the use of language. Calls were seen as speaking to governments (and demonstrating wise spending of resources) rather

than to academics. The **lack of openness**, where so many aspects of the research project were predefined in terms of the scale of the research or what partners should be involved, was felt to leave little room for AH.

There was widespread criticism that these calls were too "**instrumental**": the requirement for **impact** implies change in a context where economic growth and increased investment are taken for granted as positive outcomes. This led participants to query how we define an impact and whether impacts are always positive? Such language assumes that technology can solve the challenges but ignores the human questions. The language currently used makes assumptions, e.g. referring to cultural heritage as "assets" which automatically monetises rather than considers other forms of value. Word choices reveal particular positions. Calls were couched in technical, social science and economic terms. Such technocratic framing drives people away and means that notions of the social, culture and power are absent.

This approach was interpreted as a **lack of trust** in researchers, undermining their ability to identify problems, users, proper impacts. Indeed, many of the required outputs were not possible for AHSS researchers with outputs instead being framed in the expectation of an ecological or economic perspective in some of the texts that we reviewed. This was interpreted as a "science over culture approach" and the overarching view was that the scope of such calls was too narrow, assuming a solution.

AH was seen as being treated as a "**compensatory presence**" instead of having a role in defining research agendas in a way that builds on the epistemological strengths of AHSS. Research funders were urged to "make room to ask the bigger question" and imagine a different set of calls where AHSS rather than STEMM is the starting point, rather than "a corrective, addendum or supplement". Could we imagine a world where calls are AHSS-led and the language makes accommodations for STEMM?

AHSS or – more specifically in the language of the European Commission – SSH, was seen as being one entity rather than a spectrum of different disciplines. We were reminded that we need to view AH and SS separately, particularly as their research methods can be significantly different. Calls that did favour projects that include SSH invariably required an economist or maybe a political scientist or pol-icy researcher but rarely an AH partner. Participants thus foregrounded the danger of amalgamating AHSS together (and thereby provided further justification for our choice of focus on AH for this Learning Case Workshop).

The language used could be more inclusive, accessible and jargon free. Seeding call texts with strategically inserted words could help flag otherwise overlooked aspects of the call, for example for

re-searchers interested in gender. Quite explicit language that welcomes research combining IDR/TDR approaches "inclusive of AH" resulting in projects that challenge the prevailing narrative and assumptions would be welcomed. The importance of **call titles** should not be overlooked as they immediately begin to frame expectations, for example consider the difference between "building" and "imagining" in a title or the inclusion of a word such as "value" which might signal concepts that act as an **entry** point for AHSS. (There was also recognition that certain language – e.g. "imagination" would not play well in government/policy circles where value for money is a concern.)

To appear more inclusive for AH, call texts could specifically welcome **diverse ranges of methodological approaches** from applicant teams. This might include <u>but should not be limited to</u> creative forms of public engagement and outcome dissemination. For example, an oral history approach can be a means to access alternative narratives.

What AH seek is opportunities for curiosity-led rather than impact-driven research but H2020 is inherently challenge led, requiring very specific impacts often related to the competitiveness of EU industries. These **calls are perceived as working at the service of the nation-state or an EU body and need to be more open if they are to attract the interest of more AHSS researchers**. Unsurprisingly, this may ex-plain why SSH is much more successful in the ERC competitions.

In summary, AH don't like the questions being asked: "EC expects us to deliver answers. EC should be asking AH to devise the question". To facilitate this, AH researchers have a role in helping funders to propose the right questions and manage the right expectations to drive behaviour, as discussed be-low, but achieving this may require further capacity building within the AH community.

Capacity building

It was acknowledged that there are ongoing and long-term debates around achieving culture change within academia. The social sciences had started to engage earlier in these discussions but the experience (and hence expertise) of AH of IDR/TDR is lower. So, in the absence of funders changing, how do AH grasp the nettle and communicate their added value?

While the AH clearly have the **competences**, it requires **confidence** and a **sense of security** to articulate the value that these disciplines bring to IDR/TDR. It needs encouragement and requires people to act as advocates. It requires researchers to be **entrepreneurial** and to see **opportunities** that may move us from our comfort zones. It also requires **tenacity** and **a willingness and ability to subvert calls to AH interests**. This led others in the audience to argue that it was not insecurity but the fact that AH do not like the questions being asked. The environmental humanities are already doing IDR/TDR within/across AH disciplines and we were reminded that an individual can conduct interdisciplinary research on their

own, not only in a collaboration involving STEMM. Nevertheless, the concern was voiced about the risk to funding if AH seem uninterested in interdisciplinary, collaborative research.

When contributors spoke about their **motivations for undertaking IDR/TDR**, they reminded us that encountering different kinds of literature and approaches can reveal important new insights and lead one to become a more versatile scholar with a wider academic network. Others noted that they would never have arrived at their research findings without working across disciplines. The downside was that they **may feel uncomfortable having to simplify their work for policy** and may find it difficult to reach policy audiences. It was suggested that Humanities students and scholars (in contrast to those from the social and natural sciences) are not taught sufficiently about the policy process and when and how to contribute. **The ability to communicate the value of AH research requires AH students and scholars to benefit from greater knowledge exchange and media training**.

Some of the discussion of the **institutional challenges** that early stage scholars encounter when trying to pursue IDR/TDR reminded us that it is still hard to pursue an IDR/TDR project through the rigidly disciplinary **structures of universities. This is especially true at examination (viva) stage (for both the candidate** and the examiner). Indeed, it was suggested that a panel system would be better for IDR/TDR PhD examinations, possibly similar to the US system to give continuity with examiners. Even despite the privileges of funding, setbacks at the early stage of one's IDR/TDR career can be a blow to self-confidence and mental health. These aspects point to much **more widespread institutional issues related to the pro-motion of IDR/TDR** and questions about when is the right time for an individual to "become" interdisciplinary, that **go beyond the EC encouraging greater participation in interdisciplinary grant calls**.

These aspects of the discussion also highlighted the **role of national funders in building capacity**. At the UK level, for example, smaller British Academy awards often lead to future awards in AHRC-funded humanities space. Likewise, the AHRC Connected Communities programme provided small grants that kept building on each other, particularly supporting early career researchers. These smaller grants mean that funders can afford to take more risks and invite "edgy, unexpected work". The Irish Research Council has similarly tried to build a funding pipeline so that researchers are better prepared to apply for EU funding. Some national funders are seen as particularly effective in aligning national funding with EU funding (the Dutch were cited as an example) but at the same time, do not want to be seen as too instrumental and need to leave money for curiosity-led research.

While national funders can lay the ground-work in terms of capacity building for IDR/TDR through, for ex-ample, small network grants, the **lack of articulation between national and EU funding** is exacerbated by pragmatic issues such as different funding cycles resulting in different time horizons for national funders and the EC.

Ways forward

Writing the call

How calls are set up is critical to promoting the inclusion and integration of different disciplinary perspectives. Participants agreed that trying to "shoehorn" AH into already defined technology-led calls was the wrong approach; the result is that AH will always look like "an add on". Instead, a **co-creation approach** involving a wide variety of different disciplines would help to identify priorities, ask the right questions, and avoid inherent contradictions within call texts. This requires changing how we con-struct calls for proposals at a fundamental level so that AH is more involved in setting the research agenda. Instead of assuming that technology can solve the problems, these challenges should be open for discussion around, for example, adoption, uptake, diffusion of technology and these are "hu-man questions". Participants talked in terms of drawing in "ecosystems of thought" to address multi-sector interdisciplinary challenges. **The goal should be an equitable, mixed disciplinary team for design and evaluation** (see below). There was also recognition that this aspiration may be more difficult to achieve than it looks as: (i) AH is less familiar with research co-production and (ii) this requires a change in culture where the EC acknowledges that, although there may be "a received story", they are also willing to welcome projects that challenge this.

In summary, the workshop exercises **raised awareness of the importance of being involved in helping to write the calls**: this places the onus on the AH community to get involved in defining calls and on funders to facilitate this.

Application process

Crafting an application is a significant time commitment, a **two-stage application process involving an initial, blinded outline, followed by an invited full proposal, may encourage more risk-taking**.

Calls should be **more welcoming of multiple different methodological approaches**, as noted above, and in particular **could permit supplementary visual materials**. Currently, submissions are often constrained by the online application portal which may exclude certain forms of AH research.

Support mechanisms

Attracting a greater diversity of disciplines requires a willingness on the part of both funder and applicant to do some **interpretive work** on the call. Do academics lack skills in reading and interpreting call texts and would annotated call texts help? AH may need a mediator/translator in the process of navigating funding calls. Helping people to view call texts differently and understand how AH interests might fit is a key role for university research offices and National Contact Points (NCPs). However, there

was also a recognition of resource constraints and the fact that NCP provision varies at the national level, depending on the size of the member state and research capacity, likewise with the re-search office support that individual universities are able to provide.

Other suggestions of support mechanisms included:

- Illustrative examples/case studies that invite AH participation

- In addition to Net4Society promoting SSH focused calls, including keywords or annotations with the call texts would further help those from a variety of different disciplines to access calls of interest

- Seed funding to enable stakeholder engagement to build collaborations prior to writing a grant application

Refining peer review processes

Innovative IDR/TDR proposals need suitable evaluators. It was acknowledged that it was difficult to get the right people for evaluation. Peer reviewers for IDR/TDR proposals need to have demonstrable interdisciplinary expertise (not just experience). Panel Chairs for such proposals must understand the IDR/TDR nature of the call, have academic expertise in IDR/TDR and experience of chairing a cross-disciplinary, cross-sector panel: "a really good chair needs to have a firm hand to make sure that everybody's voice is heard, so that people are not advocating for their own methods as the only valid ones". Related to this point, is was suggested that **remote evaluation,** rather than a face-to-face panel discussion, might strengthen the AH voice. This might lead to less adversarial encounters where the AHSS reviewer feels like a lone voice on a panel.

All of which **requires academics to sign up as reviewers** and this reveals a problem of numbers - there are **too few AHSS academics in a crowded evaluation space**.

A more refined **keyword system to guide evaluator selection** was proposed so that AH keywords can be identified in a more fine-grained way to avoid proposals being reviewed by inappropriate evaluators (see comments above about heterogeneity of AHSS).

Given that the EC is moving heavily towards research that favours end results and "impact", there is a risk of hard-line economic bias in the review process, making other AHSS contributions even less visible. This requires further consideration of how to provide more **objective evaluation criteria for re-search process, not just impact**.

Other suggestions to improve IDR/TDR peer review included:

- More co-production of call followed through to evaluation: some scholars have already written about the need for IDR/TDR evaluation to become more collaborative and interactive;

- Possibility of responding to proposal reviewers or at least to inappropriate panel allocations ("a right of reply" stage);

- Recognising the difference between AH and SS scholars when populating a review panel;

- Inclusion of non-academic stakeholder representatives on review panel;

- Improved guidelines for reviewers, for example on methods used in different disciplines;

- An indication of review criteria included in call text.

3.3 Turin workshop report: Transdisciplinary education for urban sustainability Workshop Objectives and Activities

This SHAPE-ID Learning Case Workshop held in Turin (17-18 February 2020n) developed in collaboration with the TrUST research platform[8], brought together researchers and experts from academic and non-academic institutions working in the field of Education for Sustainability (EfS). The objective of this workshop, which took place over one and a half days, was to explore what kind of inter- and transdisciplinary educational tools and approaches can support and improve sustainability in the realm of urban transformations. By bringing attention to the combination of two increasingly relevant issues, education and urban sustainability, we wanted to explore how methods and practices of education for sustainability can support synergies between Arts, Humanities and Social Sciences (AHSS) and Science, Technology, Engineering and Mathematics (STEM) perspectives in inter- and transdisciplinary research projects.

Our focus on Education for Urban Sustainability was motivated by the fact that the nexus between the educational process and sustainable urban transformation is potentially highly impactful for the concrete realisation of the United Nations (UN) Sustainable Development Goals (SDGs) 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

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[8] See note 4 above

governance emergencies, and this will require consolidating the cooperation between educational institutions and urban stakeholders – the ultimate aim of EfS agendas.

The workshop opened with two short "scene-setting" presentations to introduce the SHAPE-ID and TrUST projects, share the scope of their collaboration and present the aim of the two-day workshop. This was followed by an initial set of keynote presentations from invited international experts focusing on new learning paradigms in EfS, from primary school to university campus level. The main activity of the first day of the workshop was a writing session, where we asked participants to define their experiences of inter- and transdisciplinarity, the SDGs, process, method and lessons learned in implementing EfS. Participants were also asked to describe obstacles and barriers, as well as triggers and enabling factors, which influence inter- and transdisciplinary education for sustainable urban transformations. On the second morning of the workshop, participants split into smaller working groups to engage in co-design activities around the development of mission-oriented projects.

International keynotes presentations

Dr Jo-Anne Ferreira - Pedagogies and system change in higher education curricula

Dr Jo-Anne Ferreira (La Trobe University) introduced the underlying pedagogical principles of Education for Sustainability (EfS), the fundamental methods for embedding EfS in universities, and how the system change model has been implemented in practice.

Focused on what students can do with their knowledge, Education for Sustainability is a value-oriented holistic approach, centred 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. A system change model is applied by developing partnerships envisioning a new map of the educational system, sharing, and generating new knowledge and information, and implementing action research based on reflection and action for change.

As a model intended to create change within a system, it is likely to encounter barriers in pursuing implementation. Nonetheless, Dr Ferreira concluded by stressing the importance of monitoring the process of implementation, ensuring the achievement of goals previously set.

Dr Julie Davis - Interdisciplinary Early Childhood Education for Sustainability

Dr Julie Davis presented two examples of practices and process from Early Childhood Education for Sustainability (ECEfS): the Lone Pine Project and the Transnational Dialogues network.

The Lone Pine Project is an interdisciplinary collaboration between Early Childhood Education teachers and Design students (architecture, urban design, landscape design) to figure out the key issues and problems, and design jointly a day centre on a pilot community site. This process made it possible to explore new notions of teamwork across disciplines, understand and respect the skills, cultures, and perspectives of each participant, and reflect deeply and critically on real-world issues.

The transnational Dialogues is an international network of researchers in ECEfS that seeks to build coordination capacity and networks, overcoming the isolation of "marginal" researchers. During the project, researchers discovered that despite sometimes being inept at considering linguistic and cultural diversity, they were able to constantly evolve thanks to the ongoing exchange with peers.

Dr Davis concluded highlighting the positive impact of inter- and transdisciplinary work in dealing with "wicked problems" and the abundance of lessons to be learnt from past activities and research.

Drs Maria Alvarez - Liberating pedagogy: learning inside of complexity and uncertainty.

Drs Maria Alvarez presented an innovative educational methodology included in the Global Project and Change Management Bachelor's degree programme of Windesheim Honors College. The learning process addresses features of the contemporary world - volatility, uncertainty, complexity, and ambiguity (VUCA) - and prepares students for future roles as change agents and value creators. During one semester, students develop essential skills in four fundamental areas for contemporary challenges: civil society, global health, social entrepreneurship, and urban dynamics. The 4E-model helps students to structure the process of managing complex issues through four steps:

1. **Explore:** Students and other users of the model are invited to investigate the challenge by analysing the context, probable causes and solutions.

2. **Engage:** Participants map the networks and identify stakeholders who can be key players in addressing the complexity of the challenge.

3. **Elaborate:** strategies to solve the problem are defined by shaping the role of each network and stakeholder and defining the activities that they should undertake.

4. **Evaluate:** As a final phase, students define which value will be created for whom and how it will be evaluated.

The Value Creators concept gauges the progress of experiential learning, navigating across different knowledge boundaries and self-reflection skills that should be embedded in academic curricula. It is a building block, preparing students for going outside the university, in the working and social environment.

Writing Session

At the beginning of the writing session, we asked participants to define their experiences of inter- and transdisciplinary education to pave the ground for a co-creation process, which requires mutual knowledge and understanding. The following questions were asked to comprehend in-depth participants' expertise and detect potentialities inherent to inter- and trans-disciplinary educational processes.

- Would you define your education activity as ID/TD? If so, why?

- Which SDGs you can map your activity on?

- How do you make ID/TD Education happen? Which methods, tools and tricks, team building you put in place?

- Do you have prior experience in working in this way?

- Did you take learnings from those earlier experiences?

- What are the barriers you encountered in ID/TD work in education?

- Could you tell us examples in which these barriers made a project/an action fail?

- What could be a trigger/enable ID/TD education for a sustainable urban transformation?

- Could you tell us a story about your case of success or failure?

Different answers, perspectives and narratives have been synthesised, integrated, and elaborated in the following sections to understand inter- and transdisciplinary educational processes and their roles in supporting sustainable urban transformations.

Defining educational activity as interdisciplinary and transdisciplinary

Interdisciplinarity

Workshop participants defined interdisciplinarity as the process of combining knowledge, integrating different disciplines, and merging diverse perspectives. Interdisciplinarity should be supported by an

explicit and solid willingness on the part of all collaborators to work towards a common goal by redefining and reframing the problem, as well as potential solutions.

Transdisciplinarity

Transdisciplinarity has been described by participants as the integration of academic and professional theories and methodologies with citizens' and civil society organisations' perspectives into a reflective process and challenge-based learning. The aim of transdisciplinary education is the co-creation of positive actions and benefits in terms of social responsibility and sustainability. The natural force of innovation pushes this process, while the power structure and administrative requirements often limit it. For this reason, evaluation is fundamental to enrich communication of both successes and causes for failure.

After they had defined their educational experience as inter- and transdisciplinary, participants mapped their activity onto the SDGs. They were asked to flag which of the 17 SDGs were more relevant and related to their own research activity, and Figure 1 below shows the result of this exercise. The size of each SDG is proportional to the frequency with which the participants cited the SDG (for instance, SDG4 Quality of Education was cited 13 times, while SDG2 Zero Hunger was mentioned only once[9]).

Figure 2 Mapping SDGs in participants' activity

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[9] The total number of workshop participants was 23, but each of them mentioned numerous SDGs correlated to their activity. The total observations were 78.

Not surprisingly, the most cited SDGs are Quality Education, Sustainable Cities and Communities, Climate Action, Gender Equality, Reduced Inequalities, and Responsible Consumption and Production – all SDGs that are transversal and cross-cutting – while those more sectoral, concerning specific environmental and social goals were less cited.

Implementing education for urban sustainability

The development of inter- and transdisciplinary education

The multiple paths and processes for the implementation of inter- and transdisciplinary education, like shaping the vision and long-term goals of universities or identifying real cases for analysis, have to benefit from each other to realise a meaningful transformation on how topics will be taught and developed.

As we describe in detail later in this report, the structural organisation of universities, especially humanities departments that are epistemologically and conceptually past-oriented to consolidated disciplinary knowledge, 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. However, the **universities' strategic plans** can be a leverage point for improving 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 transdisciplinarity education programmes.

Workshops and other methods for **collaborative exchange** are the ideal 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 in academies.

These conversations and connections are catalysed in courses and classes where students can develop transversal knowledge that is able to cater to different interests and be helpful to a specific cause, such as sustainability. A dynamic **joint session with professionals from other disciplines** helps students to develop critical discussions and clarify conflicting perspectives and divergent stakeholders' positions. For example, the objects for student analysis can be challenges already identified by interdisciplinary teams composed by a diversity of experts. Students are 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 to create collaboratively a new scheme for framing the topic and finding a solution.

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. Figure 2 briefly illustrates the myriad of methods, tools and tricks mentioned by participants as useful supports to implement education for urban sustainability.

In conclusion, practical examples and best practices capable of adding value to subjects of an academic course and tangibly enriching students' mind can advantageously support the process of transforming vision, methodology and the structural content of educational institutions.
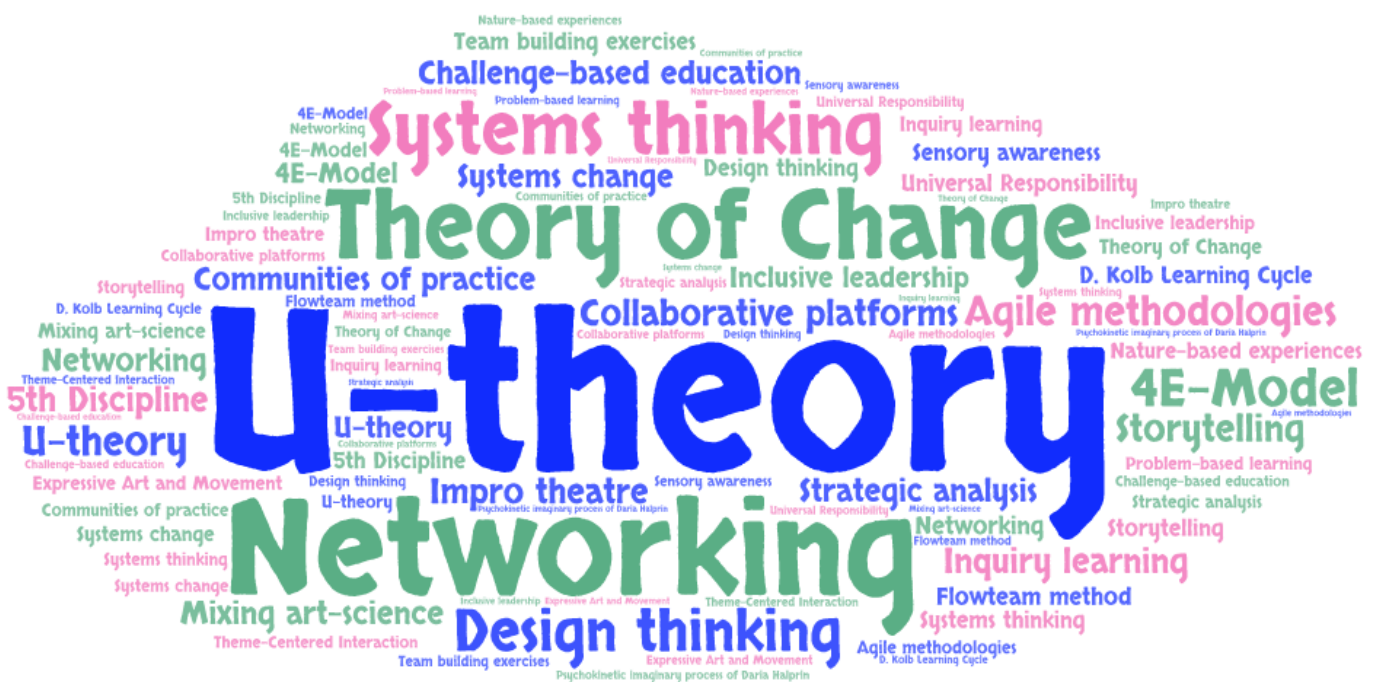

Figure 3 Methods, tools and tricks of inter- and transdisciplinary education

Prior experiences in inter- and transdisciplinary education

Inter- and transdisciplinary education cannot be taught just theoretically. It requires deep and wide first-person experimentation to explore and digest the multiple facets of the process.

The vast majority of workshop participants agreed on the necessity of a learning-by-doing approach in designing interdisciplinary educational programmes, for example, by engaging students in scenario-based learning to co-create continuing storytelling. Project-based education is particularly useful to overcome the challenges of teaching inter- and transdisciplinary to large numbers of students, allowing them to deal with real problems and to work with different stakeholders and disciplinary perspectives.

The validity of the learning-by-doing approach in inter- and transdisciplinary practices has been tested several times in both creative and analytic processes, as Cultural Studies and production of audio-visual materials, as well as in the evaluation of impacts.

The practice of inter- and transdisciplinary education reaches the peak of its realisation in innovative educational concepts and counselling activities for transformative learning. One holistic teaching approach to address tricky challenges and generate agents of change mentioned by a participant is called Value Creators. More than a new educational concept, this method creates an environment where students work to build societal values by connecting with academic communities and stakeholders' networks around the world. Furthermore, some workshop participants briefly described their counselling activities to enable transformative processes, like supporting individuals and groups in their transition towards more sustainable and meaningful living and working, fostering constructive inter- and transdisciplinary collaboration in the academic field, and building facilitation and management competencies with enterprises.

Lessons learned from experts' practice

Inter- and transdisciplinary education is a complex undertaking that requires the application of different methods according to specific audiences. In this respect, multiple lessons and suggestions were drawn from this workshop session. The key points can be synthesised in the necessity of **having a structure** and creating a safe space to manage a process that is much more difficult than the traditional teaching method, demanding more workload, but on the other hand, ensuring better and more durable results.

Paradoxically, such unstructured learning experiences need clear and defined structures for the collaboration, especially when students and extensive networks are involved. The leader of an inter- and transdisciplinary process has to master a comprehensive toolbox to orient participants clearly, defining expectations and maintaining levels of interest and engagement through a solid and trustworthy leadership style. Trust is a crucial factor to build and feed a learning process that brings participants out of their comfort zone, changing their priorities and deconstructing their worldview to face the limits of their knowledge. **Staging a safe environment** is a prerequisite to enable experimentation, self-reflection, transformation, and a productive team building, which requires a lot of time.

Additionally, participants shared useful recommendations for implementing transdisciplinary projects smoothly.

- In a co-creation activity that involves many stakeholders and citizens, specific attention should be paid to the representativeness of social groups engaged, as well as the transparency of the process and its social legitimacy.

- Continuous monitoring during the project implementation should be planned, ensuring institutional sustainability and constant communication with all actors involved.

- Finally, social innovation prefers less regulated environments to enable multiple facets and unpredictable developments to emerge from the process. As described in more detail below, the traditional university is considered a possible obstacle to this.

Obstacles to implementing inter- and transdisciplinary education

Workshop participants delivered several narratives, outlining numerous hindering factors in the implementation of inter- and transdisciplinary education. Obstacles can be synthetically categorised as financial limits, leading to limits of time and space; organisational structure of universities; peer relationships; cultural aptitude and students' perspectives. We present the barriers discussed as a sequence of causes and effects in order to delineate a possible solution to the causal circle.

Primarily, universities and academic institutions have an inevitable **financial limit** that often results in unsuitable places and tools as well as constraints on the most precious resource, personnel time. The working time of staff and teachers is a critical factor because of the additional workload required by inter- and transdisciplinary educational activities, which have to be adapted to different groups of students. Moreover, the increasing involvement of temporary and part-time staff intensifies the difficulty of engaging them in such a complicated and experimental process.

The financial issues and their administration are strictly correlated with **university organisation**. Firstly, the academic structure is based on **disciplinary divisions**, and then funds are distributed according to the number of students enrolled in each faculty. The competition between disciplines and colleagues strengthens divisions, and a common space for inter- and transdisciplinarity is missing. A transdisciplinary programme, for example, has to be integrated into a faculty, reducing its activities and ambitions. A university structure based on disciplines, besides determining programme contents and increasing *silo thought* in all actors involved, defines the criteria for the assessment and recruitment of researchers and teachers.

An evaluation mechanism that does not value inter- and transdisciplinary practices discredits the ID/TD knowledge produced and reduces the possibility of involving colleagues to support the process actively. The university *milieu* is predominantly characterised by a **self-referentiality** and interest in preserving

its own disciplinary structure, and this undermines the flourishing of skills for collaboration and facilitation, as well as the development of "outside-the-box" thinking.

The **extreme reliance on "expert knowledge"** risks limiting more active learning through the involvement of external stakeholders and non-scientists, such as citizens, in research projects. If the benefits of a problem-based educational approach are not recognised, the space for integrating different perspectives in a common understanding is squeezed, amplifying the gap between inter- and transdisciplinary theories and practices.

The consequences and effects of this vicious circle on scholars are manifold. Firstly, students that most of the time still have to learn to trust in themselves are highly exposed to the risk of getting lost among too many perspectives without acquiring an in-depth knowledge of the specific subject. The teacher has to deliver a clear, precise and concrete learning process to meet students' expectations and orient their curiosity-driven learning. The significant **scarcity of transdisciplinary training opportunities** and best practices hinders a consistent integration of disciplines, and the students' aspirations to apply theoretical notions to solve real-life problems are often left unattended.

A concrete, detailed and practical framework for implementing inter- and transdisciplinary projects, together with an evaluation and monitoring system able to capture their benefits, could change the parameters behind the allocation of funding and overcome the effects of hindering factors.

Examples of barriers in inter- and transdisciplinary projects realisation

A project for the promotion of the restorative justice approach has implemented co-design methods for content creation and active learning through gaming, informal teaching, and job opportunities for training secondary teachers, in three school settings. However, the project failed, especially in one school, mainly because teachers, in particular those specialised in hard disciplines (Maths, Physics), expected a standard toolkit for restorative justice that they could have used in their teaching activities. The experts' invitation to co-create the toolkit interactively during the training was perceived by teachers as a lack of knowledge, reducing their trust in the process and methods introduced by the project. Furthermore, teachers, in particular those specialised in the natural sciences, did not recognise as relevant the core concept of the method, namely the necessity of taking care of students' relations and their emotions as well as adopting a participative approach for conflict resolution. Teachers did not implement the restorative justice approach adequately, and in the end, the school abandoned the project.

The attempt to create a new academic course in one University on Global interdisciplinary and comparative perspectives was significantly reduced, leading to the failure of the original project. The initial plan was to mix humanities, art, social sciences, juridical and health disciplines, but the final course is basically a history degree. The interdisciplinary options have been hidden or eliminated from the flexible academic path offered to students. Even if the council has not yet discussed the contents of the programme, the result is substantially different from the original idea.

Enabling inter- and transdisciplinary education to trigger a sustainable urban transformation

A combination of factors, like specific competencies, real cases for analysis and implementation, personal motivation and structural incentives, and best practices for dissemination, have to act synergistically to support a sustainable urban transformation.

Urban sustainability is a multifaceted issue, and **specific competencies** – like creativity, system and critical thinking, and the mastering of intricate knowledge in several areas – are required to tackle complexity. A systemic approach should be implemented by asking students to define the research question in interdisciplinary terms and providing them with the necessary tools for a criticism of the emotional overload surrounding a topic like sustainability. This process introduces functional and transversal skills into technical and specialised courses, moving beyond the distinction between "hard" and "soft" skills and acknowledging the value of both types of competence for creating sustainable societies.

Methodologically, the passive transmission of knowledge becomes **active learning**, where learners are decisive actors in the educational process. It also implies preparing students and especially teachers to be coaches in the learning process, with the training of transdisciplinary facilitators being duly acknowledged. A sort of new "transdisciplinary scientist" profile (see box below) should master a number of competences and skills that all together are required to link the world of science (universities) and the world of society (civic actors). The consolidation of this link is a crucial element to enhance the quality of higher education and ensure its impact in terms of the SDGs and the 2030 Agenda for Sustainable Development, and it should be considered a fundamental requirement for top ranked universities.

The dialogue between universities and municipalities will allow finding **real-world problems** for applying action-based research and implementing transdisciplinary approaches. The involvement of external actors engenders an informal space for learning, which is particularly useful for students that become

aware of the multiple roles and aspects embedded in transdisciplinary practices. The acknowledgement of concrete urban challenge, especially if institutionalised through a compulsory phase in any academic curriculum, will generate in involved actors a feeling of owning the problem and an urgency to act, incentivising then institutions to change. The ten-year project at Campus Kindergarten in Brisbane called Sustainable Planet is evidence of this process, considering that besides the initial topic of water conservation, the project is currently also addressing energy consumption, waste management and climate change mitigation issues.

Enabling inter- and transdisciplinary education for supporting a sustainable urban transformation requires a **systemic activity** drawing on specific competencies like those previously described, to cope with real urban challenges, to design various incentives and the dissemination of constructive narratives. In this learning process, citizens, that were previously dissociated from their own urban spaces, delegating their management to others, begin to feel responsible for and engaged with their own city. **Ensuring cities belong to citizens** is the critical step for achieving a space where it is possible to live pleasantly for a long time.

How to profile a "transdisciplinary scientist"[10]?

The participants of the Turin Workshop remained in contact after the workshop, with the aim of forming a transdisciplinary experts' community.

An interesting follow-up discussion concerns the definition of the profile of a "transdisciplinary scientist", recognising the peculiar capacities and features of a transdisciplinary researcher and educator as opposed to a disciplinary profile. Nikki Brand – one of the keynote speakers at the workshop – picked the collective brain of the embryonic ID&TD community with an e-mail asking:

"What should we call a scientist in a research program, who: can be (1) part of matchmaking between societal partners and the researchers, (2) who record the substantive findings and ultimately create a synthesis, (3) and monitor the performance of particular learning strategies (3)? They should not be 'mere' facilitators, but scientists who do not feel limited to a single academic discipline and can connect the dots between different academic deliverables."

How to capture this profile in one word? A discussion started and at the moment of writing is ongoing. One aspect emerging from the discussion is the association of the concept with the capacities this profile should demonstrate of navigating across different boundaries of specific fields of knowledge (scientific or practical), without being lost in deep disciplinary details, but at the same time keeping necessarily robust knowledge foundations while making a transdisciplinary synthesis.

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[10] Kaså S. and Pohl C. Methods for transdisciplinarity and how to use them. Joint keynote at the International Transdisciplinarity Conference, September 10-13, University of Göteborg, Sweden. To learn more about the question of integration expertise look also at Gabriele Bammer's work and blog (https://i2insights.org/).

"Boundary freedom" is one name for this capacity. A nice description of it came out from one of the participants (Ruth Foerster): "*I want to draw special attention to the middlemen and facilitators who acted as the human equivalent of boundary objects. Intermediate persons allow for a mediation between the heterogeneous worlds of science and practice along with current and new (cutting edge) practices. In both cases, actors from both sides were able to take this role and facilitate communication or negotiation between the two groups, e.g. by clarifying discussion. Most of these people had experience in both worlds and thus were not neutral or outsiders concerning content the way most moderators are expected to be but could switch roles and sides. In that way they were able to live in both worlds and mediate between them. In particular, practitioners functioned as gatekeepers and multipliers of scientific knowledge production in their practice.*"

Cases of successful urban sustainability transformation

Ersilia Foundation is part of the Building Urban Intelligent Living Design Solutions (BUILD) project. This European project brings together architecture, biotech and economic specialists coming from both academia and the business sector. The interdisciplinary team has co-created a semester-long programme where students coming from the three different disciplines have to work together to design new solutions for urban environmental challenges. Several groups have been formed, and they are working on innovative artefacts and solutions that will be presented to investors. Students are very grateful to have this opportunity that is intensely stimulating and engaging for them.

The inter- and transdisciplinary programme at the University of Bale called Mankind-Society-Environment had been successfully reformed (in 2001-2002) to address a problem with training projects for students. Previously, the students had to tackle complex, real-world issues in groups up to 15 during a 1-year course. In the end, they had to present their results to the problem-owners, teachers and academic audience composed of experts on the specific topic. The quality of the project reports varied widely and the problem-owners (external organisations) were not always satisfied by the contents of the deliverable because they expected reliable scientific results to be used in practice. Also, teachers were not satisfied since the reports did not meet the high-level academic standard. At the same time, students were frustrated since they put a lot of effort into the project without having positive feedback.

The reform of the programme introduced:

- a sound introductory part where problems and methods to apply have been framed;

- co-teaching to train teachers for this innovative approach;

- basic courses for students and teachers on project management, team communication and development;

- contracts with problem-owners for managing their expectations.
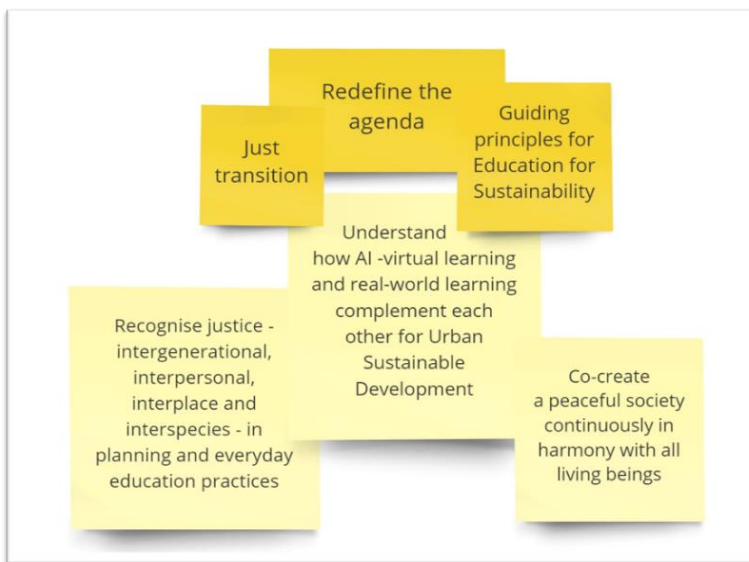
Mission-Oriented Research Co-Design Activity

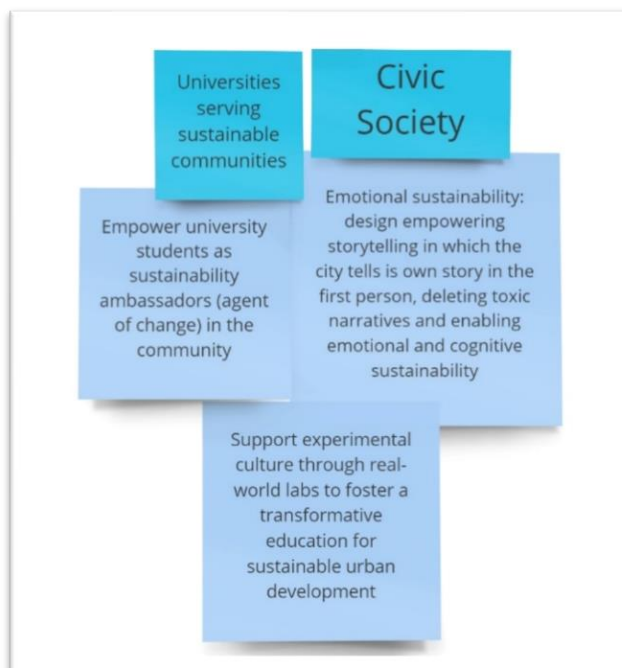*Figure 4 Redefine the Agenda challenge*

Dr Carlo Sessa presented the Mission-Oriented Research Co-Design activity, facilitating a brainstorming activity to crystallise the challenge of fostering inter- and transdisciplinary approaches for a sustainable urban transformation. At the end of the first day, participants were invited to look at the workshop group as a community. On the morning of Day 2 they arrived at the workshop with a fairly clear idea about what we can collectively generate within the next 3-5 years. All participants described how they had glimpsed the challenge and different aspects of the process. Numerous input and narratives have been clustered into three broad areas of challenge: redefine the EfS Agenda (Figure 3), universities serving sustainable communities (Figure 4), and change from within the university (Figure 5).

Figure 5 Universities serving sustainable communities

Figure 6 Change from within the university challenge

Three groups were formed after clustering the brainstorming outputs (individual post-its). Each group than worked to, co-design a mission, with the identification and definition of a path to achieve the challenge. The activity involved the following steps[11]:

1. **Define a Mission Statement** that substantially contributes to education for urban sustainability through a bold, inspirational and with a broad societal relevance goal. The mission has to be cross-disciplinary, cross-sectoral, and with the involvement of multiple actors; ambitious yet realistic; targeted, measurable and time-bounded.

2. **Create a stakeholder map** that includes who sets the agenda for achieving the mission, who needs to be involved, influenced and persuaded. During the exercise, participants should also look at the roles played by different actors and which cultural factors should be considered during the stakeholders' involvement.

3. **Outline structures, mechanisms and resources** needed to support the mission implementation, considering if existing ones can be used, adapted or replaced. The result should also contemplate an effective monitoring and evaluation mechanism.

4. **Define potential projects, initiatives, and policy proposals** that can contribute to achieving the mission.

The following sections describe the three challenges and the mission statements drafted by each working group.

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[11] Based on Mazzucato, M. (2018) Mission-Oriented Research & Innovation in the European Union: A problem-solving approach to fuel innovation-led growth. Available at https://ec.europa.eu/info/sites/info/files/mazzucato_report_2018.pdf

Enabling Just and Resilient Active Urban Communities

CHALLENGE

Redefining the agenda towards a just transition through guiding principles of Education for Sustainability

MISSION

Enabling just and resilient active urban communities

Time frame: 20-30 years

STAKEHOLDERS

- Representatives from universities.
- Educators.
- Students.
- Municipal authorities (politicians and administrative structures) that can join multi-departments or steering groups
- Civil society organisations and citizens - neighbourhood councils in Berlin involved in co-design, implementation and evaluation of projects for the neighbourhood.

STRUCTURES & RESOURCES

- Multiple scales, from the neighbourhood to the local, regional, national and European scale (depending on the problem).
- Professional facilitation resources for advancing co-creation.
- Funding for pilot/experiments (research, education, citizen science).
- Strategy and funding for retraining new competences (new academic curricula, reorganisation of municipalities).

PROJECTS

Capacity building: training and facilitators for groups to catalyse missions

Envisioning urban resilience: define its dimensions

Toolbox to support integrated universities, funding and projects.

Review and synthesise successful urban transition processes

Informal learning with and in resilient communities

CHALLENGE

> Civic University

MISSION

> Universities serving sustainable communities

STAKEHOLDERS

- *Healthy cities organisations* like associations and activists' networks.
- Cultural institutions such as museums, art galleries, libraries (neighbourhood).
- School system.
- Sports centres.
- Social entrepreneurs, community centres, religious groups and NGOs.
- Shops and small local business.
- Municipalities and city administrations.

STRUCTURES & RESOURCES

- Platforms for sustainable communities provided by University
- Toolbox/guidebook for social innovation processes (storytelling, collaborative work, co-creation, etc.)
- Providing professional facilitation
- New social innovation models/offices (connect to innovation offices of universities)
- Alumni network involved

PROJECTS

- Develop social innovation model and toolbox to implement in universities and municipalities

- Social Innovation Park & Living Labs, including both STEM and AHSS

- Foster students in visioning and accomplishing a mission in the community

- Introduce the qualitative vision/ way of thinking of arts into cities' narratives

- Multiply events like "Science in the pub"

![SHAPE-ID — Shaping interdisciplinary practices in Europe]

Empower a community of change to reorient HEIs towards sustainability

CHALLENGE

Change from within the university

MISSION

Empower a community of change to reorient HEIs towards sustainability

STAKEHOLDERS

- Administrators, students and professors.
- Local communities working with HEIs.
- Leading external actors with adequate time and space.
- Rectorate group in charge of selecting the team that carries out the process.

STRUCTURES & RESOURCES

- Collaborative process for shared owner-ship
- Policies setting the process as manda-tory
- Criteria that value good teaching
- Inter and transdisciplinary degree to-ward sustainability

PROJECTS

Define new curricula based on a challenge for sustainability

Teach methods and activate training for collaborative processes

Deconstruct the mainstream sustainable labelling and enable new ways of accounting

Awards for "TD champions" from a community of change agents in the existing structure

Re-frame the expectation of students and professors

4   Post-COVID-19 remote learning case workshops

The SHAPE-ID learning case workshops scheduled to take place in Bilbao, Warsaw and Zurich had to be cancelled due to the COVID-19 outbreak and travel and gathering restrictions. The challenges addressed by these last three learning journeys are:

- AI challenges and scenarios of collaborative learning, working and living with machines (LCW4 – Bilbao)

- Streamlining Digital Humanities research and infrastructure in the cultural heritage domain (LCW5 – Warsaw)

- Intersections or reconfigurations? Arts & Humanities integration in inter- and transdisciplinary research (LCW6 - Zurich)

Due to the ongoing and uncertain situation with COVID-19, the SHAPE-ID consortium considered the organisation of in-person meetings no longer feasible and decided to reorganise the workshops in a remote setting. This choice, besides ensuring the protection of all participants' health while reducing further delays to the project, now presents the opportunity to experiment with interdisciplinary/ transdisciplinary learning activities in a virtual environment.

Indeed, despite the adversity, there is a real opportunity to be seized in organising online events. Exploring the potential of online techniques for working and developing interdisciplinary and transdisciplinary collaborations is a necessary step and a critical advantage if we consider that personal mobility and gatherings will not resume at previous levels of frequency and intensity soon. In particular, the role of the Arts and Humanities in this challenge is essential because the technology-driven process of moving meetings online will challenge most of the tacit and emotional aspects of human interaction, as informal and private communication, the emotional effects of collaboration, and all those non-visible elements of the social exchange that need to be considered and influence the outcome of collaborative research.

Organising the remaining learning events in a digital setting will allow us to experiment with different methodologies and to compare the outcomes of in-person and online workshops.

All remaining workshops will take place during September 2020 and reports will be available towards the end of 2020.