Engaging for Sustainable Development and Transformation – Exploring the Concept of Transformative Academic Institutions

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Abstract

Universities are expected to play a proactive role in the sustainable development and transformation of their regions. However, they face external and internal barriers to play that role. One possible approach to overcome those barriers is through transformative academic institutions (TAIs). TAIs are defined as research centres created within universities to proactively engage in territorial development processes and can act as 'living labs' from which universities can draw lessons when developing a regionally engaged role. The article explores the TAI concept further by posing the following research question: How does the TAI approach look like in different contexts? What factors support and/or hinder TAI development? To that end, we analyse

the case of five academic partners working in different organisational research settings within larger university structures. Our exploration of TAI practices followed an action research approach with participatory design methods to identify commonalities, challenges, and opportunities. Findings point to a more strategic partnering with external (non-academic) actors to contribute to (longer-term) change processes that address regional sustainability challenges. This can take universities towards new roles in curating collective knowledge and catalysing and facilitating change.

1   Introduction

Since the launch of the United Nation's Sustainable Development Goals (SDGs) in 2015, we have witnessed an increased focus on systemic action to address societal challenges (developing greener, more inclusive economies, and stronger, more resilient societies). In relation to this, we observe the rise of new concepts and "calls to action" for universities to take on new roles within the Triple Helix to contribute to place-based innovation, sustainability transitions and transformation (Giesenbauer & Tegeler 2020, Aranguren et al. 2021, Cuesta-Claros et al. 2021, Trippl et al. 2023). However, while universities are increasingly being seen as a positive vehicle for territorial development and regional transformation, they face important internal and external barriers to play a regionally engaged role (Aranguren et al 2021, Benneworth & Fitjar 2017, Kempton 2019, Kempton et al. 2021).

Creating challenge-driven research centres within universities has been proposed as a way of addressing some of the barriers the latter face when attempting to play a proactive role in the development of their home territories (Goddard et al., 2013). By bringing together this proposal and their own practical experience, Aranguren et al. (2021) coined the concept of Transformative Academic Institutions (TAIs), defining them as research centres created within a university to proactively engage in the socioeconomic development of their territories. They argued that TAIs could act as 'living labs' from which universities could draw lessons when developing a regionally engaged role.

This paper takes a step further, posing the following research questions, which to our knowledge, have not been addressed in the literature: How does

the TAI approach look like in different contexts? What factors support and/or hinder TAI development? To that end, we analyse the case of five academic partners (living labs) working in different organisational research settings within larger university structures. They all have a shared mission of engaging with local actors in addressing place-based sustainable development challenges.

The partners include: (i) Orkestra, at the University of Deusto, Basque Country, Spain; (ii) Innovation School, at The Glasgow School of Art, Scotland, United Kingdom; (iii) Social and Economic Change Lab, at the University of British Columbia, Okanagan, Canada; (iv) The Competitiveness Institute, at the Faculty of Business Studies, Catholic University of Uruguay; and, (v) Collaboration Office at Lund University, Sweden. The fact that the partners have different organisational structures (from challenge -oriented research centres, to university departments, to groups of researchers sharing an interest in undertaking socially relevant research), makes them interesting cases to understand how TAI approaches can work in different contexts.

Adopting an action research approach, this early-stage, self-initiated research collaboration describes how through an interlinked series of working papers, workshops, and collaborative knowledge building, the five partners progressed towards better understanding of what it means to be a TAI by defining the significant factors, challenges, and opportunities for TAI approaches. The results from this exploratory work point to a more strategic partnering with local actors in order to contribute to (longer-term) change processes that address jointly defined sustainability challenges. Through our findings we further develop the TAI concept and draw lessons for universities wishing to experiment with this approach as a pathway to overcome the internal and external barriers they face when attempting to play an engaged role in the sustainable development of their home territories.

Following this introduction, in the next section we review the literature on the evolving role of universities in relation to place-based sustainable development and position the TAI concept within that literature. In section 3 we explain the approach and methods used. We present our findings in Section 4, followed by a discussion of results (Section 5) and conclusions (Section 6).

2   The Discussion on the Role of Universities in Place-Based Sustainable Development

This section provides an overview of the discussion on the role of universities in place-based sustainable development processes. Our objective is to show

the wide array and rapid evolution of concepts that have emerged since a third mission for universities was identified within the regional systems of innovation literature. This rapid conceptual evolution mirrors the escalation of our many societal challenges and places important expectations on a millenary institution that often cannot (or will not) change at the same pace.

2.1   *The Emergence of Regional Systems of Innovation*

The discussion around innovation and economic growth that emerged in the late 20th Century highlighted the important role that universities can play in territorial development. The discussion was born in the context of the Japanese economic miracle, explained by the capacity of its firms to learn and innovate (Freeman, 1987) and when an innovation gap was identified in the United States' industry due to the rise of competition (Etzkowitz et al., 2000). The national systems of innovation literature explained innovation as a result of a non-linear interactive process among firms, universities and public institutions (Edquist, 1997; Freeman, 1994; Lundvall, 1992; Nelson, 1993), and the regional systems of innovation literature explained different economic outcomes within countries through territorially specific dynamics (Cooke et al., 1997; Morgan, 1997).

In placing universities at the heart of the innovation process, the systems of innovation literature had paved the way for the emergence of new concepts and frameworks aimed at capturing a new role or third mission for universities in addition to the more traditional ones of teaching and doing research. The influential Triple Helix Model (Etzkowitz & Leydesdorff, 1998) identified the intersection of university, industry and government relations as an environment conducive to innovation, with those relations requiring a constant reconfiguration for the production, transfer and application of knowledge (Ranga & Etzkowitz, 2013). In this early model universities developed their third mission by transferring scientific and technological knowledge to firms and industry.

Uyarra (2010) identified 5 different third mission models as they are reflected in the literature according to their type of engagement and contribution to regional innovation: knowledge factories, relational universities, entrepreneurial universities, systemic universities and engaged universities. Similarly, entrepreneurial universities, defined early on as engines of growth through knowledge capitalization, creation of new firms (Etzkowitz, 2001) and by facilitating behavior to prosper in an entrepreneurial society (Audtresch, 2014), were found to play different roles at different levels and to change those roles over time. They can be: (i) growth supporters, through knowledge and innovations; (ii) steerers of regional development by building networks and

complementing other local organisations; and (iii) growth drivers through leadership and their capacity to respond to regional needs (Pugh et al., 2022).

While some universities have had societal engagement missions since their inception, such as the land-grant universities in the United States (MIT, Purdue, etc.), the importance of proximity, highlighted in the literature on regional systems of innovation, intensified pressure on universities to play active roles in their host territories (Aranguren et al., 2016). In Europe, the requirement by the European Commission that all regions develop coherent territorial development strategies (known as Smart Specialisation Strategies, S3), as an *ex ante* condition to have access to structural funds since 2012, has contributed to reinforce the role of universities as key players in territorial strategies for economic growth (Goddard, 2009; Goddard & Pukka, 2008; Goddard et al., 2013; Kempton et al., 2014). Through the Entrepreneurial Discovery Process (Foray, et al., 2011), many universities in Europe have engaged for over 10 years in collaborative multilevel processes aimed at defining territorial strategy. This has resulted in a wide array of university engagement practices that respond to specific contextual factors (Canto-Farachala, et al., 2022). This track-record of collaboration for innovation, if revisited, could contribute to addressing sustainability challenges (Miedzinski et al., 2021).

2.2   *Responding to Societal Sustainability Challenges*
The world's sustainability challenges are listed in the United Nation's Agenda 2030, which includes universities as actors that can work in partnership with others in collaborative processes leading to the achievement of the Sustainable Development Goals (SDGs). The SDG's have been portrayed as an ideal means that can facilitate the transition from universities 2.0, focused on quantitative success, professional specialization and competition, to universities 3.0, which are highly aware of global challenges and societal responsibility and try to integrate different perspectives of regional and global stakeholders (Gisenbauer & Tegeler, 2020). However, while the SDGs provide a shared vision of a sustainable future, there are multiple ways of understanding sustainable development transformations, the role of universities in those transformations and the changes needed within universities to bring them about (Cuesta-Claros et al., 2021). Pluralistic research environments that enable inter- and transdisciplinary approaches are needed (Greenwood & Levin 2007; Bornmann 2013; Karlsen & Larrea 2014; Schneider et al., 2019), which in turn require a new set of incentives that recognize engagement in career progression indicators (Sormani & Rossano-Rivero, 2023; Benneworth. 2017; Watermeyer 2015; Reale, et al., 2017).

In any case, complex societal challenges acquire meaning through interactions in the local context, where universities can contribute to create spaces in which alternative ideas, practices and social relations can emerge to further sustainability transitions (Wittmayer et al., 2014). These are spaces in which to develop a shared language and meanings that can lead to shared agendas for action (Karlsen & Larrea, 2014). A university model proposed for sustainability that predates the Agenda 2030 is the 'transformative university', based on an alternative mission of co-creation for sustainability in a given geographical vicinity (Trencher et al., 2014). Trippl, Schwaag Serger and Erdős (2023) build on said model to propose a regional transformative mission for universities of which some of its characteristics are the following: (i) a function of co-creation for sustainability and transformation, (ii) an objective of contributing to societal sustainability and transformation; (iii) an approach based on open innovation that provides (among other things) comprehensive, systematic responses to several interwoven problems; and (iv) collaboration based on large-scale coalitions with actors from academia, industry, government and civil society.

The sustainability challenge is also addressed by Cai & Ahmad (2023) who propose the concept of sustainable entrepreneurial university (SEU) as an ideal-type university that has evolved from an entrepreneurial university, exhibiting the following emerging shifts: (i) from being key knowledge producers for technology transfer to anchor organizations for facilitating knowledge exchange; (ii) from developing reciprocal collaborations with actors from industry and government sectors to building trust among more diversified actors, including citizens, in innovation ecosystems and (iii) from better serving society's needs to shaping a better future society through fostering institutional changes.

In addition to the sustainability challenge, the decade of austerity that followed the 2008 financial meltdown placed increased demands for explicit evidence of the value of public investment in research and higher education. In this context, researchers are increasingly asked to demonstrate the contribution of their projects to society and the economy in exchange for public funding (Fogg-Rogers et al., 2015; Watermeyer, 2019). The economic consequences of the pandemic and the ongoing wars may exacerbate that trend. This has increased the need to evidence pathways to impact (van den Akker et al., 2017). The so-called metric-tide (Wilsdon, 2016), however, has tended to reinforce an understanding of societal impact based on linear models of innovation and communication (Sivertsen & Meijer 2020) that do not help to capture emergent and multidimensional research processes. A shift from attribution to contribution has been proposed as a way of rewarding the engagement of university research with societal challenges without having to attribute

specific causal relationships to complex challenges (Dotti & Walczyk 2022). Moreover, research can also have negative impacts on society (Derrick et al., 2018; Sigurdarson 2020).

In sum, universities are increasingly seen as organizers and curators of learning, knowledge and thinking, as well as catalysts of change and sustainable development (Trencher et al., 2014; Aranguren et al., 2016; Benner & Schwaag Serger, 2017; Weber & Newby, 2018; Benneworth & Fitjar 2019; Aranguren et al., 2021; Cuesta-Claros et al., 2021; Schwaag Serger et al., 2021; Pugh et al., 2022). They are expected to play a significant role in building productive multi-stakeholder partnerships within their local socioeconomic environment, engaging with firms and other actors to drive sustainable transformation processes.

The aims of these multi-stakeholder partnerships are not only the production and dissemination of new knowledge (research and education), but increasingly societal transformation. However, some authors argue that amid all these expectations, there is a need for a more realistic, honest understanding of the limitations of universities' contribution as local actors in their places, one which does not downplay the internal tensions, the different institutional drivers, and external barriers on their ability and willingness to engage (Kempton, 2019; Kempton et al., 2021). It is also important to consider that the field of evaluation has not yet caught up with the speed of institutional demands and this might affect universities' ability to deliver and evidence true societal impact (Cinar et al., 2023).

In this context, TAIs, that is challenge-oriented research centres created within universities to engage in joint problem solving with local and regional actors, are prosposed as a pathway for experimentation; as living labs from which universities can draw lessons when developing a regionally engaged role (Aranguren et al., 2021: 3). We argue that through their experimental character, TAIs can contribute to a better understanding of the internal and external constraints that universities face when attempting to engage in regional development processes, a knowledge gap identified by Kempton (2019, 2021). Moreover, with an organizational culture that helps to shape the attitudes of researchers and managers in developing a territorially engaged role (Alcalde, et al. 2017) and with a more flexible governance that includes local and regional public and private actors, TAIs could introduce and test new ideas and approaches that can gradually influence change in the wider university structure (Chatterton & Goddard 2000).

The following section explains the methodological approach we followed in order to address our research questions on how TAI approaches look like in different contexts and the factors that support and/or hinder their development.

3   Methodology and Approach

The exploration of TAI practices followed an action research approach (Hult &
Lennung, 1980) – simultaneously building knowledge and supporting practi-
cal problem-solving (or improving practice) through an interactive learning
process between researcher and practitioner. In this case, as we were explor-
ing universities' own transformative practices, the researchers were the prac-
titioners within their organisations, with the focus of the research being the
universities themselves. More specifically, the research involved an iterative
process of cross-case learning between departments/research groups from
the five partner academic institutions on three continents (See Table 1). A
further summary of Partner's territorial and organisational context also can
be found in Appendix 1. This process applied Participatory Design methods to
understand and unveil how the TAI approach translates in different contexts
and to identify common factors, challenges, and opportunities (despite the
diverse contexts), as well as preconceptions and assumptions around universi-
ties' approaches to engaging for transformation (operationalising the regional
transformative mission as described in Trippl et al. 2023). In this Participatory
Design approach, while the project may still start with a question and end
with an answer, the process involves iterative, ongoing interaction and dia-
logue between relevant stakeholders to build upon their primary knowledge
and expertise ('what is') to envisage preferable scenarios ('what could be')
(Steen, 2011) and contribute towards a possible solution (Guertler et al., 2020).
Bringing together a diverse range of people with a shared interest or collective
motivation and supporting them to collaboratively address a complex set of
challenges (Norman & Verganti, 2014) can allow for insights and ideas to be
shared, developed, and applied to inform new products, services, systems, and
experiences that respond to communities' ideas and aspirations (Sanders &
Stappers 2014). Such research is a journey of inquiry, "where direction, conduct
and action are not predetermined, rather they are chosen through observation,
reason and evidence, informed by feeling and sensitivity, as the journey pro-
gresses." (Culver et al., 2015: 205–206).

Among the group of partners, some (Orkestra, GSA and Lund) had worked
together for over a decade on collaborative innovation and cluster policy,
establishing and leading the TCI cluster evaluation working group.[1] Strong

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1   TCI CEWG, part of the TCI global cluster network, brings together researchers, practitio-
    ners, and policy makers to share learning and develop new approaches to better evidence
    the value of collaborative innovation and cluster programmes. https://tci-network.org/tci
    -cluster-evaluation-working-group/#cluster-evaluation-working-group.

TABLE 1   Participating partner academic institutions

Partner	Created within	Location	Research focus
Innovation School	The Glasgow School of Art (GSA)	Glasgow, UK	The Innovation School is a leading centre for design teaching and research that applies Design Innovation to the key issues defining contemporary society. We examine design's role as a catalyst for positive change. Our research uncovers how to frame and create the 'spaces' for such collaborative engagement, bringing together participants' experience to reimagine and co-design implementable solutions, and the identification and implementation of innovative responses to complex issues through an open and collaborative engagement with communities, publics and stakeholders.
Orkestra	University of Deusto	Basque Region, Spain	Through transformative research, Orkestra links global and local knowledge to foster innovative solutions to the challenges of competitiveness faced by the Basque Country. We do so hand in hand with the territorial actors directly involved in those challenges, thereby co-generating actionable knowledge useful for their decision making. The specific goals set out in our mission are: (i) to contribute to improve Basque Country competitiveness, (ii) to promote the improvement of citizen's wellbeing and, (iii) to create knowledge on regional competitiveness.

TABLE 1   Participating partner academic institutions (*cont.*)

Partner	Created within	Location	Research focus
LU Collaboration	Lund University	Lund, Sweden	LU Collaboration is a department within the university's administrative section for research, collaboration and innovation, with the role of promoting collaboration between the university and societal actors. Our work takes its starting point in global societal challenges where the university has a key role to play, together with others, in order to contribute to new knowledge, new solutions and innovations. The department assists with coordination, communication, skills development, action research and other tasks that support the initiation and development of cross-faculty projects and platforms where university researchers or students collaborate with external actors (e.g. companies, municipalities and other public sector actors, research funders and other organizations).
Social and Economic Change Lab	University of British Columbia (UBC)	Okanagan, Canada	In the lab, a multidisciplinary group of faculty, staff and students across UBC focuses on social and economic change in regional, national and international contexts. Connecting diverse perspectives, ways of knowing and understanding, they generate critical knowledge to address complex challenges facing individuals, organizations and communities.

TABLE 1   Participating partner academic institutions (*cont.*)

Partner	Created within	Location	Research focus
Competitiveness Institute	Faculty of Business Studies, Catholic University of Uruguay (UCU)	Uruguay	The Competitiveness Institute is a research center within the Business Department at UCU, concerned with competitiveness enhancement at different levels (country, regions, clusters, firms). It has a specific mission to promote an active space for the reflection, creation and dissemination of knowledge on competitiveness, public policy, strategy, and innovation. Through its interaction with different regional stakeholders the Competitiveness Institute seeks to contribute to reality transformation and the improvement of wellbeing at the region.

links with researchers from UBC and the Competitiveness Institute in Uruguay came from previous bilateral collaborative projects and joint teaching and PhD supervisions. From these collaborations there was an awareness of a common approach to genuine, not performative, engagement with regional partners and stakeholders to help stimulate and drive forward regional transformation as a core element of research. Researchers at Orkestra had written a white paper exploring what this meant for institutions trying to be both robust academics and transformative practitioners. They named this ambition as becoming Transformative Academic Institutions (TAI).

After the pandemic, Orkestra and UBC organised a webinar to start a conversation across places (Basque ~~Country~~ in Spain/Europe, the Okanagan region in Canada/North America and Uruguay in South America) on the role of universities and research centres in reimagining and reshaping economic development futures.[2] This initial webinar developed into the iterative process described below. Figure 1 outlines the overall process.

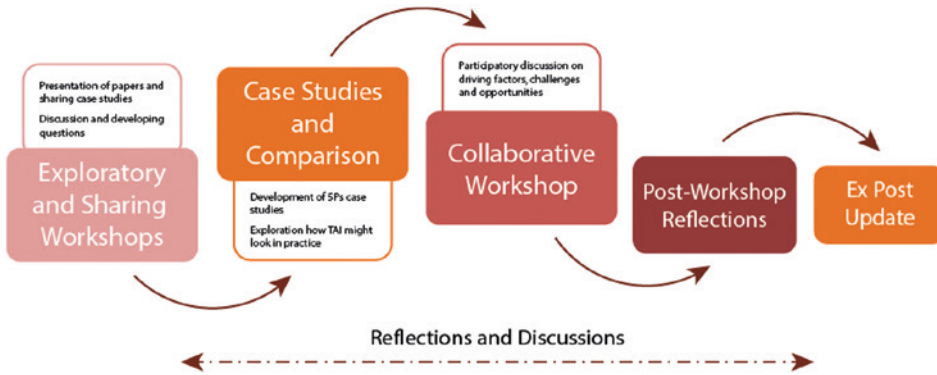2   See *Reimagining economic development futures*: https://youtu.be/z3jAyFrdcwk.

Exploratory research approach
SOURCE: AUTHORS OWN ELABORATION

3.1a   *Exploratory Workshop (May 2021)*

As an introduction and an initial prompt for discussions, Orkestra shared the position paper they had developed to articulate some of the challenges and ambitions in the TAI approach: 'Transformative Academic institutions: An experimental framework for understanding regional impacts of research' (Aranguren et al., 2021) in advance of the first workshop. At the workshop itself this was presented and discussed. The paper defined TAIs as research centres created within universities with a mission to proactively engage in the socioeconomic development of their regions and proposed an experimental framework to map the relationship between their role in the global academic knowledge community and in the (local) practical knowledge community.

This exploratory session was used to gather reactions to the paper from the other four partners, and reflections on how it resonated (or not) with partner experiences. The paper stimulated debate and prompted reflections on similarities and differences in each context. The initial reaction was very positive, with participants describing how their experience resonated with the challenges and ambitions presented in the paper. The workshop concluded with agreement that the partnership should continue this exploration and started to develop research questions for the group to address collectively, including how to evidence impact of this approach. Two further partners agreed to share their experience of engagement for impact in their research in a follow up sharing workshop.

3.1b   *Sharing Workshop (June 2021)*

This workshop was structured around tangible shared examples from two partners (Innovation School, GSA and Competitiveness Institute, Uruguay) of how

research impact is captured, particularly evidencing value for societal partners and for academics. This contribution had been prompted during the previous discussion on how we were valuing our contribution, and who was defining and evidencing that value.

The GSA example described the recent exercise in developing an impact case study (ICS) for the Research Excellence Framework (REF) submission and assessment. In this context impact is defined as "an effect on, change or benefit to the economy, society, culture, public policy or services, health, the environment or quality of life, beyond academia" (UKRI, 2021), and aims to articulate the difference we make and the evidence for the difference we make or have made (Boddington, 2021). The ICS focused on how using participatory and co-design processes helped to improve user experiences for health and care services across Scotland, through supporting the development of new services and technologies, providing a lived-experience evidence base for health and care decision making and intervention development, and supporting health and care professionals to engage more effectively with stakeholders. The case also highlighted the challenges in evidencing such value (to what extent this happened because of us) and the academic demand to anchor in research, which can still be a challenge for action research and participatory design approaches.

The Competitiveness Institute, UCU case explored how they keep track of impact and uncovered some of the main challenges they face both within and outside the University. The Institute seeks to "transform our reality, contributing to the enhancement of Uruguay's competitiveness", by conducting applied research and consultancy projects working in strong linkage with different regional stakeholders. Tracking impact included evidence and publications, but also invitations from industry, government and NGOs to discussions and action, as well as societal contribution to the debate (and measurement) of competitiveness in the country. Challenges included the (still) poor linkages between firms and academia (particularly for social research agendas), as well as the internal prioritisation of academic outputs, and a lack of institutional flexibility. The specific example of the state of competitiveness in Uruguay report showed strong social impact, influencing debate and action, but still challenges with being valued within the Business School and wider university structure, especially regarding accountability matters and the evaluation of individual researchers.

The examples described above led to further discussion and defining of the research questions, with an initial focus on What does it mean to be a Transformative Academic Institution?

3.2 *Writing of Mini Case Studies and Subgroup Analysis*

Whereas the first two workshops had been good opportunities for sharing experiences and had generated significant discussion of ideas and an initial defining of research questions, it was felt to be helpful for a smaller group to progress streamlining and facilitating the process for identifying areas to focus on for further discussion. As such it was decided that a smaller group would help analyse the discussions and outputs so far and proposed a more structured approach (whilst still remaining open and iterative) to take forward the debate (and generating knowledge in the process). A subgroup was therefore established, involving all institutions, who analysed the outputs so far and designed the next stage for exploration.

As a further contribution, each partner was invited to develop a mini case study to articulate their TAI experience including reflections on their roles in territorial impact, using a common framework (the 5 P's) to briefly capture the following areas:

– **Purpose**
  Why were we doing this and what are we aiming to achieve?
– **People**
  Who was involved and who was interested in the outcomes?
– **Practice**
  What did we do and put in place, and any immediate outputs?
– **Performance**
  How are we progressing towards our ambition and any outcomes?
– **Problems/possibilities**
  What challenges did we encounter, what could be improved, what did we learn?

It is worth noting that developing the case studies stimulated some challenge in itself as partners felt they were still discussing what transformative meant within their own context, how much agency they had to articulate this within their institutions, and indeed who defines value within territories and communities (who may not agree on that definition), but this feedback in itself was informative for the overall debate on how universities and researchers can situate themselves in that conversation.

Case narratives were then analysed by the subgroup to explore similarities and differences, and other key insights. For example, as well as pulling out commonalities in drivers and approaches and the challenges of evidencing, the analysis also showed some similar themes in how we influence out regions (including engaging hidden voices) and how we influence our institutions (showing that transformational engagement should be valued). The Findings section below gives further details of these commonalities (and also differences). The outputs from this analysis were shared in advance of the final

stage using collaborative online tools (MIRO), allowing the wider group to add further reflections and contributions.

3.3   *Collaborative Workshop* (*November 2021*)

The wider group from across the institutions then reconvened for the final collaborative workshop, involving shared online tools and facilitated discussions on structured questions (both in cross institutional breakout rooms, and together in plenary). The aim of this process and activity was to develop a greater shared sense of the challenges and opportunities for university territorial impact, from which to develop shared questions or briefs in view of further research and options for collaboration to explore new ways of tackling these challenges and opportunities.

As well as an initial discussion on the analysis of the outputs so far and the case study development, this third workshop was structured around exploring three further questions to delve deeper into our common (or not) understanding of TAI, how to make it practical and deliverable, and how to measure success. These questions were:

– **What can transformative academic institutions be?**
  (the vision, purpose, motivation)
– **What are the ways it can work well (or not)?**
  (what takes us forward or holds us back)
– **How might we evidence (and show) the value we are adding?**
– (what difference we are making and how we know)

These discussions were held online in smaller groups, each from across all institutions, to allow greater contribution from all. The key learnings from these discussions were captured on the Miro board and shared with the wider plenary as a conclusion to the workshop.

As well as notes from the facilitators (volunteers from each institution led the discussion in each breakout group), the online workshop was recorded and transcribed so that none of the richness of the debate was lost.

3.4   *Post Workshop Reflections* (*Spring 2022*)

The final outputs from the research were collated and shared, before a short, structured feedback was collected from across the partners with reflections from participants on the process, key learning, and opportunities for further research. These reflections contributed to the initial conclusions below.

3.5   *Ex-post Update* (*March 2023*)

One year later, the partners reconvened to discuss how ambitions for engaging for sustainable development and transformation were being taken forward (and if indeed they were). Partners updated each other on changes in

TABLE 2   Inputs and outputs from the process

Stage	Dates	Inputs	Workshops and other	Outputs
1	May 2021	– Transformative Academic Institutions	Exploratory Workshop	
	June 2021	position paper – How to measure societal impact (GSA and UCU examples)	Sharing Workshop	Discussion outputs and research question
2	July–Oct 2021	Discussion outputs and research question	Writing of mini case studies (5 P's) and subgroup analysis	Case study comparison and key insights
3	Nov 2021	Case study comparison and key insights	Collaborative Workshop	Key learnings and MIRO capture
4	March 2023	Key learnings and MIRO capture	Post workshop reflection and ex-post update	Research findings and further research

structures, teams, institutional support and the wider environment, and shared key priorities for the future (short- and medium-term). These additional insights reinforced preliminary findings and provided concrete illustrations of the challenges and opportunities associated with universities' regional transformative mission (see next section).

Table 2 below presents a summary of the inputs and outputs of each one of the stages of the process described above.

4   Findings

The early workshops involving discussion of the position paper and sharing of specific cases triggered an initial positive response across the partners who identified with the experiences being described. As the discussion unfolded, however, this also uncovered challenges and differences (in context, in institutional models, in local stakeholder relationships, and even in approach).

Case study analysis of the 5P exercise looked at similarities and differences across partners organizational research settings. This highlighted important factors for success, including a real focus on bringing about change, working collaboratively with partners, and focusing on key regional challenges. There was also a strong theme of establishing independent credibility whilst being connected to the real world. This also highlighted barriers to this approach, for instance the difficulty to change some mindsets in academia, especially at strategy or mission definition levels, the issue of accountability (and agency) and the challenge of evidence collection to show the value of the approach.

Despite a diversity of approaches (reflecting the multi/interdisciplinary nature of this research partnership) there was common emphasis on bringing in external knowledge and supporting partners through a change generation process: *"Where it works best is where you work with external partners to uncover a common challenge and find collaborative "action areas" to address".*[3]

There was also a strong commonality around ensuring flexibility within the process (to adapt to different needs and requirements) and building a mutual learning environment. This last point was raised by some partners as extremely important emphasising that creating liminal spaces where communities and universities can engage and find new ways of imagining the world was the only way to create a new future: *"Creating a space where individuals with different cultures and competencies can interact".* This reflects thinking by Howard-Grenville et al. (2011), in their description of an in-between space where the personal and the public, the possible and the ambiguous, the familiar and the unfamiliar, the existing and the new are explored.

Challenges with this approach also highlighted some commonalities, in particular developing credible ways to measure impact, the importance of evidencing intangible outcomes and influence, and ensuring an ongoing dialogue to meaningfully include stakeholders: *"There are challenges with funding and how academics are measured which drive you down a certain route".*

From the final collaborative workshop, where these themes were further debated, key findings are summarised in Table 3.

The discussion also highlighted some further questions including: 'Is impact always positive?'; or 'Can TAIs contribute to a negative outcome for certain communities?' (for example, reinforcing dominant narrative for socio-economic models). This raised the importance of disruption and bringing in different thinking and perspectives as part of the essence of TAI approaches: *"Unless it*

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3 All quotes are taken from the systematization of discussions, research journals and miro board.

TABLE 3   Key Findings from the Collaborative Workshop

Question exploring TAI	Key elements of success	Challenges
What can transformative academic institutions be?	Making a difference for partners/bringing about change Being future focused Vision to respond to societal challenges Being open to new ways of thinking Building capability and prioritising regionally responsive research	Institutional constraints and agency The marketization of transformation Ensuring genuine engagement Ethical tensions and prioritising institutional ways of thinking
What are the ways it can work well?	**Identifying a common challenge** **Using findings in teaching cases** **Developing collaborative initiatives** **Active support from university leadership**	Lack of institutional support Lack of legitimacy Not valued through traditional research rewards Difference in values, norms and mindsets
How might we evidence the value we are adding?	Evidencing the value in the process Gathering what others say about your work (positive and negative) Capturing the authentic story Impact over the longer term	Nurturing partnership Maintaining independence and integrity Stories of change competing with quantitative measures Difficulty in evidencing influence

is genuine engagement to bring in different voices, there is a danger of the third mission equivalent of 'greenwashing''.

The ex-post update reinforced initial findings and provided illustrations of how universities are operationalizing their transformative mission. For some, it also brought into stark focus the challenge of maintaining that agenda in the face of financial and strategic pressures elsewhere. Whilst some of the partners

had continued to develop and implement this approach and ambition within (in some cases) growing support from their institutions, for others changes in leadership, strategic focus and financial pressures had led to the disbanding of their research group.

For example, our partners from Orkestra had used the learning from the process to inform their annual stakeholder review. Through their long-standing interaction with territorial actors, they are now involved in a partnership process with their regional government through which they are identifying, together with actors from industry, government and civil society, the ambitions for the region in 2040 (Euskadi 2040). In order to strengthen its comprehensive transformative approach, talent development involves training on action research to first year doctorate students working in Orkestra, irrespective of the methodological approach they choose to develop their dissertations.

LU collaboration is supporting an innovation platform for the locality – Future By Lund – which is a partnership between the university, the municipality and local companies (large and SMEs). The platform aims to act in between various organizations to drive forward innovation activities that individual actors cannot implement by themselves. The business model and mode of system leadership is built on the mobilization and collaborative engagement of various stakeholders in the local innovation ecosystem – coalescing assets (funds, knowledge resources, capacities, infrastructure) and catalyzing action that contributes to innovative and scalable solutions for society. Lund University and Future by Lund have also worked in collaboration to develop a new model to track system change processes in their innovation portfolios.

Innovation School at GSA has continued their involvement with Triple Helix collaborations focused on territorial impact, particularly exploring the role of design in building collaborative innovation solutions and evaluating impact. They are involved in building the case for two Innovation Centres to become long term infrastructure within the ecosystem, focused on mission-driven areas (built environment journey to Net Zero, and digital health and care innovation), which have subsequently been successful in receiving funding. Within GSA, the school has also expanded to include researchers in digital and visualization, with a focus on external engagement, to become the School of Innovation and Technology (SIT).

In contrast, partners in Uruguay faced challenges in budget and focus of the institution, leading to the disbanding of the Competitiveness Institute as a research center and a focus back into traditional research. Whilst some of the group remained at the university, some left the institution, but were still taking forward opportunities to collaborate on areas of common interest (e.g. clusters and sector development).

The Social and Economic Change Lab at UBC had some similar challenges in budget and changes in institutional leadership. However, individual researchers were continuing to develop and explore questions related to the themes, including governance and organizational forms, research enquiry led by students, further investigating language and what transformation means (is it open, is it always positive).

5   Discussion

Our reasearch aimed to explore how TAI approaches look like in different contexts and identify the factors that support and/or hinder their development. We argued that through their experimental character, TAIs, understood as smaller research units within wider university structures, offer a pathway to overcome some of the challenges universities face to play an engaged role around sustainable development issues. We added that analysing their development in different contexts would also unveil some of the internal tensions and external barriers at play in universities' possibilities and willingenss to engage, as noted by Kempton (2019, 2021),

We found that while the concept of a TAI resonated with the experience of the partners involved, there was not an agreed view of what transformative academic institutions could mean, and indeed if it is the correct term. The iterative workshop approach allowed the partners to share experiences, challenge each other's thinking, articulate what is important for a TAI (vision, purpose) and how that can be supported to build effective partnerships within their ecosystems. As Karlsen and Larrea (2014) suggest, dialogue in the context of diversity is not necessarily a process that leads all participants to think the same; it is mutually shaping, allowing participants to gain a better understanding of each other.

Indeed, the Participatory Design and action research approach allowed a group of researchers, working in different contexts, countries and in very different organizational settings, to tackle questions in a novel way and deepen their collective understanding of what they are trying to achieve as researchers working in subunits within larger university structures. The research process unveiled and challenged assumptions around concepts of "transformative", "university", and "impact" with some suggesting the need to pause and build a shared language as a necessary step to creating shared meanings and, eventually, a shared agenda through the interactive workshop process the group has been developing.

This also raised the need to rethink (and perhaps reimagine) the purpose and remit of universities which might lead to alternatives to the TAI concept.

In any case, what this process revealed is that, while labels and concepts help to frame discussions around roles, research approaches, governance structures, and incentives, among others, self-reflection is key because it helps to develop awareness of what is being done, why and by whom. Moreover, the international dimension of the research process is a counterweight to the danger of matching research with local needs that can lead to it being detached from experiences and processes happening elsewhere and 'locked in'. This research process began with the recognition and feeling that new forms of 'internationalization' can be built by linking research processes in different territorial contexts and learning from and with each other.

The discussion also highlighted a possible tension between existing (and well-embedded) university roles of knowledge development and dissemination for and with society, and the new/evolving call for universities to act as curators and catalysts or facilitators of sustainable development processes. Questions were raised around the mandate for and relative focus of acting as a TAI given existing resourcing, structures and incentives. In addition, during the process of the research, participants challenged the assumption that impact of universities is necessarily always positive, highlighting the need to continually interrogate it since impact can also be negative, particularly for communities not engaged or included within the usual discourse. Furthermore, this led to debates on who decides the value of the impact generated. If that assessment always rests with the university, there is a risk of a single perspective dominating the thinking and raised the potential of using better engagement practices to help elicit different understanding of impact and value from wider stakeholders and communities. This in itself drew out the importance of the role of universities to challenge current models and disrupt conventional thinking by bringing in different perspectives. Furthermore, all partners agreed that universities have an important role to play in future thinking, a role captured in the notion of university 4.0 (Kempton et al., 2021).

Notwithstanding their different organizational contexts, the partners included in this research have two main things in common: a mandate or interest in undertaking socially relevant research and the small size of their organizational research setting in relation to the wider university structure in which they are embedded. They are each pushing the engagement agenda towards meaningful impact with partners but are only a part of their institutions rather than reflecting an institutional direction at this stage. That is, they are living labs from which universities (their own and others) can draw lessons in the process of developing a regional transformative role (Aranguren et al., 2021).

Of those partners who continued to be supported to take forward this agenda by their universities (to a greater or lesser extent), it is useful to reflect against the characteristics for transformation highlighted by Trippl et al. (2023) among

them their function, objectives and approach and type of collaboration. LU Collaboration's involvement in Future by Lund, for example, is a good example of a function of co-creation for sustainability and transformation and an objective of contributing to societal sustainability and transformation, as is the GSA collaboration for Innovation Centres as long-term innovation infrastructure. Both are collaborations based on a large-scale and long-term coalition with actors from academia, industry, government, and civil society. This type of collaboration is also showcased by Orkestra's engagement in Euskadi 2040 which ~~also~~ shows an approach characterized by a comprehensive, systematic response to several, interwoven problems and multi-directional knowledge flows across a wide range of stakeholders.

After only one year, we can observe that some partners are continuing to take steps to develop and implement their transformative mission (realising some of the characteristics outlined in Trippl et al. (2023), as mentioned above, while other partners have found the challenges of influencing and convincing leadership in their universities to support such approaches too challenging to overcome. Part of this could be explained by evaluation mechanisms that do not yet reflect the value of taking on a transformative mission or new institutional demands, as identified by Cinar et al. (2023). These mixed results are also reflective of wider institutional and external contexts, within which the TAI elements of these institutions need to operate. For some of the partners the direction and focus of the wider institution no longer supported the more experimental, engaged element. However, for others the approach helped confirm how they were balancing real integration of impact with their regions and good quality research. As such the TAI concept, now tested in different contexts, has proved a useful model, albeit not an easy one to implement and embed.

While case studies are not meant to generalise because they are context specific, the different institutional settings and geographical diversity of the partners involved in our experimental research offered interesting insights on the potential for TAIs to act as a pathway to support a regionally engaged role by their universities. The debates and tensions described in the paper are real and topical across multiple locations.

In all cases, a gap emerges between the discourse in policy circles (on the role for universities in Smart Specialisation, SDGs, etc.) and practice, where TAI approaches are still small, at times experimental and not institutionally embedded. In evolutionary terms this illustrates the tensions between what Giesenbauer & Tegeler (2020) label as the post-modern mindset of HEI 3.0 (centred in action research and stakeholder dialogue) and the practical need to abide by the rules of HEI 2.0 (that is quantitative success, professional

specialisation and competition) that should coalesce in HEI 4.0 (integrated learning labs).

Conclusions

Our research process involved an iterative process of sharing, comparative case analysis and collaborative knowledge building. Through cross-case learning between five different organizational research settings within wider university structures on ~~three~~ continents, we arrived at a better understanding of how the TAI approach translates in different contexts and identified significant factors, challenges, and opportunities for TAI approaches. The process also unveiled preconceptions and assumptions around engaging for sustainable development and transformation – taking on a regional transformative mission (Trippl et al., 2023).

The exploratory research conducted over several years highlighted certain steps that some partners were able to take towards operationalising the characteristics of universities regional transformative mission (including developing co-creation functions, a focus on contributing to societal transformation, and building larger-scale coalitions working in an open innovation approach). Alongside exploring approaches to achieve regional impact through transformative research and collaboration, the project raised the challenge of leadership and legitimacy in research teams taking forward these agendas, exacerbated by the different organisational structures underpinning each partner (including challenge-oriented research centres, collaboration offices and looser research groups) all operating as smaller, innovative parts of their larger host institutions. Challenges also remain around evidencing the value and impact of such approaches (both for stakeholders and within academic contexts), and more fundamentally in defining what that impact is (either positive or negative). Future lines of research include analysing the extent to which TAIs have had any influence on their wider university structures and overall culture and if their influence has facilitated theirs and their universities' engagement in place-based sustainable development.

This exploratory research has inspired a desire for continued peer learning in order to proactively work on developing institutional awareness, conditions and capacities for taking on the transformative role, as well as acting as a collective sounding board for collaborative exploration of these challenges. In addition, by building a research collaboration across very different geographies, and sharing learning and experience, this helped develop new avenues for internationalization of institutions, through a peer learning and collective

action research approach. For the UK partner in particular, post Brexit, new models of international collaboration need to be explored, but this is also beneficial to all the partners concerned. Indeed, a future line of research that could build on the idea of universities as integrated learning labs (Gisenabauer & Tegeler, 2020) could explore collaboration and mutual learning as internationalization, instead of its current understanding as global competition for faculty, students, funding and international standing.

Increasingly, there is an understanding that regionally embedded research institutions can play a key role in contributing to regional socioeconomic development by aligning research objectives with the strengths of the region and collaborating with local partners to jointly develop and capitalise on region specific competencies (European Commission, 2014). However, there is also a need for a more realistic, honest understanding of internal tensions and external barriers to the ability and willingness of universities to engage (Kempton et al., 2021). By exploring TAI approaches in different contexts, this paper offers a small contribution in that direction.

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Appendix 1: Overview of Partners Organisational and Territorial Context

Partner / University	Organisational and territorial context (institutional model and purpose, approach to and connections with external stakeholders, contextual opportunities and constraints)
Innovation School / The Glasgow School of Art Established: 2017 Staff: 35 (approx)	The Innovation School (established in 2017) emerged as a synthesis of various elements of the school of design (including bachelors and masters education, postgraduate research and the coordination of collaborative institutes and partnerships). The purpose of the Innovation School is to both teach and deploy design-led innovation processes in research activities that explore and give form to collaboratively sourced concepts of the possible (future) solutions to complex challenges. This purpose (human-centered and future-focused use of design as a catalyst to make change happen) embeds an action-oriented and participatory approach with external stakeholders. Through dialogue and participatory processes (with users, stakeholders, communities and organisations), design innovation is used to scope and develop an understanding of the challenges/needs for change, build knowledge and capabilities for change, and share knowledge to develop ownership of change. Research programmes and project-based learning is always collaborative, and users of the work are often partners (seeking to co-develop knowledge, practices and impact) who usually have an organisational responsibility or stake in the project contexts and results. Given the collaborative approach, external stakeholders are often constituents (vs. beneficiaries) of the change being enacted and solutions that are developed. Working in partnership and collaboration is challenging – as delivery is often outside of own control/mandate, and there are diverse levels of outcomes (that most often in the longer-term and are difficult to trace back to change processes led by the Innovation School. Resource/funding is always challenging and is often focused on delivery for external partners. This makes longer-term partnerships and collaboration (which takes time and investment to build) strategically important. As one small part of a larger institution, the Innovation School can be constrained by HEI-wide factors and have difficulty carving out its own autonomy.

(*cont.*)

Partner / University	Organisational and territorial context (institutional model and purpose, approach to and connections with external stakeholders, contextual opportunities and constraints)
Orkestra / University of Deusto Established: 2006 Staff: 40 (approx)	Orkestra was established in 2006 within Deusto Foundation, the foundation for knowledge transfer of the University of Deusto. Orkestra was created with an explicit mission to foster the competitiveness of the Basque ~~Country~~ through action-oriented research that improves the well-being of its citizens. While it maintains a strong relationship with Deusto University and is physically located on its campuses in San Sebastian and Bilbao, Orkestra's funding is independent of the university, coming from a mix of direct funding from a relatively stable set of regional stakeholders (primarily government institutions at different levels and firms) and the pursuit of competitive research funding (regional, national, EU, international funding calls). To fulfil Orkestra's mission, its team of around 40 full-time researchers and research-related staff are expected to be at the frontiers of international academic knowledge in their areas of expertise and to leverage that knowledge to respond to practical challenges related to the Basque ~~Country's~~ competitiveness and wellbeing. This is achieved through engagement with academic literature, debates, and networks, while responding to practical challenges is achieved by developing action-oriented research projects that involve a spectrum of different levels and types of engagement with regional stakeholders. Research at Orkestra is organised in 4 transformative research labs in the areas of (i) public policy; (ii) smart business; (iii) wellbeing; and (iv) energy and environment. Rather than formal structures, these are conceived as fluid spaces for the co-creation of knowledge and action among Orkestra researchers and the regional stakeholders with which they are working, thereby co-generating actionable knowledge useful for their decision making. This knowledge is systematized in the form of scientific articles that contribute to the academic discussion on regional competitiveness as well as to the practical implementation of similar measures in other territories. Orkestra has developed and applied a model of transformative research (i.e. research that has a strong connection between academic knowledge and knowledge of practical challenges), demonstrating that there is a connection between the ~~action~~ research that Orkestra ~~leads~~ (and academic outputs produced) and the societal regional and local challenges. While this helps demonstrate the value of their ~~action-oriented~~ research approach, Orkestra experiences a need for more of a shared responsibility among participants in a territorial context ~~for the transformative research (and change processes) undertaken~~. Defining metrics that capture the territorial impact of research should directly engage stakeholders (that are themselves engaged in the change process).

(*cont.*)

Partner / University	Organisational and territorial context (institutional model and purpose, approach to and connections with external stakeholders, contextual opportunities and constraints)
LU Collaboration / Lund University Established: 2016 Staff: 30 (approx)	LU Collaboration is a department within the university's administrative section for research, collaboration and innovation, with the role of promoting collaboration between the university and societal actors. The department is the operational arm of Lund University's leadership – via the External Engagement Council.[a] The aim of LU Collaboration is to combine academic knowledge of the University (more than 50.000 researchers and students from 8 faculties) with the expertise of different external actors (e.g. companies, municipalities and other public sector actors, research funders and other organizations) to tackle major challenges.

The department does this by assisting with coordination, communication, skills development, action research and other tasks that support the initiation and development of cross-faculty projects and platforms. These projects and platforms span the areas of circular and biobased economy, future materials, sustainable cities and mobility, health and life science, sustainable finance, and research and innovation policy. The department also has the responsibility for coordinating LU's engagement in larger European collaborations (e.g. the EU's Knowledge and Innovation Communities – KICs). The department does not have its own research capacity; rather, it functions as an intermediary "docking station" and "switchboard" for mobilising researchers and students together with groups of external actors in larger (and longer-term) collaborative endeavors. This is done in partnership with other intermediary actors – including e.g. the innovation platform Future by Lund. The department also works to develop collaborative/system leadership capacity and new methods for tracking and analysing system change processes. This is pursued through interactive research (together with collaborative initiatives and research funders).

Through its work LU Collaboration has identified a number of challenges to mobilizing and implementing transformative research. Researchers have a need for a clearer/stronger mandate and merits for coordinating and working with transformative/longer-term societal change processes (as current measures focus only on teaching hours and publications). In addition, there is a need to develop the types of collaborative activities and working approaches used. (Current approaches have a limited degree of interaction and action.) Finally, there is a need to adjust expectations/mind-set, measures and methods for capturing progress and evaluating impact of collaborative endeavors. Although the main purpose of the department is promoting collaboration between the university and societal actors, the main indicator of success is research funding secured. It is still a challenge to define other indicators and ways of demonstrating the value of collaborative action with external stakeholders.

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a   Initiated in 2016, led by the pro-vice chancellor for external engagement and including deans from all faculties.

(*cont.*)

Partner / University	Organisational and territorial context (institutional model and purpose, approach to and connections with external stakeholders, contextual opportunities and constraints)
Social and Economic Change Lab / University of British Columbia Established: 2020 Staff: 24	The Social and Economic Change Lab at the Okanagan Campus of UBC is a multi-disciplinary team of faculty, staff, student and visiting scholars who engage community and industry partners in social and economic projects through research, learning and community-oriented initiatives. The lab is an inclusive space that encourages low barriers to collaboration – welcoming new partners, students, faculty, and researchers to join. The lab's work is centred around creating cross-campus possibilities that connect to community challenges in sectors locally and globally. The lab fulfils its purpose by surfacing knowledge from diverse perspectives to create interdisciplinary contexts where research and learning can be transformed through deliberate experimentation with external stakeholders (in projects and educational programs, training and mentorship, collaborative research centres and networking activities). The lab has a focus on two main themes: social innovation and wine – creating spaces where communities and universities can engage and find new ways of imagining and exploring the world. Based at Okanagan Campus provides an opportunity to be a more embedded part of the territory and its challenges. At the same time, as a university-based lab, the group is challenged to define and re-frame research and teaching in relation to the interactive work pursued with external stakeholders (what counts as knowledge and evidence of impact).
Competitiveness Institute / Faculty of Business Studies, Catholic University of Uruguay Established: 2007 (closed 2023) Staff: small number of researchers that would grow as needed for projects captured.	The Institute saw their purpose as a boundary spanner – managing the balance between different change generation processes in collaboration with actors from the territory (with the ultimate objective of improving wellbeing for society). The Institute strived to go beyond traditional research – bringing in expertise from multiple disciplines and becoming more interactively engaged in change processes with other actors. As a smaller group within the university, the institute was challenged to promote and position its research and transformative mission activities within the broader university. In a period of consolidation and cost-cutting, this led to closing the institute.