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University Contributions to Business Cluster and Localised Economic Development:

The advantages of an expanded definition of university knowledge exchange and associated measurement challenges

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Funded by
UKRI Research England

Research England national knowledge exchange metrics programme

This *Expert Insights paper* was commissioned by UCI, as Research England's national knowledge exchange (KE) metrics advisers, to provide expert insights to inform the Research England-UCI work programme to develop better data and metrics for KE.

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Suggested citation

Nelles, J. and Abdul-Rahman, S (2026). University Contributions to Business Cluster and Localised Economic Development: The advantages of an expanded definition of university knowledge exchange and associated measurement challenges. UCI Expert Insights Paper Series on University Knowledge Exchange and Regional Economic Growth. Policy Evidence Unit for University Commercialisation and Innovation, University of Cambridge.

Published by the Policy Evidence Unit for University Commercialisation and Innovation, Institute for Manufacturing, University of Cambridge.

About the UCI Expert Insights Series on University Knowledge Exchange and Regional Economic Growth

There is significant policy interest in the UK in strengthening local economies to fulfil their economic potential and address long-standing spatial disparities. Universities have a significant role to play in helping to deliver policy ambitions in this area, including through their knowledge exchange (KE) activities.

Funders of KE, including Research England, face increasing pressure to develop approaches to enable universities, through KE, to strengthen contributions to regional economic growth. However, progress is hampered by the lack of fit-for-purpose data and metrics capturing universities' potential to contribute to regional growth outcomes. For Research England – which allocates KE funding to universities through both formula-driven allocations and competitions – this constrains their ability to:

- Allocate funding to enable universities to contribute to regional growth through KE
- Track and evaluate the performance of such funding programmes
- Support learning and improvement by universities around how to deliver effective and impactful regional economic growth initiatives

To address this issue, Research England and the Policy Evidence Unit for University Commercialisation and Innovation (UCI) at the University of Cambridge, are working closely to identify and progress opportunities for better data and metrics in this area.

To guide this work, leading academics with expertise on regional economic growth, universities, and KE, were commissioned to produce a series of *Expert Insights Papers* examining where progress could be made. The papers synthesise the latest insights from research and practice, and offer thoughts on where better data and metrics could be developed to meet funder needs

The topics were shaped by a policy evidence roundtable in September 2024, which brought together national funders, policymakers, and academic and sector experts from across the UK to identify key gaps. Key topics include:

- Approaches, opportunities and challenges to fostering regional economic growth (including theoretical and empirical insights, and latest international practices).
- Opportunities and challenges for where and how universities can contribute to regional economic growth through KE.
- Types of regions or regional contexts and how these shape the role universities should play in enabling economic growth through KE.
- University KE pathways for delivering impacts on regional growth
- The types / scale of capabilities, resources and alignment needed within universities to deliver KE aimed at supporting regional growth, and the ability of universities to adapt and reconfigure to deliver.

Abstract

Scholarship on university knowledge exchange activities is increasingly recognising a wider range of potential roles and impacts of higher education in economic development. For example, Kelleher and Ulrichsen's (2024) model envisions five such roles – generative, supportive, boundary spanning, developmental, and transformative – and offers an expanded map of what universities are capable of or, in many cases, are actually doing. However, many of these activities are not tracked and can be difficult to measure.

Higher education institutions hold a privileged place in literature on business clusters. As key sources of research, expertise, and skills, stakeholders interested in developing business clusters often seek to improve university-business relationships focusing on increasing relevant skills provision, boosting knowledge exchange, encouraging partnerships, promoting university involvement in cluster governance, and leveraging expertise to enhance place-based competitive advantage. All of which has tended to foreground university's science and technology capabilities and their functions as economic actors.

But what role do arts, humanities, and social sciences (AHSS) disciplines have for cluster development? And how does applying an AHSS lens to the roles of universities in clusters reveal challenges in developing metrics for evaluating impact across all disciplines?

The paper suggests that applying an AHSS lens exposes important limitations in current metrics and evaluation frameworks, which are ill-equipped to capture the full spectrum of university-led value creation—including cross-disciplinary and social impacts. It draws from recent research on AHSS valorisation (Abdul-Rahman et al., 2025) and innovation clusters (Nelles et al., 2023, 2024, 2025) to advocate for an expanded definition of university knowledge exchange, one that recognises and makes visible the diverse ways that universities contribute to cluster development and socioeconomic growth beyond conventional commercialisation and science and technology-oriented frameworks.

Contents

1 Introduction

Higher education institutions hold a privileged place in literature on business clusters. As key sources of research, expertise, and skills stakeholders interested in developing business clusters often seek to improve university-business relationships focusing on increasing relevant skills provision, boosting knowledge exchange, encouraging partnerships, promoting university involvement in cluster governance, and leveraging expertise to enhance place-based competitive advantage. All of which has tended to foreground higher education's science and technology capabilities and the function of universities as economic actors.

But what role do arts, humanities, and social sciences (AHSS) research in universities have for cluster development? And how does applying an AHSS lens to the roles of universities in clusters reveal challenges in developing metrics for evaluating impact across all disciplines?

As it happens, recent theorising about the broader impact of higher education has naturally evolved a more encompassing perspective on the potential of university-based research, researchers, and universities themselves to contribute to societal wellbeing beyond the traditional (and remunerative) foci of startups, spinouts, and licensing. This evolution, in part spawned by an increasing emphasis in governments around the world on "grand challenges" and "wicked problems", has prompted a new (or renewed) interest in how publicly funded research can contribute a broad spectrum of technical and non-technical solutions (Göransson et al 2022). In this context, the arts, humanities, and social sciences have arguably ascended to new prominence (Wagner et al. 2024). Observing this, theory about university impact continues to grapple with how to contend with the wide variety of mechanisms and benefits of knowledge transfer/exchange and move beyond frameworks that were originally designed with STEM outputs in mind.

While theorising impact is one thing, measuring it is another. The difficulties of measuring the influence of AHSS research on societal outcomes are well known (Ghazinoory et al. 2025; Reale et al. 2018) but take on additional complexity in the attempt to trace benefits to specific territorial scales or places. This problem has gained new significance with the UK Government's recent reiteration of its reliance on business clusters as engines of economic growth, placing them at the heart of its new The Modern Industrial Strategy (UK Government 2025). This framing (once again) focuses attention on maximising the return on public investment – this time, for target clusters and city regions.

However, there is a growing consensus, evidenced by the collective exercise of this volume, that we lack metrics that effectively capture the contribution of universities to their local and regional economies. Kelleher and Ulrichsen (2024) argue that this limits our ability to impactfully allocate public funding to incentivise universities to include local impacts among their priorities; prevents effective tracking of impacts that do occur, and of policy interventions; and impedes strategic learning that could enable a better understanding of how universities can better contribute to desired outcomes.

This chapter brings together recent scholarship on place-based innovation and knowledge networks and the commercialisation of AHSS research to highlight some problems that need to be solved in developing appropriate metrics of university impact on clusters and place-based development more generally. This piece argues for a more nuanced and critical approach to understanding the role of universities—especially AHSS disciplines —in local economic development and knowledge exchange. It challenges the common framing of universities as monolithic actors and, among other things, calls for disaggregating the agents within them to better assess impact. With respect to place, we question the assumption that local impact should be prioritised in university knowledge exchange, suggesting that broader knowledge networks and non-local contributions can be equally valuable. We also highlight the importance of system-level effects and urge policymakers to reflect on what should be measured in knowledge exchange metrics, advocating for a shift from measuring easy-to-capture outputs to tracing actual changes (impacts) and working backwards to identify their origins. We recognise that these suggestions may create more problems than they solve. However, to the extent that this collection aims to generate innovation in measurement regimes it is the moment to engage in more provocative, critical (and speculative) debates to drive forward this field of research.

2 Imagining a Role for Universities in Cluster Development (Beyond STEM)

Clusters are spatially concentrated groups of firms, research institutions, skills, and support structures in related industries that benefit from spillovers associated with agglomeration (DSIT 2024). This concept has drifted in and out of the mainstream of academic research in evolutionary economic geography and has enjoyed varying degrees of prominence in (particularly innovation-led) economic growth policy circles. The lure is understandable: clusters are engines of innovation, growth, and productivity. If they could just be catalysed in left-behind places, induced to grow more or faster in more productive areas, or orchestrated to serve national strategic interests they could be instrumental in solving inequality, increasing competitiveness, and tackling public priorities.[1] More than 30 years of academic research and public policy experimentation has yielded many insights that explain why some clusters work but has yet to find the key to reliably creating clusters *de novo*. Despite this, governments around the world continue to hope that cluster policy will offer a pathway to bolster place-based development (McCann 2019).

The current UK administration is no exception. It has intensified its focus on clusters as a vehicle for growth, situating clusters more emphatically than ever as an anchor of innovation and industrial policy. The Industrial Strategy declared that it is "unashamedly place-based, recognising that stronger regional growth is critical for the competitiveness of the [eight target sectors] and the resilience of the national economy: we will therefore focus our efforts on the

[1] Lest it seems like adopting cluster policies is a win-win prospect, there is an evolving literature detailing the potential dark sides of cluster investment for inequality, sustainability, and local path development (Koshcheev et al. 2021, Lang 2009, Vincente & Vincente 2018).

city regions and clusters with the highest potential[2] to support our growth-driving sectors, in England, Wales, Scotland, and Northern Ireland" (UK Government 2025, 22). This approach is likely to subject the activities of higher education institutions in these selected locations to greater scrutiny, generating increased expectations of economic return.

The Industrial Strategy itself highlights this expected role, emphasising that universities' contributions will be critical to delivering on the goals of the strategy. The report cites the impressive global rankings of UK institutions and their classifications as "world leading" and "internationally excellent" (REF 2021), the economic contribution of the UK's higher education exports (HM Government 2024), the number of FTE jobs created directly and through the wider economy (London Economics 2023). It also touts the impact of public investment, much of which is funnelled through universities, on private sector investment and productivity as well as figures that demonstrate that university spin out activity has increased significantly over the last decade (Frontier Economics 2024). While these figures suggests that universities are likely to continue to fuel innovation-led growth, what these claims do not explain how these dynamics play out locally – the topic of this symposium. In other words, what do, and can, universities contribute to cluster growth and development?

Cluster and other place-based innovation literature holds that localised growth depends on the ability of places to build and sustain innovation and provide the resources necessary to support internationally competitive businesses. Higher education has always been central to these objectives in several different ways. Other contributions in this volume cover these arguments in more detail (see, for example, Uyarra and Sanchez-Barrioluengo 2025). Generally, the role of universities in the UK (and beyond) evolved from centring their value in providing teaching and research relevant to innovation systems (local or otherwise) through skills and training as well as relevant expertise and technology development that would fuel innovative economies. While technology and knowledge transfer occurred across a spectrum of activities, these were not seen as central to university functions. This changed in the second phase, often associated with the "Third Mission", wherein the university was expected to be more entrepreneurial – not just providing skilled workers or industry solutions passively, but more aggressively ensuring that technologies developed within universities be transferred to business, that faculty and students be innovators, and with university itself becoming involved in supporting and steering clusters of businesses. The framework of the Third Mission encouraged entrepreneurial engagement while policies that evolved in this period increasingly moved to require universities to demonstrate value to society (which almost always meant, "the economy") beyond their teaching and research functions. In the third phase, policy focus on societal (or "Grand") challenges demands that universities engage with a variety of stakeholders to co-create solutions (Galvao et al., 2019).

These paradigmatic shifts have varying implications for cluster development and policy and prioritised different fields of research and activities at different times. In the first phase, while universities were always anchored in and influenced the growth trajectories of places policy expectations were largely place-agnostic. In the Cold War and post-Cold War periods,

[2] The strategy's focus on funnelling support to *existing, high-potential clusters and city regions* removes the risk associated with attempts to seed clusters.

universities were more frequently seen as national assets. Specific pockets of university specialisation often developed in response to government investments into both public and private science and security research. Silicon Valley is the preeminent example of the kind of largely unanticipated spillover effects that fuelled cluster development. In part in response to the recognition of the importance of universities as anchor institutions in some places throughout the first phase, policy and scholarship in the second phase evolved to try to encourage and accelerate spillovers in order to stimulate cluster growth. Here, increasing local and regional impacts of universities was the point and the significance of higher education to place-based development was in ascendence. This period similarly emphasised and encouraged the translation of STEM knowledge, technologies, and skills, often through commercialisation of research, and the involvement of universities in the governance of knowledge-based innovation clusters.

Whether for national or localised benefit, the first two periods prioritised technology and knowledge transfer from STEM departments. This is not to say that there was no interest in the commercialisation of research from AHSS disciplines, but that these efforts were less expected to fuel the growth of clusters or local/regional innovation systems and so were frequently treated as afterthoughts, if at all, in policy, literature, and university practice. Nevertheless, as governments and funders increasingly sought to demonstrate return on public investment from the second phase and into the third, mechanisms to trace university impact came into vogue. The most familiar of these is the Research Excellence Framework (REF) in the UK and its variants, such as the Knowledge Exchange Framework (KEF) and Teaching Excellence Framework (TEF). This impact agenda broadened our appreciation of the breadth of potential outcomes from university research beyond traditional commercialisation pathways, increasing the space that AHSS occupied in impact conversations. This intersected with a contemporaneous rise in mission-based policy approaches that began to rely more heavily on AHSS insights in recognition of the rising number of problems that lacked purely technological solutions. While missions can be embedded in place, this period has generally tended to move away from place-based framing. The main exception, in the UK, was the Levelling Up agenda, which primarily sought to leverage place-based assets and investments to stimulate regeneration and recovery in left-behind places. While the language of levelling up has decisively waned, this agenda left behind the legacy of unsolved puzzles around place. The concept has firmly lodged itself in the political imagination but without a clear consensus about how to define place or what it means. Even as various solutions to lagging growth in places, and highly unequal growth of others, have been invoked like incantations – such as clusters, ecosystems, learning regions, innovation systems, and the like – we still lack consensus about how to effectively apply theory in practice or significant (read: reliably replicable) success stories.

What we can agree on are that place matters and that universities have a role in stimulating the economy. We are also coalescing around the idea that university contributions to growth agendas, be they local or national, need to recognise the potential of AHSS in addition to technology and knowledge transfer from STEM. It is to this question that we now turn briefly before returning to the question of how this shift affects the measurement of university impact in place-based growth ambitions.

3 Imagining a Broader Role of AHSS

The preceding analysis sketched the arc of university contribution to place-based development more broadly, and clusters specifically, revealing a gradual transition from extracting largely STEM-focused impacts to fuel local growth to a recognition of the value of AHSS in increasingly complex political puzzles. One of the problems in this transition has been that many of the frameworks developed to typologize and explain university functions were derived in the more STEM-intensive phases described above. Existing frameworks have tended to limit the imaginations, and hence, activities of knowledge and technology transfer professionals as AHSS outputs and contributions sit uneasily within these models. Particularly as discourse turned to entrepreneurial universities and university entrepreneurship the imperative for economic—often read as revenue-generating—impact tended to stifle research into and efforts to transfer knowledge that was less likely to achieve those goals.

Fortunately, as thinking about university impact has evolved, so too have frameworks that enable us to imagine and situate a wider range of knowledge transfer activities. For example, Kelleher and Ulrichsen's (2024, 23-24) reconceptualization of university roles in knowledge exchange specifically expands their potential contribution to economies at different scales beyond STEM and provides a framework to envision which mechanisms are likely to impact local economies and how. Their framework includes five knowledge exchange roles for universities: generative, supporting, boundary-spanning, developmental, and transformative.

In their ***generative*** role, universities create new ideas, technologies, and expertise through research, translating and commercialising some subset of these to directly generate economic value. As discussed above, the emphasis on commercialisation and economic value tends to favour STEM disciplines. However, if this role is expanded to allow for indirect economic impacts, then AHSS become much larger players in these discussions. Universities can also play a ***supporting*** role by applying knowledge to enabling businesses. A wide spectrum of activities populates this category including training and workforce development, provision of facilities and equipment, technical support, and business consulting. Because of the focus on business, there is again a slight bias towards STEM. But, given that this role includes broader business consulting activities, the social sciences are also significant. If the framework were to expand to include other types of entities beyond firms – such as governance, industry organisations, third sector, and community organisations – then the potential role for AHSS would increase further. The next three roles depart from the core economic focus of the previous two. In a ***boundary-spanning*** role, universities function as intermediaries in regional innovation systems, connecting stakeholders and facilitating collaboration. This role may require technical expertise in areas of intervention but is more likely to rely on governance skills. The ***developmental*** role builds on this foundation and imagines the university as an active participant in the economies within which they are embedded as strategic actors using expertise and investment to strengthen innovation capabilities, infrastructures, capitals, and funnel resources to stakeholders. This role relies heavily on AHSS contributions to understanding economies, available levers, and institutional dynamics. Finally, the ***transformative*** role envisions universities as fulcrums, drawing on capabilities inherent in all

previous roles, in supporting missions such as sustainability transitions, responsible innovation, and improving equity and wellbeing.

This framework demonstrates how the aperture of university knowledge exchange and impact is widening to simultaneously admit a greater variety of roles, recognising more than just STEM-based and economic impacts. This represents an important shift in debates about university functions that broadens the AHSS contribution and their significance in impact discussions. However, the emphasis in this, and other, knowledge exchange frameworks remain on *direct* forms of impact. That is, measurable (or at least easily observable) market impact through commercialisation, or direct relationships with businesses, organisations, governance arrangements etc. for the purpose of specific localised outcomes.

A recent thread of research on AHSS impact shows how indirect intervention can generate equally, or even more, significant economic impacts. In an analysis of AHSS REF case studies, Abdul-Rahman and Nelles (2025) determine that a significant number of cases generated economic impact even though they were filed in other impact categories. This means that analyses of REF that only focus on AHSS case studies that were filed as economic impact severely undercount these disciplines' economic contributions. This analysis also demonstrated that economic impacts were often indirect – for instance, research contributing to regulatory changes, public procurement practices, improving processes and practices, etc. can all have far-reaching financial implications for entire industries. At present, these kinds of impact are typically bundled into "system level effects" in knowledge exchange frameworks, and particularly in those that focus on understanding regional impacts. This represents a blind spot on the question of university impact more generally and of AHSS more specifically as well as posing difficulties in understanding the scope for university impact in local economies.

For now, it is significant that the discourse on university knowledge exchange has moved beyond just STEM/direct impacts. But while conceptual broadening of frameworks is welcome many questions remain about how to translate and manage some of the complexities introduced by this shift, particularly with respect to local impacts. We turn to these questions following a brief discussion of what the university is, or should be, in our discussion of impact.

4 What is "the University"?

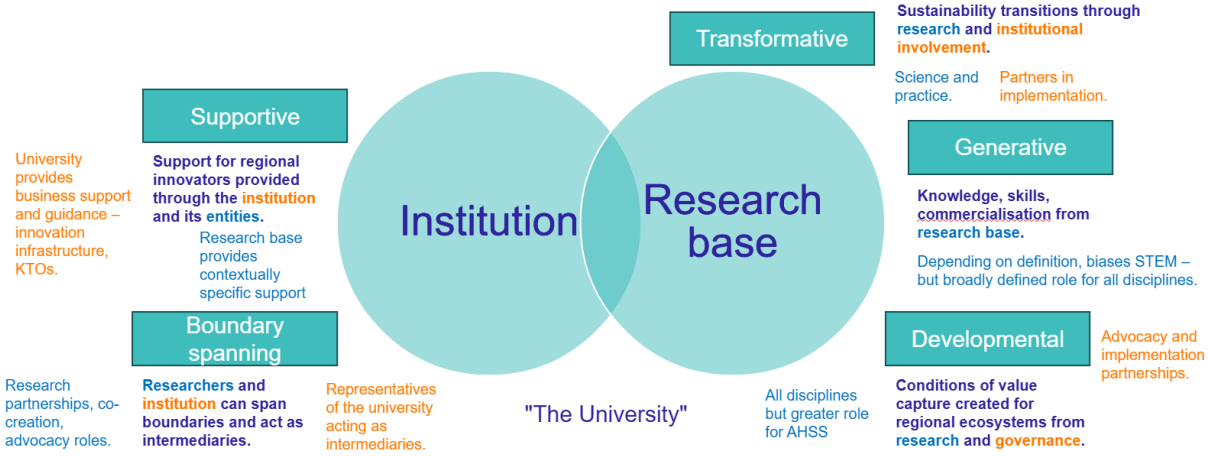
Turning our attention to measurement of university impact, it is useful to pause and consider what we mean by the "university" in this context and how that shapes our expectations of impact. Literature and policy discourse speak of universities as if they are monolithic – a single entity with one mind and clear, relatively uncontested, vision of its purposes. In reality, universities are significantly more complex organisms.

Despite mostly taking on the external appearance of a singular, coherent, hierarchical, and bureaucratically organised structure – or "predictable and mechanistic systems" (Starbuck 2015, 1293) – universities simultaneously bundle a multitude of different divisions, constituencies, factions, and centres, all of which have their own interests, agendas, and resources. These include students, faculty, administration, leadership, boards, departments,

operational staff, research centres, liaison offices, to name just a few components. Additionally, while these components exist in imposed bureaucratic structures, their behaviour is not neatly circumscribed and is more akin to a loosely coupled system (see Weick, 1976), or even organised anarchy (Cohen & March 1986), than rigidly governed. Cohen and March (1986, 3) rather colourfully argue that a "college or university is a prototypic organized anarchy. It does not know what it is doing. Its goals are either vague or in dispute. Its technology is familiar but not understood. Its major participants wander in and out of the organization. These factors do not make a university a bad organization or a disorganized one; but they do make it a problem to describe, understand, and lead". One might also add that it makes what we mean by a university as a strategic economic actor difficult to define. In other words, when we invoke universities as agents in economic contexts – e.g., cluster growth and development – this can signify different actors, or even different groups of actors, depending on the circumstance.

This poses complications for both the construction of conceptual frameworks and impact measurement goals.

Figure 1: Disaggregating what we mean by the university with reference to a knowledge exchange framework



Source: Adapted from Kelleher and Ulrichsen (2024).

For illustrative purposes, in Figure 1 we focus on two components[3] of the university to demonstrate how they, and actors within them, might be more or less relevant or have different functions within the five roles identified by Kelleher and Ulrichsen (2024). For instance, the **generative** role is mainly the purview of the research base of a university. That is, individual researchers, their teams, research centres, etc. Depending on how one defines the generative role – with a specific economic focus or more generally knowledge creation with potential applications – can constrain the contribution of AHSS. However, broadly defined, all disciplines can participate in generative activities. The **supporting** role can be played by the institution – by providing access to facilities, equipment, knowledge transfer offices, liaison programmes – or

[3] Note that these are vast simplifications and are, in themselves, aggregations of different loosely coupled actors. But hopefully this is useful for demonstration purposes.

the research base, which can furnish domain specific consulting and support through individual activities, integration with research projects, or through programmes administered in research centres. Similarly, **boundary-spanning** activities can implicate the institution through its administration and leadership (e.g., the involvement of university pro-vice chancellors in regional governance organisations or government task forces) but also possibly through its research base as researchers are often asked to, or independently play, convening roles. The **developmental** role is likely to implicate the university as an institutional actor in its capacity for affecting ecosystems through its own programming decisions, but this can also include researchers – particularly those leading larger or more mature collaborative research efforts that include or engage with external stakeholders and with specific expertise in aspects of ecosystem development. Finally, leaders of **transformational** activities are likely to share similarities with the developmental category where it will largely depend on the task at hand which (set of) actor(s) are most closely implicated.

All of this demonstrates just one central cleavage in how we perceive the university between research-based activities where individual faculty or research teams are the main actors involved in domain specific interventions and those in which the university functions in an institutional capacity as an anchor within a community, region, or national economy. Naturally, even this is a vast simplification, but we hope does highlight some of the difficulties that we will encounter in considering measurement of university impact. For instance, research output impact, which is relatively easily measured in terms of publications and citations etc., can be aggregated to the university level but is not produced by "the university". It is produced by researchers, who are certainly influenced by policies and practices of the university they are associated with but are also influenced by many other considerations only some of which universities have the power to change. Similarly, research impact is also created by the researchers, although it is much harder to measure.

The advent of mechanisms such as REF and KEF goes some distance to providing data about this kind of activity but, for a variety of reasons, definitely do not capture everything. These measures also do not consistently capture boundary-spanning, developmental, or transformative activities, which are similarly difficult to record and attribute without a census of all activities. Even then, the emphasis on recording impacts as specific *outcomes* discourages reporting of work in progress that may be in the process of creating these kinds of impact but that are difficult to evidence in the moment.

This discussion was intended to encourage caution and reflection about what we want to measure and why, and about how we attribute impacts. While universities are vessels within which knowledge is generated, they do not generate knowledge – their researchers do. So, if policy aims to increase local or regional impact from the research base within universities that requires attention to what types of roles it wishes to impact, effective understanding and measurement of existing activities, and appropriate intervention strategies (e.g., not everything is directly within the control of the university as an institution). The rest of this paper turns to another set of difficulties related to effective measurement of localised impacts in place and over time.

5 Tracing Impact and Measurement Challengers – Place, Time, and Beyond

In this discussion, we seek to explore some of the measurement challenges of conceptualising and quantifying university impacts on places more generally and on clusters more specifically. These fall into two broad categories: challenges with tying impact to place and challenges with understanding how and when to measure impact more generally. The concept of complexity is at the heart of both of these strands of thinking. That is, that connecting activities to impacts – whether in specific places or with respect to research – is a fundamentally difficult task. This is not to say that it's not worth doing, or that it cannot be done, but that making these links in consistent, meaningful, and measurable ways requires designing to acknowledge these complexities.

5.1 The Problem of Place

As discussed above, there are numerous challenges associated with measuring impacts of the different university roles. Further tracing their impacts in *place* is even more complicated. While universities have long been considered anchor institutions with tremendous potential to contribute to the growth of clusters and their local economies, there is nothing automatic about that. The assumption that knowledge generated within universities fuels local growth demands nuance. Kelleher and Ulrichsen (2024, 23) note that "the contribution of technology transfer (e.g. through spin-offs, patents and licensing) to regional growth can be limited, particularly where there is a mis-match between the technologies and ideas generated by a university and the needs of regional economies, or where the scale of activities and actors are insufficient to achieve critical mass in a particular domain within the region" (also citing Fothergill et al., 2017; Kitson, 2019; Trippl et al., 2015).

This point raises the importance of alignment between the supply of knowledge, expertise, support capacity, etc within local universities and surrounding industries and their absorptive capacities, strongly suggesting that we cannot simply assume that universities have significant local impact (either in alignment with their specialisations of that of their local economies). Playing this idea out further, though, raises some interesting possibilities. First, most universities will have some direct local impacts through their five knowledge exchange roles, but how much is difficult to determine. Even when alignment between universities and local economies is excellent it is unlikely that all (or even most!), of the impact of university research activities will be localised. This means that tallying up all activities across the five roles, for example, will not give an accurate picture of local impact. In an interesting, if not unexpected twist, it is also likely that researchers in universities are having impacts in places, clusters, and economies *other* than where the university is located.

Recent research on co-authorship and innovation collaboration between engineering biology clusters in the UK (Ortega-Argiles et al. 2025) shows that a significant amount of collaborative research published, and innovation projects in which university researchers are involved, is produced with partners outside of the places they are located. This means both that in addition

to local spillovers, clusters and local economies are fuelled through external knowledge networks *and* that even as local universities may contribute to their own economies, actors within them also contribute to the development of clusters in other regions.

It may be pedantic, but it is perhaps worth asking that when seeking measures of local impact of universities (and actors within them) do we mean only for the localities within which they are embedded or any localised economic impact anywhere? In the former instance, the challenge is about untangling and pinpointing specific types of impacts on physically proximate industries and economies from all of the rest of the impacts that universities and their researchers generate. And while this is a worthy exercise to better understand opportunities to extract more localised (predominantly economic) value from locally embedded higher education, it is important to ensure that local focus does not come at the expense of the (much broader, but also, sometimes, economic) value that universities generate for other places and other scales. Exploring the latter thread is also interesting because it suggests that solutions to levelling up left-behind places may not fully lie in the performance and alignment of local assets (including universities) but may also be about better connecting those places to relevant knowledge networks. And knowing more about which universities, and what kinds of research, are most effectively reaching beyond their places and generating spillovers at a distance could also be of policy interest.

At minimum, both scenarios require data collection strategies that enable accurate analysis of where impact happens. In the UK, adding spatial fields to REF and KEF is one of the easiest ways to facilitate this even if that data is still limited and only periodically collected. More complicated, but still potentially feasible, would be to also expand KEF and other mechanisms to collect data on boundary-spanning, developmental, and transformative activities, which are not currently fully covered in that instrument. This would ensure data coverage on a wider variety of activities that can impact localised cluster growth and economic development.

Any such data collection adjustments should remain open to the possibility that activities can have impacts in more than one place, or scale, at a time. For instance, a research collaboration involving partners at a network of universities and local stakeholders in each (ideally) creates knowledge benefits for all participants that can translate into benefits in the places they are embedded (multiple sites of impact). In another scenario, the involvement of a university in a national commission on skills provision may affect higher education policy that, in turn, creates regulations for universities in other places (multiple scales and multiple sites of impact).

These observations lead into a set of second order measurement issues. That is, research and engagement can create outcomes at different scales that indirectly impact cluster development and growth. How can these be accounted for? Should they be? Kelleher and Ulrichsen (2024) begin to explore this complication by explicitly distinguishing between the impacts that universities have due to direct interactions with local partners versus the *indirect* impacts that their work can exert on local and regional economies because of interactions in other parts of the system within which places/industries/institutions are embedded.

Collected broadly under the heading of system level effects, these impacts do not directly affect individual businesses, partners, or places. Rather, they influence institutions, rules, and practices at the level of markets, economies, or industries etc. While their first order impacts

result in system change it is important to recognise that these can, and often do, have second order (and more) implications for places. For instance, research that results in structuring public investment in offshore renewable energy impacts the *industry* first. Offshore renewable firms and stakeholders will respond to the direct stimulus – adjusting private investment strategies, growth plans, location choices, and so on. However, these decisions have inherent implications for places. Regulatory changes that encourage industry expansion will likely increase offshore renewable activities in *those places where that is possible* such as coastal areas and places with established industry presence. In other words, these changes are not likely to impact every place equally and are liable to influence cluster growth in a handful of locations. Given that many of these systemic changes have inbuilt spatial consequences there is a strong argument for expanding our conceptual framework of university knowledge exchange impact to account for, and measure, these results. Similarly, it is questionable to omit these indirect impacts given that system level effects can have much greater and enduring economic consequences than individual technologies or partnerships. However, accounting for these effects creates obvious challenges in tracking and tracing not only first order effects but also effectively revealing and measuring spatial implications.

From a practical perspective, it is perhaps enough (for the moment) to acknowledge the spatial influence of system level effects and to work towards finding reliable methods for understanding their magnitude. At minimum, both of the arguments in this section are entreaties to researchers and policy makers to avoid treating place (or clusters, local economies, etc.) as closed systems and reducing investigations of university impact to only those that are direct and purely localised. We argue that while that position allows for a neater understanding of the direct value university activities are generating locally, which can be useful in strategic contexts, it misses both localised impacts from university activities in other places as well as crucial system level effects that may indeed be more significant.

5.2 The Problem with Impact

While the focus here is on the measurement of knowledge exchange impacts on local economies, it is worth briefly exploring some issues with tracing impact that can also complicate the design and implementation of indicators. This section draws primarily on the work of Abdul-Rahman and Nelles (2025) and their analysis of AHSS REF case studies. This research focused on demonstrating that AHSS activities frequently generated economic impact but also makes several relevant observations about the nature and mechanisms of impact.

First, they observe that impact and output are distinctive ideas. That is, the existence of a thing – for example, a research finding, a technology, a partnership, a publication, a project – is not the same thing as the impact of that thing. Nor does the existence of a thing guarantee significant impact. This has implications for measurement to the extent that number of publications, of licenses, of projects, etc recorded per year are outputs, not impacts in and of themselves. These can be considered indicators of potential impact so, ceteris paribus, having more of these kinds of outputs the greater the chances that impacts may occur. But impact is more accurately *the changes that occur as a result* of those outputs or of their translation. Measuring activities or outputs is relatively easy and so tends to be the default in quantitative

and comparative impact exercises. Identifying and quantifying change is hard – particularly when data about change cannot usually be measured on the same scale, is nominal or at best ordinal.

Secondly, and relatedly, for a variety of reasons, comparative efforts to measure (usually quantify) impact have focused on a subset of activities that are perceived to be (a) most important and (b) easiest to collect data about. The STEM and commercialisation bias has been discussed elsewhere in this piece (and collection) but Abdul-Rahman and Nelles' (2025) work challenges these trends. They argue that, if we expand our horizons beyond direct and commercial outcomes, significant impact can often occur through other forms of engagement that are not always measured or prioritised. *Translation* is important. In the AHSS (although not exclusively) the research findings cannot be activated without agency – someone needs to interact with the findings and put them into practice. Researchers are often critical in doing this, acting as bridges and interpreters between academic contexts and practice. This is increasingly (albeit slowly) being recognised and embedded into university cultures and training in engagement is becoming more common. However, measurement regimes have been slow to incorporate different output vectors or include data on translation activities and academic cultures have not shifted rapidly to reward these activities.

Thirdly, impact is typically the result of a *bundle* of outputs and activities[4], often unfolding over time. It is rare that a single piece of research output will result in significant impact on its own and so measuring outputs alone, and without context, may risk overestimating impact potential. Ideas take time to develop and to translate and this process can take place through a variety of activities and outputs, from multiple papers to stakeholder interactions to research reports, collaborations, and interventions. This means that privileging certain types of outputs can ignore both the potential impact of a broader set of interactions (see previous point) but can also ignore the iterative nature of the research and translation process in which insights build across a spectrum of outputs and activities. Furthermore, this process takes place over time and impacts are not always immediate. This means that research that has not demonstrated impact in t=0 might be foundational to impact in t=n. Or that the same research might require translation activities along the way in order to generate effective impact. All of this is to say that focusing on individual activities or outputs as a basis to estimate impact may miss, and therefore risk deprioritising, the complex dynamics that ultimately generate meaningful outcomes.

These points suggest that, even before exploring impacts on place, there is still work to be done in understanding what we mean by impact and the limitations in current measurement practices. They point to an approach that focuses on understanding change first and then work backwards to attribute it to the bundle of outputs and activities that ultimately enabled it rather than seeking neat and straight lines between specific outputs and results. Adopting this approach also addresses temporal challenges as, having observed a change it is then possible to identify the impact journey (to date). This is in contrast to starting from activities and

[4] It is perhaps worth noting that activities and outputs can also result in a bundle of impacts although unpacking this is perhaps a bridge too far for this contribution.

assuming or expecting certain outcomes and, perhaps, only looking for outcomes that are most easily measured.

How these insights might be operationalised into impact mechanisms requires further thought. This could take the form of a theory of change, which would enable researchers to identify outcomes and link them to relevant outputs, activities, and inputs as appropriate. This theory of change would need to be sufficiently developed to account for a wide universe of potential activities (and outputs, etc). We offer some contributions to this process (Abdul-Rahman and Nelles 2025) but recognise that this is merely one entry into a field replete with critical approaches and that it is not (currently) structured as a theory of change. Further unpacking this thread of research to develop practical tools will provide ample entertainment for KE and impact scholarship, perhaps as part of the research agenda emerging from this collection.

6 Discussion and Conclusions

This admittedly far-ranging contribution has touched on several points salient to debates about the knowledge exchange value of universities to the development of local economies and clusters. It started from the assertion that AHSS are an important part of this conversation and has proceeded to demonstrate that adopting a not specifically STEM vantage illuminates some important difficulties that are, charitably, glossed over for the sake of convenience or, less so, blind spots for this field of research.

For instance, we argue that the way that we frame “the university” as an actor and source of impact deserves some critical reflection. Indeed, the fact that we’re not totally sure if we have effectively practiced what we preached throughout this piece stands as a testament to how difficult such an exercise can be. However, we feel that there is value in disaggregating the contributions of different agents within universities and recognising that they are not homogeneous or monolithic entities. We think that this is important in measurement practices, in describing policy implications of university contributions, and will help to more precisely outline expectations of impact from each of the versions of “the university” that might be relevant.

Turning to the question of impact and place, we reiterate that places are not closed systems. While it is reasonable to expect universities to generate some localised impacts, we (perhaps cheekily) question whether that is always necessary and challenge the proponents of increased local impact to interrogate how much impact should be localised and what good looks like. We also urge stakeholders to consider the implications of knowledge networks and consider how higher education activities can more generally be leveraged to generate spatial impacts. Recognising that research in other places may also be significant to industrial development (and how) is not tantamount to admitting the failure of local higher education. Rather, it broadens policy options and alleviates the pressure on universities to be everything to everyone in the economies within which they are embedded. Further, we urge stakeholders to consider the importance of system level effects on spatial outcomes. While this might not be a near term priority for the development of knowledge exchange metrics, it is nonetheless an avenue that this agenda should not long ignore.

Finally, we warn against the conflation of outputs and activities with impact and urge those designing measurement programmes to focus on what we actually want to measure rather than defaulting to what is easy to grasp. Through a series of arguments about the complexities of impact we argue for approaches that begin with impact (changes) and work backwards to understand which outputs, activities, and dynamics over time contributed to these (and where they originated). This flips the script and would force some serious consideration and problem solving about how to accomplish this at scale. If not feasible in the shorter term, it may be worth undertaking this "backwards" exercise to generate insights about what the strengths and limitations of existing approaches might be in comparison.

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