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Understanding how value, power and expertise circulates in (creative) knowledge exchange programmes

Dr Liz Roberts

Creative Economies Lab, Digital Cultures Research Centre, University of the West of England, Pervasive Media Studio, Harbourside, Bristol, UK

ABSTRACT

This paper uses the South West Creative Technology Network (SWCTN) in the South West, UK, as a case study to examine the diverse economies evident in knowledge exchange (KE) programmes delivering university-industry research and development (R&D). Counter to normative measures of success for KE programmes such as key performance indicators, and moving beyond evaluations that discount the diverse impacts of these programmes at interpersonal- or cross-sectoral-levels as 'intangible' or 'spillover,' this paper takes a cultural ecology perspective to deliberately make tangible the emergent dynamic relationships and multiple forms of value that KE programmes support and produce, and the wider implication of these for building regional creative sector capacity and cultural value. It highlights the multi-directional types of KE that happen between universities, creative industries and other sectors. It complicates linear models of innovation funding. The author draws on empirical data from interviews, surveys and ethnographic observation made possible through being embedded within the programme's delivery team. The paper critically assesses the expertise and power that circulate, finding that the goals and ethos, as well as the economic and non-economic values in the programme created tensions, problems of inclusion, and contradictory notions of success for the delivery team and for participants.

1. Introduction

This paper uses the South West Creative Technology Network (SWCTN) as a case study to examine the diverse economies of knowledge exchange (KE) programmes for university-industry research and development (R&D), including the emergent dynamic relationships and multiple forms of value. It looks in-depth at the types of expertise and power that circulate and the ways these solidify particular understandings of knowledge, creativity and value.

SWCTN was a £6.6 million R&D project to increase creative technologies innovation between universities and industry between 2018–2021. Funded by Research England's Connecting Capabilities Fund, it supported knowledge exchange and business development. The partnership comprised four universities and two creative production studios in the South West UK: UWE Bristol, Bath Spa University, Falmouth University, University of Plymouth, Watershed (Bristol) and Kaleider (Exeter). SWCTN provided funding for businesses and creative practitioners in the creative sector to conduct research, work with academics, and make new products in the fields of data, automation and immersive technologies. It sought to stimulate new cross-sectoral and university-industry collaborations through intensifying, and creating new, connections.

In the context of ongoing policy mechanisms including selective policies focused on the creative sector as economic winners, offering the most growth nationally, and related funding for creative sector-based clustering with their perceived positive spillover effects for regional innovation ecosystems (Monahan and Balawejder 2020; WECA 2020; AHRC Creative Industries Clusters Programme), the paper explores the role of UK University KE programmes aimed at the creative sector. It aims to evaluate the success of one such KE programme, asking the broader question: what does engagement with creativity and practice-led research associated with the Arts and Humanities actually offer in terms of sectoral spillover, capacity building, and regional development?

As part of its key performance indicator (KPI) reporting to its funder, SWCTN captured measurable impacts to show how knowledge moved across contexts in the region and translated into economic growth. Examples include: leveraging of £7.5 million in new funding, creation of 22 new businesses, 10 industry publications, 14 industry awards, 36 new performances and exhibits (see Roberts et al. 2021). What these KPI measures do not capture is how for those involved in the network, its value is complex, diverse and experienced in more than economic terms. Or how skills, resources and expertise circulated and were negotiated to arrive at these outcomes. A purely KPI based analysis also excluded cultural producers and network members who prioritised forms of value beyond economic. Understanding the range of value and values, and the micro-relationships in any cultural ecology is essential to understand how KE programmes can support capacity building and values-led modes of development. This paper steps beyond the normative evaluations of large KE programmes by largely economic-focused KPIs and instead focuses on the interpersonal and unexpected outcomes of person-to-person KE. This critical aspect of how creative networks thrive is often excluded from evaluations of impacts such as more linear 'helix' models as being 'intangible' or unmeasurable. This paper begins to address this gap in understanding.

This paper aims to:

- Examine the university-industry KE and cross-sector KE that took place in SWCTN and the types of value and outputs activated through them.
- Evaluate SWCTN's success in building KE in the region's creative sector.
- Critically assess the types of expertise and power that circulated through SWCTN.

This paper first situates SWCTN in the historical development of UK university-creative economy KE programmes and their desired outcomes for the regions they are located in. It describes the cohort-led methodology that SWCTN used to deliver creative KE.

It outlines the research methods used to evaluate the success of SWCTN's goals to intensify connections in the region and stimulate R&D and innovation. It then focuses more specifically on the values and impacts generated by new university-creative industry and cross-sectoral connections and seeks to make tangible some of the more invisible forms of value, spillover and ripple effects at network and sector level that are not always measurable or associated with economic indicators. The final sections critically assess the types of expertise and power that circulate within creative KE programmes, like SWCTN, and how successful they can be in building systems for more equitable, non-linear and non-hierarchical KE for regional innovation.

2. Literature review

KE is now an established component of university third mission (TM) activities, with the publication of the Knowledge Exchange Concordat in 2020 by Universities UK and the development of the Knowledge Exchange Framework (KEF) assessment by Research England between 2017 and 2020. KE is highly contextual, operating in different ways across different universities and their regional ecosystems (Haytor et al. 2020). KE literature, including the Concordat, considers the creation of a broad environment for KE across the University, with different degrees of formality within relationships, including 'industry pull' and 'university push,' or in terms of research producers and research users, which maintains a clear distinction within KE of the providers and receivers of knowledge (Weerasinghe and Dedunu 2021). Companies are believed to seek knowledge from universities due to quickly changing markets and a lack of resource to develop R&D in house (Weerasinghe & Dedunu 2021). The KE Concordat highlights the commercialising potential of academic knowledge through spin out companies, industry-partnered and funded PhDs, patents and licenses, and students providing the talent pipeline for local industries.

Sector- or region-level KE is well documented in general terms, especially how university activity has 'spillover' into local industry for example, or through broad brush comparisons across sectors and regions; however, specific examples of funded KE programmes are less evident in academic research by way of nuanced and critical reflection of how these programmes operate and create regional impacts. One context in which they have been reflexively explored is in KE programmes linked to the creative and digital economy. In the UK, examples include EPSRC Digital Economy Hubs, Innovate UK's Catapult Network, AHRC Knowledge Exchange Hubs for the Creative Industries, AHRC Creative Industries Clusters Programme, to name a few. Programmes like these aim to stimulate regional development and innovation through KE between universities and industry, and less so, the public sector. They have a specific focus on partnerships and bilateral working with the aim to strengthen the surrounding 'entrepreneurial ecosystem' or 'regional innovation system' (RIS) (Hauge, Pinheiro, and Zyzak 2018; Hayter, Rasmussen, and Rooksby 2020; Audretsch and Belitski 2021).

The UK Labour Government's creative industries programme made creativity a central method for generating knowledge, understood as a new form of commodity and, therefore, put it at the heart of the economy (Moreton 2021). As the growth potential of Cultural and Creative Industries (CCIs) became clearer, they attracted policy and research funding as a means of fostering not only economic impact, but social and

cultural impacts within a region (Bazalgette 2017; Foster Forthcoming). Originally inspired by Richard Florida's work on the 'creative class,' this idea has spawned a body of work (not without critique) exploring the benefits of clustering creative industries activity in a specific locale, the spillover effects this can have for the wider region, both economic and in terms of place-making (aesthetic benefits; quality of life; civic engagement) (Florida 2002; Foster Forthcoming; Dovey et al. 2016). Creative occupations are increasingly viewed as necessary for all innovation and entrepreneurialism due to their strength in ideas creation, diversification and knowledge-sharing (Chen and Tseng 2021; Moreton 2021). The creative economy has become a driver for city and regional development in which university-industry KE plays a central role.

Recently the framing has shifted from clusters thinking to a cultural ecologies approach (Vaizey 2011). Clustering is thought to give firms competitive advantages through higher productivity and levels of innovation, resulting in more jobs, new business ventures and products and services available on the market (Foster Forthcoming; Glaeser and Gottlieb 2009). The premise of this thinking is the requirement for spatial - to reduce logistical costs - and cognitive - attracting local labour, easy movement of skills and translation of knowledge throughout workforce - proximity (Cicerone, Crociata, and Mantegazzi 2021; Rodriguez-Pose and Lee 2020). A high agglomeration of creative occupations contributes to high growth firms emerging in a region, viewed as 'productive entrepreneurs' (i.e. creating employment) (Audretsch and Belitski 2021; Sleuwaegen and Ramboer 2020): creative industries are good for economic growth. Universities with strong creative syllabus attract, produce and retain future creative entrepreneurs in the region creating a mutually reinforcing relationship where graduates have the relevant skills, knowledge or 'entrepreneurial spirit' to contribute to local creative industries (Hauge, Pinheiro, and Zyzak 2018; Lazzaro 2021; Rodriguez-Pose and Lee 2020). In this version, the commercialisation of academic knowledge happens through proximity and talent pipelines; wider regional benefits happen as an aftereffect.

Foster (Forthcoming) argues that creative clusters are inappropriate mechanisms to support genuine creative-sector led development in cities and regions. Creative economies are not so sector-specific as clusters thinking suggests and in fact represent diverse economies, comprising freelancers, micro businesses, community and cultural organisations, DIYers, users, public agencies, universities, informal groups and businesses (Foster Forthcoming). With clustering's focus on economic goals to promote growth, jobs, etc., other forms of value that are important within creative sectors are made invisible and existing inequalities, in economic and cultural access terms, can even be widened through such policies (cf. literature on cultural regeneration).

A cultural ecologies framework, instead, seeks to understand innovation and value creation in the cultural and creative sectors beyond simplistic linear and economic models. An ecological approach concentrates on flows and feedback loops within a messy and dynamic constellation of actors and relationships that comprise the creative sectors and their wider regional or city-level contexts (Dovey et al. 2016; Holden 2015; Markussen et al. 2011). Unlike economic approaches, creativity, new knowledge and expression are understood to be distributed across the cultural ecology rather than emerging from an 'artistic core' (Holden 2015, 11) that then has to be transferred, commercialised or spilt over into the wider economy or regional innovation system. Cultural ecologies approaches seek to foreground different forms of cultural value and stress the

interplay of sectors forming much creative labour and career trajectories. Creatives rely on their networks to be alert to business opportunities and may have motivations and models of success beyond economic ones, including creative freedom, personal satisfaction and social impact (Chen and Tseng 2021). The diverse value generation of cultural ecologies, including their contribution to regional development, is not fully understood, partly because it is difficult to quantify in the way that clusters activity is (Standard Industry Codes, GVA) and therefore communicate benefits to policy makers. Creative ecologies thinking starts to understand the micro aspects of dynamic relationships in regional creative networks and develop the language to recognise different forms of value and exchange (Foster Forthcoming; Komorowski, Pepper, and Lewis 2021).

KE can mean working within new and uneasy relationships for both university and creative industry partners, operating within a range of power dynamics. Hauge, Pinheiro, and Zyzak (2018) identifies institutional barriers to university-creative industries KE such as different language used, norms, and goals for collaboration. Universities have been described as brokers to help communicate shared goals and as holding overview knowledge of what universities and creative businesses need to create regional innovation (Hauge, Pinheiro, and Zyzak 2018). Creative-led cross-sectoral KE programmes have potential to exploit creative businesses (who tend to be more precarious, operating with smaller profits and resource) when they come into collaborations with industries with different business models and logics. Adding 'creativity' into the KE mix can lead to 'fast innovation,' changing the pace and goals of usual academic practices and imposing an operationalising of creativity for the economy through quantifiable measuring of impacts and expectations around commercial outputs, also recreating issues of precarity and lack of diversity that already exist within creative industries (Moreton 2018, 335).

For the most part, there remains a hierarchical relationship within KE framings where the university is the holder of knowledge in regional networks. This is evident in a recent AHRC funding call with its focus on 'translation' of Arts and Humanities research expertise to support public and community focused organisations in culture-led development. KE is often understood differently, however, by academics and KE teams carrying it out (Tindall 2020; Hayter, Rasmussen, and Rooksby 2020). As 'expert intermediaries' (Gibson 2015), university academics and KE managers are doing far more than facilitating linear knowledge transfer; as 'meta experts' (Brenneis 2012) who advocate, bid for and deliver creative KE programmes they also shape how future creative KE happens. They are 'active agents in making the creative economy known", drawing boundaries around the regional context, and translating discourses for and with policy-makers' (Gibson 2015, 476). Informal KE involves often-mundane activities relating to contracts and university finance departments, coalition building, and soft skills such as providing emotional support for creative businesses operating in highly precarious environments (Munro 2016, 2017; Moreton 2021). Universities become caretakers or stewards of the creative economy as well as a talent pipeline (Moreton 2021). Moreton (2021) asks for vigilance in how problematic concepts of creativity might be reinforced through KE programmes even when they have the most supportive and progressive intentions. He argues that university-creative economy KE must be embedded, non-hierarchical, ethical and multivalent in understanding and enacting creativity (2018, 335; see also Mould 2018). SWCTN aimed to create a KE programme with these values.

3. Method

There are two layers to the methodologies SWCTN used outlined below. The first is the methodology of cohort-led KE. The second is the evaluation methods used by the research team to assess the success of the KE programme and establish its impacts.

3.1. Cohort-led creative KE

SWCTN's methodology stemmed from previous KE and R&D collaborations between members of the partnership, specifically UWE and Watershed (Dovey et al. 2016). Creative KE brings an interdisciplinary cohort together with a focus on creative processes and outputs from its knowledge exchange activities. As identified by Moreton with reference to a different UWE-Watershed-led creative KE programme '[t]he central tenet of the approach was that by bringing together practitioners from different sectors, disciplines and communities, networks could be aggregated to increase mutual support, serendipity, new work or ideas exchange, and resilience by mobilizing connections between microbusiness and freelancers' (2021: 279). This form of cohort-led approach seeks to foster:

> …the kind of hyper-connectivity between people, disciplines and technologies that creates a great deal 'more than the sum of its parts'. Modelled on principles of Open Innovation, it also places care for its participants, and generosity of ideas and skills as central to its operation' (Dovey et al. 2016, 10).

The practice of cultural ecology put into action by SWCTN is underpinned by the belief that diverse groups of people and talents produce more innovative and inclusive outputs.

Cohort-led programmes are relatively new in the UK university KE context and do not resemble other forms of KE like industry-based PhDs, although they might be compared with academic funded thematic research networks. The process has been developed outside the university context and adopted in university projects *via* the partnership between UWE Bristol and the Watershed (for more on this partnership and the distinct creative KE model that has evolved see Lansdowne 2016 and Moreton 2021, 279–280). Creative KE cohorts are intensive, co-produced and embedded in an ethic of diversity, inclusivity, generosity and trust-building, as a supportive and safe transdisciplinary space/community.

SWCTN cohorts comprised academic, new talent and industry fellows, as well as teams developing prototypes (sometimes including fellows). All fellows are funded and expected to complete an independent piece of R&D as well as participating in and collaboratively steering interactive workshops. Like other formal creative networks, SWCTN involved mentoring, business support, and offered coworking space *via* Watershed and Kaleider residencies, but there was a recruitment process rather than operating on a membership model; the cohort is curated to purposely bring together a socio-demographic, disciplinary and sectoral mix.

SWCTN funded 75 fellows across three cohorts over three years with a focus on R&D themes identified as having scope for innovation and disruption within the creative technology sector: immersion, automation and data (see Roberts et al. 2021 for detail). Over 100 participants had funding, interacting with core SWCTN activity like workshops, demonstrations, university facility tours, and seminars. The wider

network (reflected through newsletter membership) that these participants were linked to was made up of 630 members, including researchers, artists, technologists, businesses and practitioners from across the region.

The UK was plunged into a series of national lockdowns due to the global coronavirus pandemic just as SWCTN entered its final year. The team had to adapt content and delivery quickly, moving online, to be able to continue planned activity.

3.2. Evaluation methods

Alongside programme delivery, we evaluated our successes and strived to continuously improve the programme for funded participants by feeding key findings from interviews with participants back to the delivery team as they designed the next cohorts' workshops. SWCTN is unique in this sense as researchers are embedded in the production process, working alongside the delivery team, gathering data to improve the process as well as 'research' data.

This paper's findings derive from three data sets: (1) Annual surveys of the whole network to find out who participants had connected to meaningfully and what types of outcomes resulted from these connections (e.g. new commissions, new publications); (2) 57 in-depth, semi-structured interviews with cohort members, designed to find out how and why people were connecting, to better understand how SWCTN was supporting different mechanisms for KE. Interviewees were asked to reflect on what they enjoyed, valued and found most challenging about the workshops and wider programme of events and support that each cohort received. Ongoing, iterative learning and evaluation took place through KE within SWCTN's delivery team and executive board meetings over the course of the programme. (3) Towards the end of the programme an open text survey was conducted with the SWCTN team to more systematically capture learnings across partners, and across academics and delivery team members. Qualitative data was coded using NVivo with first order codes of 'new connections', 'impacts' 'positive feedback' and 'negative feedback'. An emergent coding process was used to understand the learnings, types of connectivity, spillover and micro-dynamics of creative KE within SWCTN, and forms the basis of the analysis that follows.

4. What impacts do regional KE networks have?

Understanding the range of value and values, and the micro-relationships in any cultural ecology is essential to understand how KE programmes can support capacity building and values-led modes of development to thrive. This section examines three impact contexts to provide this wider analysis: university-industry KE, cross-sectoral KE, and impacts experienced at the personal level.

4.1. Non-hierarchical and multi-directional university-industry KE

Academic fellows used their experience participating in the activities of SWCTN's themed cohorts to radically change their research and teaching, their interactions with university colleagues and by bringing industry partners into the university, contributing to growing the regional creative technology talent pipeline.

SWCTN's focus on the ethics and inclusion aspects of technology enabled different types of thinking to enter into academics' own research practices and graduate syllabi, providing challenges and contrast to student's and researcher's own beliefs and values. Participation gave academics new forms of knowledge that they could share with students as well as access to expertise to inform their syllabi, providing students with an insight into the current needs and realities of industry, aiding entrepreneurial and industry-ready student experience (Agusita and Ashton 2020). It enabled them to broaden students' understanding of what an inclusive creative technology sector could look like and of viable businesses forms within that context.

> I have been able to use a lot of the fellowship to bring in some really good expertise into the course, which has been really, really exciting for the students. (Immersion Fellow)

> Some of the stuff that I've been looking at in relation to my project is… ethics-based identity politics… I'll definitely reorganise the way I'm delivering one of my modules to be braver, and to be more discursive, following my experiences of this. (Data Fellow)

Being invited to deliver guest lectures provided industry fellows new employment, a diversification of income streams, and experience of working in a new environment.

> One of the academic fellows … asked me come and run a two-week intensive live coding course for the students…I am very excited to provide a creative narrative around learning to programme rather than an engineering or science background. (Automation Fellow)

This is an example of how university-industry cohort-led KE can contribute to more transdisciplinary approaches (bringing in non-academics) to teaching. Inspired by fellowship content, academics have become more interdisciplinary (working across disciplines) in their own research too.

> … my whole way of researching has… changed, which is great. I did not see myself more than just an architect that is interested in computers… but after the SWCTN cohort… I'm more comfortable explaining that I have expertise in pervasive media. (Data Fellow)

Inspired by fellowship content, academics have included more practice-based and trans-disciplinary aspects to their courses, and been able to update their courses, informed by current industrial state-of-the-art practices. They have been able to create new interdisciplinary PhD's such as a nature writing PhD based in a biology department, enter into existing university research groups previously outside their purview, create university-wide and cross-university thematic research groups that link STEM and A&H departments (see Resonant Ecologies Research Group led by UWE) and bid for new interdisciplinary research projects.

It is not only the content of their research and teaching that has shifted but also academics approach to it. Experiencing the carefully facilitated collaborative and compassionate space of the cohorts illuminated some of the pitfalls of the contemporary university.

> [Fellows] would point out things that they thought were really interesting, and it could actually just be like a word or a phrase or, I like the way you explained this… stuff I've done in the past it's too fast paced to sort of even think about stuff like that… every time I had a session, I would leave it just feeling really happy about my work… [I've] made an effort myself to try and do that a bit more with other people. (Data Fellow)

> [SWCTN] was a nice place where you could sort of explore and have a creative little bubble to step into and…. I really would like to replicate that in the MSc that I'm setting up… I see it in my students, they do not have that safe space to explore. (Data Fellow)

The current university-as-business can feel fast-paced and competitive. In contrast to the conventional wisdom that academia happens at a glacial speed compared to business, academic fellow's expressed gratitude for the breathing space from teaching commitments and opportunity to think about research and teaching practices, seeking to create more positive and safe spaces for feedback with colleagues and students as they had themselves experienced in SWCTN. Academics at one partner university have used this knowledge and experience to initiate the first creative hub on campus.

At university-level, KE can sometimes still be seen as something of a bolt-on or dissemination activity, although this varies by university. For many researchers, however, it is much more embedded in their research and they are motivated to participate in KE activities by a range of personal and professional peer-related factors including shifting professional norms regarding 'good academic practice' (Hayter, Rasmussen, and Rooksby 2020; Tindall 2020). This section has illustrated the way KE can impact academics' teaching and research, as well as rippling out into wider university and pipeline impacts. Rather than academics translating their expertise so that businesses can benefit, recreating a knowledge transfer hierarchy, creative cohort-led KE has resulted in new knowledge entering into the university, shifting understandings of knowledge, increased interdisciplinarity within universities, and non-hierarchical forms of exchange between university and industry.

4.2. Creative KE across different sectors: creative spillover or opening up silos?

SWCTN built long-term, meaningful relationships between creative industries and other sectors through its cohorts. For individuals from sectors like health, manufacturing, agriculture, the green economy and architecture, participating in a creative network has resulted in a wide range of value. Rodriguez-Pose and Lee (2020) argue somewhat reductively that you need 'hipsters' (creatives) and 'geeks' (STEM subjects) for the highest levels of innovation in a region because innovation results from the combination of symbolic, practical and analytical (codifiable) knowledge, whereas Markusen and Scrock (2006) describe an 'artistic dividend' – the added value creative industries generate for other industries. SWCTN cohorts engaged in reciprocal exchange between diverse sectors, informed by a spectrum of STEAM subjects. This sparked critical thinking, innovative practices and outcomes.

Our evaluation showed that this transdisciplinarity (mixing sectors and academic disciplines) was overwhelmingly valued.

> …my work life is very narrow…you tend to get narrowed down into a funnel and there aren't that many things that open up that funnel… So to have this thing where you're just exposed to totally, like music industry, academia, it's wonderful… (Data Fellow)

> …every programme where there is a slightly different point of view or a different demographic actually adds a hell of a lot in terms of your headspace, and way of thinking, and different people's thoughts on how to approach problems, which within our kind of niche realm can be fairly closed off. (Automation fellow)

Participants gained a wide range of benefits through being given the time and space to experiment with different modes of working and thinking, and collaborate with different types of people. Fellows felt inspired, more confident about their professional identities and practices, and more able to move into or work across different sectors.

> I would say it's definitely changed my career thoughts and options. It's definitely taken me in a direction that I haven't previously had the confidence to do and think about. (Data Fellow)

> …having had the opportunity to collaborate in that way with people who are from such different fields as from my own is an unusual experience for me and a really good one…. I think it would give me more confidence to set up more radical collaborations … (Data Fellow)

The cohorts transdisciplinary workshop themes meant that people were exposed to new thinking and opportunities and, significantly, they gained confidence to do this across other aspects of their working life outside the programme.

Individuals from industry and STEM disciplines who came into contact through their fellowships with artistic or design-led practices more familiar in the creative sector and disciplines 'opened up' their research, becoming more exploratory and introducing subjective, playful, experimental and user-centred aspects into their work. The cohorts brought participants into contact with critical voices, requiring some self-professed 'glorifiers of tech' to rigorously examine the social and ethical aspects of technology, realigning their prior standpoint by putting the human at the centre of design. This was particularly evident in the Data cohort for whom some of the individuals' participation involved a complete renegotiation of what data means.

> I think that those sessions were actually a severe provocation… you had your own pre-assumptions smashed into pieces, and everybody else's pieces are everywhere, and you've got to rebuild something that necessitates bringing in other people's pieces of the puzzle. (Data fellow)

> I have managed to think more widely about what data means and what can drive a design process other than, you know, numbers. (Data Fellow)

One industry representative came in 'with a rational objective-type viewpoint' (Data Fellow) from a background in health science. SWCTN peer support and feedback gave her confidence and permission to consider data in more subjective and experimental terms and include more creative elements in her work. She now works with two artists and has a restricted fund within her business looking at how artists and makers can support healthcare, also hiring a creative assistant.

Another health professional entered the data cohort with the intention to improve her health app with data-driven research the NHS needed. Her thinking shifted to incorporating a more holistic and patient-centred approach to the app focusing on user co-design workshops.

> …half of us were researchers or engineers, whatever. And then the other half were, like, you know, hippie artists. So you've got this amazing clash, where genuinely, like, they made us think differently, right? … the artists… would ask really deep questions… I really learned from SWCTN… it's okay to dive down the rabbit holes. (Automation Fellow)

This fellow gained significant angel investment following her reorienting to a cohort-inspired, user-centred approach.

While this section has demonstrated a clear artistic or creativity dividend for the other sectors involved in SWCTN, creative freelancers, businesses and academics from arts disciplines benefited by gaining new transdisciplinary funded collaborations (see Roberts et al. 2021 for details), exposure to different spheres of creative problem solving (as creativity is not the sole purview of the creative sector), as well as

contextualising their work within wider research and development methodologies. As with the industry-academia example, the connections emergent from the bringing together of a curated, diverse group have been reciprocal and enabled 'big picture' and ethically-framed thinking to happen across sectors rather than a linear spillover of a narrow version of, or way of valuing, creativity into other sectors.

4.3. Personal and intangible value in SWCTN

The conditions created and curated by SWCTN team members to support the cohorts – diversity, safety to take risks, support and mentoring, deep-thinking time – enabled fellows to change their ways of thinking, practicing and working. They grew in confidence around understanding and describing their own expertise, with a large number in the cohorts pivoting towards career and life changes. Fellows quickly gained large amounts of new knowledge and skills from the cohort and were able to trial different R&D methods. For some, the process shifted their whole approach to R&D; some rethought their entire practice, broadening their perspectives and the types of collaborations they seek. This cohort-led KE approach highlights how innovation and impact are not linear processes with fixed inputs and outputs: funding does not have only a direct and corresponding output, but results in multiple serendipitous or unexpected outcomes that increases novelty and cross-fertilisation of ideas.

Fellows valued most the deep-thinking time that SWCTN enabled. Feedback from them was clear that similar paid, exploratory research time was rare within the creative and academic sectors, especially for freelancers who constantly had to be looking for the next contract. Having time away from teaching demands or the day-to-day time pressures of industry work allowed for reflection and strategic planning related to R&D.

> …just having that breathing space, especially having come off a very time-pressured project… ultimately, it enables us to just be more creative, because we've got the time to actually be creative. (Immersion fellow)

> And then, it also allowed me to find what I enjoyed about what I do again… the past couple of months everything has been realigning…I think it's about really thinking what my career could be like. (Data fellow)

> I've been given the time and the space to really feel confident calling myself an artist. (Automation fellow)

This deep-thinking time, viewed in opposition to grants driven by narrow outcomes and 'box ticking exercises,' allowed cohorts to step back and think holistically about the direction of their business or careers, re-engage and find what they love again, or re-orient themselves professionally through learning and collaborating. This highlights the importance within KE programmes of allowing time and openness or non-linearity in terms of not over-determining the end point or what success might look like for an individual, business or collaboration. Support and care are equally significant factors to lead to individuals creating or sustaining their careers after participation in a KE programme.

The curation of the cohorts and on-going creative producer support for each of the cohorts, gave fellows the feeling that they were in a collegial and accessible space, but that they were also being pushed out of their comfort zone.

> As somebody from an outsider background I felt incredibly supported by the fellowship network. I feel like it has been a safe place to take risks. (Immersion Fellow)

The support and sense of belonging that SWCTN provided was particularly timely for those who work alone, such as independent freelancers, those who worked in remote locations, and those that were changing roles to 'go it alone'.

Often fellows' research direction shifted around a particular, serendipitous 'light bulb' moment when ideas crystallised. The project's facilitation of connectivity between diverse people, interests and sectors enables these light-bulb moments. Network building was at the heart of SWCTN activity and it was what members of the network reported most appreciating in their feedback. Fellows valued the breadth of SWCTN and how that opened doors beyond.

> I've made tons of really good connections… and more than that, you know, proper relationships with people, which is hugely valuable. Being a data fellow…feels like a sort of passport… To having a conversation with somebody in that network…. (Data Fellow)

> I think the strange thing about those networks is you only need to make one strong connection… that one person can then open up an entire new world that you couldn't even possibly then describe every relationship that's grown out of that. (Data Fellow)

> I am using the SWCTN fellowship as a kind of… I guess a stamp of approval. So it is opening doors by using that kind of leverage as well. (Automation Fellow)

SWCTN was valued for how it expanded people's networks and was also seen as a passport or as an indicator of prestige, which opened further doors and leveraged the collective expertise of the network to benefit individual fellows. Fellows valued SWCTN for growing their networks, lifting their confidence and ability to pivot, and providing a sense of belonging to a community in which it is safe to take risks and collaborate radically. These forms of value can be evidenced but not so easily given an economic value, although they increase the likelihood of all the forms of economic growth that SWCTN measured and reported back to its funder, as well as the ability of R&D funding to respond to current environmental and societal problems.

5. Power, micro-dynamics and unequal knowledge exchange in SWCTN

This section explores how power and expertise circulated in SWCTN and how this played out in the sites and micro-relations of the Network's cultural ecology, specifically in the role of universities and the tensions between economic and other value(s) supported in the network.

Power circulated through the micro-dynamics of organisational knowledge exchange, specifically between academic and non-academic organisations, experienced at team level and within the cohorts. The SWCTN team reported that qualities of trust and respect were actively fostered across partners throughout the project, which allowed for a good level of KE - collaboration and communication (sharing) - between partners, with plenty of good will to be equal, non-competitive partners, and operate a model of collaborative decision-making (Team evaluation). However, some of the partners more peripheral to the core delivery team felt that this sometimes appeared 'cosy' and 'in the know' rather 'transparent and rigorous' (Team

evaluation) and it was felt that non-academic partners were subject to greater responsibility and scrutiny resulting in uneven weighting of labour across SWCTN's partner organisations.

Communication and information sharing at regional scale did prove a problem, especially as funding and decision-making was devolved to partners at later stages in the programme, because the responsibility of reporting was still held by the lead organisation. Localised information did not always flow back smoothly (exacerbated by the Covid-19 pandemic and limited opportunities to meet up) which meant that the diverse impacts and the ability to evidence return on investment for the funder, as well as collective learning, was hindered and meant that new mechanisms of data collection had to be developed.

The micro-relations between fellows in the cohorts was another site in SWCTN where power was constantly being renegotiated. The early workshops programmed into cohorts were exciting but nerve-wracking experiences for fellows, meeting a new and large group of people and establishing their place within that. While the SWCTN team used the cultural ecologies approach of care, respect, etc., to make every fellow feel welcome and of equal value, many fellows understood the power in the room/Zoom differently.

> What I love about this fellowship is, it's kind of an opportunity to remove that awkwardness about what's the value of everybody. You're a junior, you're an expert, it does not matter, we're all in here. (Data Fellow)

> … it's quite a scary space to go into though because, you know, you have all these like architects and designers, and people who have a lot of money behind them, and have big studios, and have [costly] robots… and I am like… I'm a mum of two small children, who works basically in a shed in her back garden. (Automation Fellow)

> I absolutely hated it… It just felt very intellectual… there was a few people in the cohort who are very vocal and they can end up intimidating some of the people who are not academic. (Automation Fellow)

As with any group, group dynamics and 'power plays' were at work in the cohorts. To some extent, centring the subject matter of the cohorts on a theme made KE more effective, and levelled the academic/non-academic playing field (Team evaluation); however, in each of the three cohorts, fellows reported finding academics dominant and intimidating. Fellows entering the creative technology field were sensitized to their newness and comparative lack of knowledge to established industry and academic fellows.

This sometimes led to unequal exchanges (of knowledge, time, resource) between the different types of fellows, as well as a sense of imposter syndrome. Discussing the focus on research principles in earlier workshops, one fellow commented 'I wonder whether that reinforces this idea that we're looking for university-level research, which I don't think for the new talent people or the industry people, is appropriate' (Immersion Fellow). This led academic fellows to feel they were being pulled on by the other fellows in a mentoring and teaching capacity to bring them up to pace with academic approaches.

Another concern voiced was the differing expectations between sectors and work practices around what was fair to ask of someone. Academics generally work within a fixed salary whereas others are used to day rates, for example. A tension was present around what was an economic form of exchange and what held other forms of value, often depending on how equal the exchange was.

> One of my issues, because I'm in academia, time is not really seen… it's very ambiguous to know what to start charging for. I just love collaborating, but I know it's a different thing to ask my friends who I make [in SWCTN] for their skills. (Data Fellow).

> I got a reputation… of being a fundraising bitch … I started off wanting to share that information quite openly, then I got fed up with it… So I withdrew a bit from the fellowship as a whole. I charge £500 a day if you want that. (Immersion Fellow)

These issues played into the way that academics and non-academics could collaborate in the network, with the fellows having different norms and protocols for working. For example, academics have a strict ethical protocol to follow in any research project that an artist would not necessarily have.

SWCTN aimed to create a KE programme that was 'non-hierarchical, ethical and multivalent in understanding and enacting creativity' (Moreton 2018, 335), also meeting its funder requirements to create new products, businesses and leverage income for the region. Each cohort contributed to co-writing a prototype funding call for businesses to develop a new product or service responding to the issues and questions posed by the cohorts combined deep-thinking. Fellows were welcome to apply with appropriate ideas but the process represented a moment of change and unease in each of the cohorts, shifting away from a collaborative, group dynamic to perceived as putting fellows in competition and conflicting with the cultural ecologies ethos they had experienced up to that point.

> [Fellow] just pretty much started with, "Well, you know, as long as we don't fund anything that's art for art's sake. It's got to be something that actually does something … it's got to have some real impact." …we were just like, "Are you saying artistic practice has no value or impact?" (Immersion Fellow)

> …because everyone's coming from that kind of academic vibes, conversations about what's your return on investment… don't really go down that well. (Data Fellow)

> I think it brought up some of the dilemmas that the whole process is facing. In particular, this chasm between the very open research, artistic flare-based explorations of the fellowships with the overall remit of making money and commercial ventures. (Immersion Fellow)

There was a tendency to pit artistic with economic value within the cohorts, due to the transdisciplinary mix of the cohorts and, perhaps, the cultural ecologies approach with its efforts to privilege diverse forms of value, which was highlighted by the prototype call co-writing process.

The prototype process also brought into question the trust that was built between the cohort and SWCTN team based on the principles it had established, with one fellow describing it as engagement for engagements sake and another fellow identifying huge conflict of interests. An academic fellow regretted the disconnect between the fellowship and prototype parts of the cohort, claiming businesses had no motivation to benefit from the wealth of research carried out in the cohorts. This was echoed by SWCTN team members who wished the two parts had been more integrated and overlapped (Team evaluation). While the role of creative producer was understood and appreciated in the cohorts, as a fairly new role, the KE managers' role remained ambiguous and somewhat invisible to cohorts. The team worked hard to improve the clarity of the KE offer and build KE managers' skills, but the disconnect

between the two R&D phases may have been reduced with stronger KE across partners and understanding of how to utilise it by cohorts.

A final and perhaps most significant way in which power circulated was in SWCTN's attempts to strengthen its inclusivity and accessibility. Both the creative sector and universities have been well documented for their lack of inclusivity (Finkel et al. 2017; Taylor & O'Brien, 2017). SWCTN began in earnest with particular goals to be diverse in its cohorts and to promote inclusive creative technology. Through the course of its programming, and accelerated by the Black Lives Matter movement and the global pandemic, the team realised that was far too limited, evidenced in these Team evaluation responses:

> We have gradually got better at more inclusive recruitment with a wider range of people from different backgrounds attracted to the call and a good process involving inclusive reviewers, short listers and interviewers… but there is a lot more work to be done on this.

> Inclusion is something I think we should have addressed earlier and specific and focused efforts from the start to include people from more diverse backgrounds. In [partner organisation] we attempted to do this… but it came too late to have a real impact.

Fellows recognised the efforts being made, with one Data fellow noting how she was pleased to see so many other black women in her cohort, but several exclusionary incidents were also reported and a stark difference was noticed between the diversity of the cohorts and that of the team and governance structures that supported SWCTN. In their review of inclusion in SWCTN, Adelaide et al. (forthcoming) identify that there was a disconnect between fellows valuing the significant efforts made by individual team members within the partner organisations and the perceptions of the organisations as places and as arenas in which policy, governance and structural change plays out.

The two creative production studios were viewed as pushing forward inclusivity within SWCTN (Adelaide et al. forthcoming) in a way that was not as recognised in the universities, partly due to scale and bureaucracy involved in large organisations to affect change. The team had aspirations to create dialogue and two-way exchange around SWCTN inclusion approaches. However, contradictions exist within SWCTN inclusion strategies, with one fellow recognising that the places of SWCTN, i.e. locations in which fellows met up were not as inclusive as SWCTN's inclusion aspirations might suggest.

> I'd also hope that our work on inclusive governance, best practice around inclusion, and the recommendations of the inclusion reports will be able to drive organisational change. (Team evaluation)

> I think a lot of organisations in Bristol are very good at branding themselves as being these open, diverse, inclusive organisations… but then when you actually go into the offices, or see… the powers operating within them, it's not that, sort of, representative as they like to make out… Watershed is one of the better ones, for sure. (Immersion Fellow)

SWCTN has made meaningful changes in the inclusivity of the creative technology sector in its KE and R&D processes; however, as a region, the South West UK represents broad differences in demographics across the places involved which also means a uniform policy of inclusion will be enacted differently across the region. SWCTN only scratched the surface in creating a legacy of more inclusive future

funding opportunities, organisational structures, governance and talent pipelines in the region (, Forthcoming.).

6. Building more equitable, non-linear and non-hierarchical creative KE for regional innovation

SWCTN's research evaluation through surveys and interviews demonstrated that the mix of voices and backgrounds in SWCTN cohorts was experienced positively by the majority of participants and exposed everyone to different people, sectors and approaches than they would ordinarily have access to. Specifically, this contributed to creative thinking through learning about how others tackled problems differently and through transdisciplinary workshops facilitated so that the range of sectors and disciplines 'in the room' could meet/productively clash at a middle point.

SWCTN was largely successful in fostering an environment for creative technology KE and R&D that privileged care, ethics, community, creativity and play, participatory and human-focused design, but it also struggled to reconcile this with its commercial fulfilments to its funder to create high growth products and businesses. While SWCTN's goals were limited by the scale of its activity and the constraints of its funding, it did provide a space for change and transdisciplinary 'shock' for those involved, radically changing many fellows' perspective and business trajectory; a process which has potential to scale across creative sectors and beyond.

This paper has demonstrated the different forms of value emerging in KE programmes – finding the language to describe them - and how these develop through the micro-dynamics and exchanges of diverse cohorts. Building connectivity, confidence and capacity is a key impact of such programmes, as a result of non-linear and multi-values led activity and support, that is unmeasured and undervalued in normative evaluation of KE programmes. Traditional notions of linear knowledge transfer oversimplify the complex and dynamic processes involved in creative innovations. The paper demonstrated how KE programmes that foster creative networks produce non-hierarchical and emergent KE, having immense impact for the way academics and universities develop knowledge and support talent pipelines, as well as facilitating KE between creative sectors and businesses without university input. However, these spaces are undoubtedly contested.

The paper has also flagged the potential power imbalances that exist in university-creative industry KE programmes, and how that acts as a barrier to collaboration and innovation. When different modes of value remain understood as equivalent to economic transactions, network participants can end up feeling that they are being exploited under a creative ecology rubric of care and generosity which is prioritised in the shared values of the network. The tension between collaboration and competition (for additional funding) recreates problematic neoliberal discourses around 'collaborative individualism' (Bandinelli et al. 2019). SWCTN evaluation found that inclusion processes need to be built in from the beginning of such programmes to be understood as meaningful by participants and suggests that further research to understand how inclusion work might impact differently across sectors and regions is needed. It shows how linear funding models with narrowly defined outputs put limits on the kind of creativity and innovations that emerge when 'diversity is crowded', and how these

approaches close off opportunities such as networking, radical transdisciplinary thinking and serendipitous moments that cultural ecologies inspired cohorts enable.

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Liz Roberts is a cultural geographer who has worked at the intersection of social science and arts and humanities across a range of interdisciplinary projects. She is currently working as a Senior Research Fellow in the Creative Economies Lab, University of the West of England, working on two major regional R&D programmes for the creative industries. Her current research interests include knowledge exchange in the creative industries, responsible innovation, creative technologies, and alternative economies and ways of doing business that enable more sustainable and fair creative economies (and societies).

ORCID

Liz Roberts ⓘ http://orcid.org/0000-0001-8983-0227

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