Designing an Interdisciplinary Research Culture in Higher Education : A Case Study

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Design methods and processes are now commonly used across disciplines as an approach to gain deeper and more connected understanding within complex or wicked problems. However, little research exists on the use of Design to facilitate and grow interdisciplinary research culture within higher education institutes. This paper discusses how and why Design methods were used to create an interdisciplinary research culture in a newly emergent and rapidly evolving higher education environment. It uses a case study of a teaching orientated higher education institute, now moving towards Technological University status, and seeking to create an Interdisciplinary research culture. It discusses the process of using Design to create a unifying research identity, Design methods in mapping and framing of research landscapes, designing dissemination platforms, and Co-designing future research policy for the institute.

Keywords: interdisciplinary research; research culture; design thinking; Co-design; design methods; higher education

Introduction

Interdisciplinary research is increasingly being encouraged within higher education institutes. Internationally, in many large funding calls, there is a growing requirement for multiple researchers to work across disciplines to address complex research questions that face society. The European Commission for example, through its Horizon research and Innovation programme, promotes the "…bringing together of resources and knowledge across different fields, technologies and disciplines" using a "challenge based approach" to create new research discoveries {European Commission, 2014, Societial Challanges, para.1}. According to the Irish Research Council this challenge based approach "…does not align neatly along

disciplinary lines, and the overall focus is about contributing to solving complex external problems rather than adding to the knowledge base within the discipline" {, 2018, Workshops to cultivate Interdisciplinary Research in Ireland: Call for Proposals from Research 2nd Call for Proposals from Research-Performing Organisations, p.3}. There is also a growing requirement within future funding streams to be both interdisciplinary and inclusive. For example, the Tri agency fund in Canada focuses on international, interdisciplinary, inclusive research with support for early career researchers. {Government of Canada, 2018, Canada Research Coordinating Committee launches consultation (creating a new tri-agency fund)}

The growing need for interdisciplinary research could pose both opportunities and threats for higher education institutes with a new or emergent research culture. Established universities with long serving research capacity can, for example, establish interdisciplinary groups with greater ease, for younger institutes this can be more challenging. However, within these settings there is an opportunity to create unique and sustainable interdisciplinary research cultures that can grow and nurture over time, and this is the case for Irish higher education institutes.

Ireland's higher education is under reform, Technological Universities are currently under development with the amalgamation of current Institutes of Technologies. With this reform, new research cultures will be created. According to Pratt et al, "…many newly designated universities have their origins in applied and vocational disciplines where there is a stronger focus on teaching than on research" {, 1999, Developing a Research Culture in a University Faculty@43}. This is precisely the case with Irish Institutes of technologies.

However Technological Universities will be a new form of higher education institute in Ireland with an emphasis on research that addresses regional, national, economic, and social needs {Irish Government, 2018, Technological Universities Act 2018}. For Institutes

of Technologies transitioning into Technological University status, creating sustainable research cultures can be challenging, and may require creative means to progress.

This paper discusses why an interdisciplinary research culture should be created, and why these cultures should be purposefully designed. It outlines a case study of an Irish Institute of Technology now moving towards Technological University status, and describes how the use of Design methods has facilitated this. In reflecting on this process, it offers benefits of using Design methods in creating interdisciplinary research cultures.

Interdisciplinary research

According to Jensenius, interdisciplinary research is the integration of "…knowledge and methods from different disciplines, using a real synthesis of approaches" as distinct from multidisciplinary research where people from differing disciplines work together "…each drawing on their disciplinary knowledge" {, 2012, Disciplinarities: intra`, cross`, multi`, inter`, trans, para.1}. Interdisciplinary studies therefore draw upon researchers across disciplines to address problems that may be too complex to solve or understand within one discipline. Repko describes it as "…a process of answering a question, solving a problem, or addressing a topic that is too broad or complex to be dealt with adequately by a single discipline" {, 2008, Interdisciplinary Research: Process and Theory, p. 16}

Interdisciplinary approaches are generally used in situations where the removal of disciplinary barriers is required, where a common consensus across disciplines is necessary to address a complex or multi-faceted issue. The intent of interdisciplinary approaches is to lead researchers to think differently and to find novel ways in addressing problems that are seen to be difficult to previously surmount.

According to Davoudi, interdisciplinary approaches are advantageous when a means of dealing with complex, 'wicked' problems is required to be provided, and when real world

research problems require a synthetic and integrative approach {, 2013, Interdisciplinary research: benefits and burdens}. Other advantages lie within achieving robust evidence from research findings. With differing lenses involved in an integrated approach, increased evidence in findings could be sought through cross validation of findings, and interpretations, through holistic oversight.

With a continuing push to create, transfer, and translate new knowledge within academic organisations, interdisciplinary approaches are being encouraged to produce novel outputs and to address complex societal problems. As mentioned previously, many research-funding bodies also seek an interdisciplinary focus within grant award applications, seeking a diverse consortium of researchers across disciplines with varied skillsets and methodological approaches. Recent examples from an Irish context include calls from Horizon 2020, the Irish Research Council, Health Research Board of Ireland and the Health Service Executive of Ireland.

Design in interdisciplinary contexts

So why are Design methods seen as beneficial within interdisciplinary contexts? Primarily this is because Design is a deeply 'human' activity. At a base level, most people have the capacity to be creative whatever the disciplinary context. Robinson & Aronica argue that "…creativity is possible in all areas of human life, in science, the arts, mathematics, technology, cuisine, teaching, politics, business…" {, 2015, Creative Schools: The Grassroots Revolution That's Transforming Education@118}. Arguing this point in terms of Design, Cross states that "everyone designs" as a it is inherent in human cognition {, 2011, Design thinking : understanding how designers think and work} therefore, Design and creativity are very human activities both physically and cognitively. Design processes are also human

centric and collaborative, Buchanan states “Design is a remarkably supple discipline, amenable to radically different interpretations in philosophy as well as in practice” {, 1992, Wicked Problems in Design Thinking@16}.

To accommodate interdisciplinary research, Design processes are adaptive and iterative, diverging and converging in a non-linear process. This approach allows researchers to objectify subjective bias and to use empathic methods to understand a problem from differing point of views. As a result of this, Design research has positioned itself across a wide spectrum of disciplinary and interdisciplinary perspectives.

Design is also suited within interdisciplinary contexts as they both share a requirement for ‘T shaped’ research practice. ‘T’ Shaped researchers are those who can work broadly across disciplines and deeply within their own discipline. Kelley & Littman reinforces the importance of T shaped individuals in Design practice, referring to them as ‘Cross-pollinators’ on a team; collaborators who create associations between unrelated ideas or concepts to break new ground {, 2006, The Ten Faces of Innovation: IDEO's Strategies for Beating the Devil's Advocate and Driving Creativity Throughout Your Organization}. Hansen & von Oetinger state that …interdisciplinary collaborations have the greatest chance of success when researchers are T-shaped as they are able to cultivate both their own discipline and to look beyond it too {, 2001, Introducing T-shaped managers. Knowledge management's next generation}. Brown, Deletic, & Wong place them within 5 key principles within successful interdisciplinary teams; stating that they engage actively to understand and appreciate other disciplines norms, theories, approaches and breakthroughs {, 2015, Interdisciplinarity: How to catalyse collaboration}

Evolution of Design Methods for Interdisciplinary Applications

In the last 50 years Design methods have evolved extensively within interdisciplinary

applications. From the 1980's, there has been continuous research into the thought processes of Design practice and the democratisation of Design as an interdisciplinary research approach. Popularising this has been the development of Design Thinking, the thought and behaviour process derived from Design practice {White, 2012, Designer as Ethnographer: A Study of Domestic Cooking and Heating Product Design for Irish Older Adults}. Design Thinking is now commonly used within organisations as a problem solving methodology for innovation, and for finding pathways for new products and services {Gaynor, 2018, How Design Thinking Offers Strategic Value to Micro-Enterprises;Gaynor, 2018, How Design Thinking Offers Strategic Value to Micro-Enterprises}. Design Thinking has been applied to a vast array of research problems, from redesigning organisations to operate more efficiently, to redesigning more inclusive products and physical spaces {Vrkljan, 2019, Creating an intergenerational university hub: engaging older and younger users in the shaping of space and place;White, 2011, The Design and Development of Novel Cooking and Heating Products for Irish Older Adults- a Real Health Need;White, 2011, The Design and Development of Novel Cooking and Heating Products for Irish Older Adults- a Real Health Need;White, 2013, Ethnography in Design for Older People}

Today, Design can be seen as an interdisciplinary composite that is continually evolving and emerging. It is a developing research discipline in its own right, continually looking at other disciplines to evolve and understand itself by adapting methods and approaches from other disciplines, namely Sociology, Anthropology, Business and Engineering. These crossovers are reciprocal, with disciplines that appropriate Design methods benefiting from the creative, adaptive and human centric qualities of its processes.

Knowledge Gap

Despite the advantages, little research exists into the use of Design approaches to facilitate and grow interdisciplinary research culture within higher education institutes. This knowledge gap extends from newly created to pre-existing research groups, and across all disciplines. However, from a methodological perspective, Tobi & Kampen have designed a 'Methodology for Interdisciplinary Research' (MIR) framework. This framework is constructed to facilitate the design of interdisciplinary scientific research, and to assist research groups intersect and cross over disciplinary borders {, 2017, Research design: the methodology for interdisciplinary research framework}.

Literature into the design of interdisciplinary programmes, courses and content within the educational environment is also available. For example, Newell offers a guide to achieve this, from assembling teams to structuring courses {, 1994, Designing interdisciplinary courses}. Similarly, De Greef et al., in their handbook Designing Interdisciplinary Education {, 2017, Designing Interdisciplinary Education A practical handbook for university teachers}, offer a guide for teachers to create interdisciplinary programmes and courses. At a curriculum level, Leonard, Fitzgerald, & Riordan, utilised Design approaches in curriculum development in higher education {, 2016, Using developmental evaluation as a design thinking tool for curriculum innovation in professional higher education}.

The Case Study

This case study is a description of a higher education institute using Design methods to create an interdisciplinary research culture. The case study involved over 120 researchers across 5 different disciplines and research centres. Through user centred design and co-design methodologies it engaged the research community in interdisciplinary collaborative actions to inform findings. It used several iterative stages in the process of doing this, from designing a

unifying research identity, mapping and framing of research landscapes, designing dissemination platforms, and Co-designing future research policy for the institute.

This case study is based in at the Institute of Technology Carlow, Republic of Ireland. The institute was established in 1970, and now has approximately 7000 learners. It has a newly emergent research culture with the formal recognition of research centres in 2014.

Initiated in 2015, this research is the commencement of a longer study seeking to understand:

(1) How can Design approaches assist researchers build knowledge together within interdisciplinary contexts?
(2) How can Design be used to create an interdisciplinary culture within a higher education institute?

This paper outlines the first phase of engagement at the institute.

Background Context: Design and Research at the Institute of Technology Carlow

The Institute of Technology Carlow (I.T. Carlow) was the first higher education institute of its kind in Ireland. Established in 1970, the construction of a Regional Technical College (R.T.C.) at Carlow saw the commencement of a new type of learning environment, one which sought to primarily "...educate for trade and Industry" {Mulcahy, 1967, Irish Government Steering Committee on Technical Education (Report to the Minister for Education)@11}. In response to the demand in growth for both craft apprentices and Art and Design in Ireland, Carlow R.T.C established Design education from its inception. The demand for art and craft practitioners at this time correlated with government initiatives seeking the growth of creativity within Irish industry. In nearby Kilkenny city, The Kilkenny Design Workshops (K.D.W) were established as a creative hub for this activity and until its closure in 1985,

Carlow graduates transitioned to K.D.W, and in later years , designers returned as lecturing staff {Dempsey, 2015, A culture of universal empathy in design at the Institute of Technology }. Carlow R.T.C. transitioned to Institute of Technology status in the late 1990s. It has since then, continued to develop and deliver undergraduate and postgraduate programmes specifically, Industrial design and Product Design Innovation.

Due to the increase of research activity in Carlow, 2011 saw the establishment of designCORE (Design Centre of Research and Enterprise) with research spanning both academic and industry applications. designCORE began to specialise in Human Centred Design approaches and since has developed its interdisciplinary reach into Anthropology, Psychology, Business, Health Science and Engineering. designCORE now classifies all its interdisciplinary activity broadly within the boundaries of Design for Policy , Society and Industry. The publication of the I T Carlow Strategic Plan 2014 – 2018 sought to expand research capacity and to "…develop expertise within specific core domains" within …themes in line with national and European objectives, and maximise opportunities for new multi- and inter-disciplinary links and initiatives" {Mulcahy, 2013, Institute of Technology Carlow Strategic Plan 2014 - 2018: inspiring individuals transforming society, p. 18}. As a result of this, there was a consolidation of research activity into formal research themes, and the CORE (Centres of Research and Enterprise) title was implemented across to other disciplinary research groupings. Five research areas of specialisation and national competency were identified across the institute at this point, these were:

- designCORE - Design research in policy, society and industry
- enviroCORE – research in environmental technologies and biotechnologies
- healthCORE – research in health science and men's health
- gameCORE – research in engaging people with technology
- engCORE - research in advancing technology through engineering

2015 saw the establishment of the Design+ gateway at Carlow by the Irish government organisation Enterprise Ireland. As one of 15 gateways positioned within Irelands Institutes of Technology, it now utilises the specialised interdisciplinary expertise within CORE's at Carlow to provide innovative technology solutions to industry partners.

In an Institute now moving towards Technological University status, interdisciplinary research has become a fundamental developing culture at Carlow. Allowing young and emerging research fields from the Sciences to Humanities to draw knowledge from differing disciplines and explore how new knowledge spaces can be created, translated and transferred more effectively. In doing so looking at how non-traditional knowledge outputs can evolve and have impact.

Design to Embed Interdisciplinary Collaborative Culture and in Policy Formation

I.T. Carlow sought to revise and update institutional policy in research. This provided opportunity to identify if a Design approach could extend and embed a deeper interdisciplinary collaborative culture across the research domains of I.T. Carlow. Working through the office of Head of Postgraduate Studies, a framework of tools and events were ideated and a schedule of pan-Institutional research engagement planned. An inaugural 'Research Week' event was commenced to engage the diverse and disparate researchers and stakeholder groupings from across the Institute's research domains.

Research week included over 120 researchers across the five research centres from the disciplines of Health sciences, Computer Science, Environmental Science, Design and Humanities, and Engineering. Co-design and Design practice methods were used to create central elements of Research Week. Co-designing was used due to the inclusive nature of its process, allowing a wide range of participants to contribute to a new research culture. Co-designing has been proven to lead to more long-term successful and improved innovative

practices, more support and enthusiasm for innovation and change, and better public relations. {Steen, 2011, Benefits of co-design in service design projects}

Two different design phases were conducted:

(1) Designing a Dissemination Platform

(2) Co-designing Future Research Policy

To understand if and how a Design approach assisted to embed a deeper interdisciplinary collaborative culture in the institute, thoughts and reflections were collected from CORE directors and existing researchers after Research Week.

Designing a Dissemination Platform

Research week was created to be as inclusive activity, open to researchers at all levels. Central to the initiative was a weeklong exhibition of research work. The aim of the research exhibition was to draw the entire community of research into a broad range of cross-disciplinary conversations; opening opportunity for sharing, and to incite collaborative research action.

The objectives of this exhibition were to create a physical dissemination platform for researchers, and to design a display to ensure the complexity of discipline specific research could be understood by the widest possible audience.

Over 100 researchers were to be accommodated in the research exhibition, these included Masters, PhD, Postdoctoral, practice based researchers and academic teaching staff. To ensure the aims and objectives of the exhibition were reached; the following design stages were conducted:

(1) Creating a Unifying Brand Identity

(2) Mapping and Understanding Stakeholder Relationships

(3) Research Poster Design

(4) Exhibition Space Design

Creating a Unifying Brand Identity

The initial action toward building research collaboration for the research exhibition was the creation of a uniform brand identity for all emerging research centres at I.T. Carlow.

The aim was to create a strong common visual language which each research CORE would adopt and identify with. The objective was to support a shared sense of purpose through a common research brand infrastructure, and ultimately nudge the disparate research domains toward increased research collaboration. Elements of the existing designCORE brand identity (designed in 2008) were used as starting point for Co-designing a standardised visual language for the other research COREs. Colour and brand taglines were created to communicate research competencies (Figure 1.)

Management support was sought that this brand identity be implemented across all new emerging research centres.

Figure 1. Unified research centre brand identity (Original design and artwork created by Gwen Lettis)

Mapping and Understanding Stakeholder Relationships

The second action in creating the research exhibition was to design a means in which researchers could communicate their research broadly across disciplines. To assist identify alignment between individual research actions, and expose potential hidden opportunity between and across disciplines, a 'Research Positioning Framework' was developed (Figure.2). In designing this framework, a format that was both visual and conceptual was required. A 2X2 matrix format was chosen as it allows conceptual models to be visualised, showing relationships between data {Saffer, 2010, Designing for Interaction: Creating Innovative Applications and Devices} {Moggridge, 2006, Designing Interactions}.

Researchers from across the institute were asked to position their own research work as best they could, onto the axis, indicating a Practice to Theoretical research approach, with an Industry to Policy output and impact envisioned. This visual positioning was used to expose unforeseen areas of overlap that may otherwise not be considered, and a 'nudge' toward interdisciplinary research collaborative communication and action. Researchers were required to position their research on the framework within one of the quadrants:

Upper Left Quadrant:	Inform Strategy & Regulation
Upper Right Quadrant:	Inform Knowledge & Understanding
Lower Left Quadrant:	Impact Industry
Lower Right Quadrant:	Inform Practice & Process

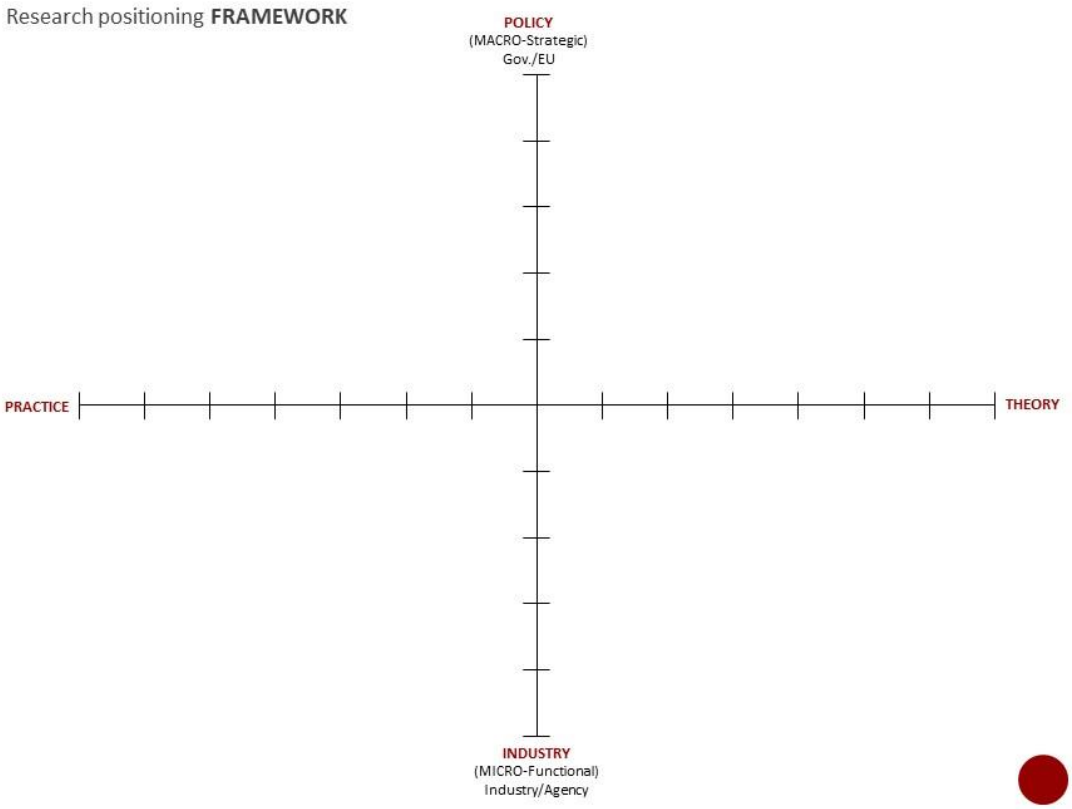

Figure 2. Research positioning framework

Research Poster Design

The third action in creating the research exhibition was to create a visual and collective means to communicate research information across disciplines. CORE directors decided that a simplified poster template in a visual, concise and accessible format should be designed. Prior to designing the poster, the following constraints were decided. That it should:

- Be ‘discipline agnostic’ and in a non-traditional academic research format.
- Communicate research in a clear and concise way to a broad audience, avoiding technical terminology and discipline related jargon.
- Be engaging, allowing for interdisciplinary engagement and enquiry.
- Be clear and concise, limited in word count, guided in use of plain English, and visual to communicate complexity.
- Include the new brand identity and Research Positioning Framework as the basis of the poster to facilitate interdisciplinary understanding and networking.

A poster wireframe was conceptualised and a standard poster template was designed (Figure. 3). The poster template was created in a Microsoft WORD document to ensure contributors could access and edit the poster format without learning a new software programme. This standard template would be provided to all researchers in the institute.

Figure 3. Front of research poster template

The following are the steps in which the each researcher had to follow to create their poster from the template:

Step 1. Input Personal Details:

- Click on 'image', delete and Insert 3x4 personal profile image.
- Click on 'contact details' and replace with your own details.

Step 2. Describe Your Research:

- Click on 'research title' and replace with your own title.
- Click 'Context' and replace text with your own.

- Create personal ‘Research Question’ and replace text with your own.

Step 3. Position Your Research on Framework:

Grab ‘colour dot’ (the brand colour of your CORE) and position your research on:

Upper Left: Inform Strategy & Regulation

Upper Right: Inform Knowledge & Understanding

Lower Left: Impact Industry

Lower Right: Inform Practice & Process

Step 4. Create a Muse Statement: Click on text and frame your own muse statement or research question.

Step 5: Image and Question: Click on the text area, following the guiding instructions and frame your own research using accessible language.

Exhibition Space Design

In total, over 120 research projects were submitted for display. Following this, an exhibition space to display the posters was required. A number of design requirements were decided in creating the exhibition space. A Co-design meeting between research directors decided that: 1. the creation of interdisciplinary connections, and 2. an inclusive space for both the viewer and the researcher were the most important requirements. With this in mind, the exhibition space was designed with the following details:

- Interdisciplinary Positioning of Posters: Researchers were positioned, not within disciplinary areas, but rather in alignment with where they had positioned themselves on the Research Positioning Framework. This aimed to challenge pre-conceived

perceptions around research alignment and expose similarities in cross-disciplinary research purpose, which here-to-fore had not been seen.

- Inclusion, Access and Comfort: To ensure access to as many people as possible, the exhibition was positioned in an informal, common access area in the institute, beside a canteen and within a natural walkthrough/ high footfall area to offices and exits. The display structure (Figure. 4 and 5) was designed to be viewed in comfort, to allow for pedestrian flow and wheelchair access. To ensure that the exhibition remained inclusive the display was circular in form to avoid perception of hierarchy. The posters were positioned without hierarchy, e.g. researchers at different career stages presented next to each other.

Figure 4. Exhibition space interior

Figure 5. Exhibition space exterior

Co-designing Future Research Policy

Research Week cumulated in a series of facilitated Co-Design workshops. The objective was to establish answers to the question: ‘how does the research community frame and articulate a robust research strategy? These workshops engaged the whole research community in interdisciplinary collaborative actions. The aim was to ensure a bottom-up view of research within the Institute by mapping the tacit insight within the existing research community to form a collective vision of research policy direction. The objectives of the workshop sessions were to allow sharing of knowledge and to qualitatively gather a quantity of inputs from across disciplines.

In framing this design-led workshop, non-biased contribution and no preconceived notions of outcome/s from participants was important. Through this collaboration, visualisation and interaction was encouraged in a non-hieratical way, the process simply

sought open, collaborative ideation. A workshop Co-Design canvas (Figure.6) was designed to assist teams work together.

In the design of this canvas, EU research challenges and national research priorities were coded and mapped against the existing I.T. Carlow research pillars prior to the workshops. The three non-discipline specific workshop pillars to be addressed were:

- Healthy and Secure Societies.
- Sustainable and Secure Environments.
- Smart and Secure Systems.

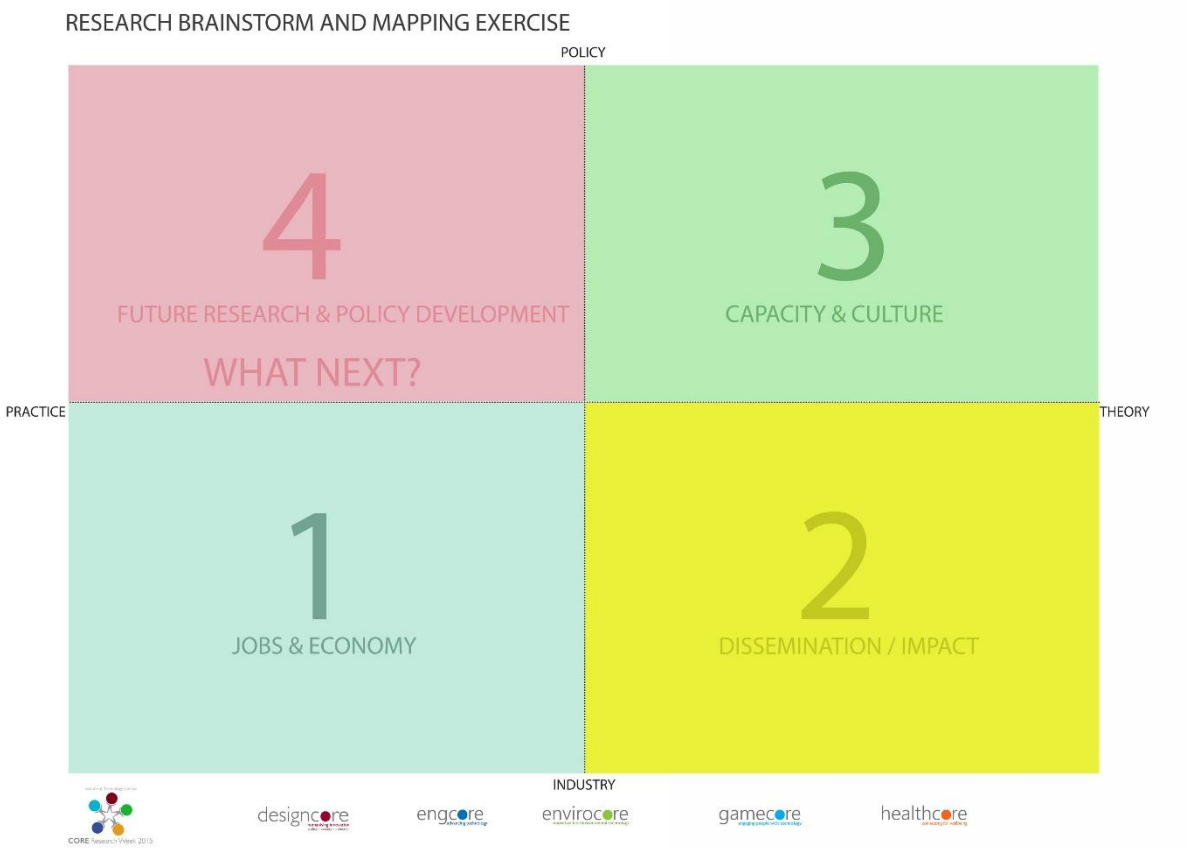

Figure 6. Workshop Co-design canvas

Workshop Procedure and Participants

Individual participants were invited to choose a workshop based on research work, or personal/strategic interest. Teams within the workshops were provided with a canvas printed in A0 size (841 × 1189 mm or 33.1 × 46.8 inches) to assist and encourage ideation in four phases:

- Phase 1: Jobs & Economy: asking how individual research contributes to collaborative action to build and sustain regional industry.
- Phase 2: Dissemination and Impact: seeking strategies on how we do it, measure it and improve it; within discipline specific and collective action/s.
- Phase 3: Capability & Culture: mapping how to extend research reach, capabilities and networks, and the internal constructs required to enhance it.
- Phase 4: Future Research Policy: suggesting direction framing strategies and supports for future policy.

The workshops were conducted in 90-minute sessions. They included three parallel groups with a facilitator and a rapporteur. Each facilitator supported and moderated the group and ensured appropriate information was being collected. The rapporteur recorded the feedback from groups on post it notes in the form of short memos no longer than 10 words. These post-it notes were then displayed on the framework in the appropriate quadrant (Figure. 7).

The facilitator led the session to assist participation with the following question: How can the research community frame and articulate a robust research strategy? This question was guided over four stages, with the following questions: As researchers, how can we: 1. Support Jobs & Economy; 2.Facilitate Dissemination & Impact; 3.Build Capacity & Culture; 4. Inform Future Research & Policy Development.

The schedule ran as follows:

5 minutes	Workshop briefing
10 minutes	Quadrant 1. Jobs and Economy
10 minutes	Quadrant 2. Dissemination & Impact
10 minutes	Quadrant 3. Capacity & Culture
10 minutes	Quadrant 4. Future Research Development
15 minutes	Group Discussion and Debrief

Figure 7. Workshop canvas in action: participants positioning post-it notes on canvas

Findings and Refection from Case Study

Reflections of the process were collected from researchers and CORE Directors post research week. Based on the original research questions, participants were asked: 1: How did/ could Design approaches assist researchers build knowledge together within interdisciplinary

contexts. 2: How did/ could Design assist to create an interdisciplinary culture within the institute? Gibbs reflective cycle {Gibbs, 1988, Learning by Doing: A guide to teaching and learning methods} was used to capture these. Descriptions and feelings from participants were evaluated and analysed into the following points.

Design methods offered inclusive understanding of other disciplines.

The research exhibition was seen as an inclusive activity that exposed undergraduate and non-academic staff to research that would otherwise not be exposed. The generic poster format with visuals, concise information, and non-discipline specific language assisted in communication cross disciplines. The exhibition also opened conversations across disciplinary boundaries toward future research opportunities. It resulted in an awareness of the breadth of research across the institute and potential interdisciplinary collaborations in the future. Further regular events such as exhibitions and Co-design workshops were welcomed.

Visual tools assisted in a deeper understanding of other disciplines

Designing visual tools was seen as a central means for researchers to understand other disciplines. The design of a uniform brand identity for all research centres at I.T. Carlow assisted in outwardly communicating a cohesive identity, while also, within the institute, creating a shared sense of research identity. The visualisation of a generic research poster design together with the Research Positioning Framework exposed connections and synergies, enhanced understanding, and enabled researchers identify potential areas for collaboration. The exhibition assisted in gaining insight regarding the macro character of research activity currently being undertaken within the various Faculties and Departments of the Institute.

New institute policy and interdisciplinary research

Design approaches assisted researchers to develop the growing institute research culture over the course of the process. The Future Research Policy Co-design workshops were positively received and resulted in the research community contributing to a 4 year Institute Policy on research. This policy has offered researchers and supervisors collective goals to move towards a means to communicate future research strategy. Several interdisciplinary research collaborations and projects were created as a result of this case study these include collaborations between Design and health services, Health and Gaming, Engineering and Design, and Environmental Sciences and Engineering. Following the success of the initiative, research week has been continued as an annual event.

Conclusions and Future Research

For young higher education institutes creating an interdisciplinary research culture can be challenging. However, the rewards for doing so can be vast, with the creation of novel research and in tackling complex 'wicked' problems. This paper discussed the process of using Design to create an interdisciplinary research culture. It supports the theory that interdisciplinary research culture can be purposefully created and designed.

This study resulted in the research community creating new interdisciplinary projects and Co-designing a 4 year institute policy on research. It demonstrated that Design methods offered a deeper and more inclusive understanding of other disciplines and increased interest and awareness in interdisciplinary research.

This case study documents the commencement of the process; research is ongoing to track development of the research culture longitudinally. Further Co-design projects and inclusive ways to communicate across disciplines will be created. Progress data will be

collected annually from Co-design exercises and by monitoring outputs such as grant applications, project proposals and publications.

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