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Impact Through Transdisciplinary Centres: Reflecting on Ocean-Related Centres at Two Universities in Northern Europe

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Abstract

A healthy ocean is crucial for a sustainable future. Universities play a key role in supporting societies to understand marine ecosystems, humanity's impact on them, and how to uncover sustainable solutions. This practice-based article examines how universities can enhance their societal impact by developing new organizational models that integrate research, education, and collaboration with societal stakeholders. It poses critical questions: What incentives drive researchers to make an impact or make their results usable? How can universities promote pathways to societal impact? And how do new organizational forms, such as transdisciplinary centres, influence traditional university structures? The article compares two transdisciplinary centres, the Centre for Sea and Society at the University of Gothenburg, Sweden, and the Center for Ocean and Society at Kiel University, Germany. Both centres aim to address urgent ocean-related challenges by fostering collaboration across disciplines and engaging external stakeholders. Gothenburg's centre works across seven faculties, promoting a broad range of activities, while Kiel's centre has a more focused agenda on marine resource management, geohazards, and food security, supported partly by government funding through the university. Key findings reveal that while these centres play a vital role in building networks and addressing global sustainability challenges, they face challenges in securing funding, integrating into traditional university structures, and measuring societal impact. Kiel's core funding allows a long-term strategy, but most work still depends on project funding whereas Gothenburg's reliance on university resources requires regular justification of its relevance. Balancing academic missions with societal impact remains a central trade-off, but these centres demonstrate how universities can advance transdisciplinary research and contribute to a sustainable future.

Keywords

future university models; marine research; ocean solutions; transdisciplinary centres; university impact

1. Introduction

In this practice-based article, we examine how researchers at the University of Gothenburg in Sweden and Kiel University in Germany are actively developing new frameworks for societal interaction and impact. One such organizational form is transdisciplinary centres, which facilitate collaborative efforts across disciplines. This article discusses the processes underlying the establishment and organization of one centre at the University of Gothenburg and another at Kiel University.

We define these centres as structures that enable diverse actors to engage in transdisciplinary research and education, fostering societal impact. Our particular interest lies in these two centres, given their focus on the ocean. The increasing international emphasis on ocean resources in relation to the Sustainable Development Goals (SDGs) heightens the need for academia to share knowledge about marine ecosystems and their relationship with human societies. At the same time, heightened economic interest in the ocean also poses risks, such as dispossession, loss of access to essential marine resources, and exclusion from governance processes (Bennett et al., 2021). These challenges present a compelling case for studying how universities can adapt to address sustainability-related issues.

Our reflections emphasize the processes whereby researchers have actively sought various pathways and models for societal interaction and impact, aiming to offer recommendations and identify potential pitfalls for future university models committed to sustainability. Sustainability's definition has evolved from a narrow environmental focus to encompass social and economic dimensions (Emas, 2015; Goodman, 1995; Porter & van der Linde, 1999). We recognize the diverse perspectives on this issue and adopt a comprehensive definition encompassing environmental, social, and economic sustainability to support sustainable operations. Furthermore, transdisciplinarity is characterized by its multiple interpretations. Here, we align with Strand et al. (2022), defining it as an approach that addresses complex challenges by engaging non-academic collaborators to create impactful solutions.

An essential consideration for the future is whether, how, and when universities seeking societal impact might face trade-offs between institutional development, integration with societal actors, and academic freedom. Van Looy et al. (2011) highlight that focusing on a single transfer mechanism may negatively affect others in the pursuit of impact.

Universities play multiple roles in developing and sharing knowledge in society, where two established routes are educating students and conducting research. Moreover, Hughes and Kitson (2012) proposed four societal interaction activities: people-based activities, community-based activities, commercialization activities, and problem-solving activities. Additionally, universities strive for a more direct societal impact. We propose at least three pathways to achieve such outcomes: (a) directly impacting society through research commercialization and spin-off ventures, (b) supporting public policy development, and (c) encouraging academic engagement through meaningful interactions with external actors. We argue that centres are a temporary organizational form that supports these three pathways while simultaneously enhancing the quality and quantity of research and education. We use these pathways to examine institutional building in the form of university centres.

Societal pressures on universities to adapt makes the topic of their societal impact particularly important. Concurrent with the expanding research on university–society interaction, expectations from international communities have intensified, urging universities to contribute to both economic growth and social development (Smith, 2007). These pressures take various forms, such as the UN SDGs and initiatives like the European Universities Initiative, which aim to enhance the capacity of European universities to achieve significant societal impact (e.g., On a European strategy for universities, 2022).

How, then, can universities of the future engage meaningfully with society and contribute to sustainability? We address this question by analyzing centres designed to balance individual initiative with structured interaction and communication. In Section 2, we first introduce the concept of university impact and its traditional interpretations. In Section 3, we discuss our methodological choices, combining case studies with reflexivity drawn from our experiences. Sections 4 and 5 describe the two transdisciplinary centres' cases. In section 6 we compare and contrast the cases with an emphasis on transdisciplinarity. In section 7, we discuss the cases in relation to our own experience and reflect on three trade-off situations universities encounter when organizing centres. Lastly in section 8, we lift the discussion to what we can learn for the future university from the cases and similar centres.

2. University Impact

Much of the policy recommendations and prior research on university–society interaction have primarily focused on the first pathway: achieving a direct societal impact through the commercialization of research and technology transfer from universities to industry. This approach, encompassing commercialization and technology transfer via patents, technical innovations, and academic entrepreneurship, is vital for economic growth and societal welfare. Various research streams highlight the significance of entrepreneurship, particularly university spin-offs, in fostering economic development (Barbero et al., 2012; O'Shea et al., 2005). Some studies even connect entrepreneurship to democracy by examining counterfactual scenarios where democracy was replaced (e.g., Germany in the 1930s and the rise of trusts in late 19th-century America), noting a sharp decline in entrepreneurship during those times (Audretsch & Moog, 2022). They argue for a deeper exploration of the relationship between entrepreneurship and democracy, suggesting that policies promoting one can also safeguard the other. Policies promoting democratic practices, such as distributed decision-making and self-sufficiency, could thus be mutually beneficial.

This first pathway of societal impact through commercialization and technology transfer has been widely adopted in the US, as well as in Sweden and Germany. Both universities and nations have developed this pathway by establishing various support structures, including incubators, accelerators, public funding bodies, and educational programs focused on innovation and entrepreneurship. Unlike universities in Germany and much of the world, Swedish universities do not retain the rights to commercially viable research results; instead, these rights belong to individual researchers (Arbetsmarknadsdepartementet, 1949). Nevertheless, the University of Gothenburg, along with most Swedish universities, has created functional organizational structures to facilitate this process within the national institutional context over the past few decades (Brunnström, 2021).

Additionally, more complex models of how universities can impact society have emerged, which introduce two additional pathways for consideration. The second pathway involves supporting public policy and

institutions by advising governments on viable strategies to achieve specific objectives. Universities can adopt more dynamic and transformative roles by fostering both internal and external competencies that support entrepreneurial initiatives through governance and public policy (Klofsten et al., 2019). The third pathway pertains to academic engagement, which, although previously overlooked, has gained prominence as a critical lens through which to understand how universities can influence society over recent years (Perkmann et al., 2013, 2021). Academic engagement is defined as knowledge-based network relationships between universities and external stakeholders. While academic engagement encompasses teaching, research, and commercialization activities, the same individuals and groups often contribute to all three domains. The literature on academic engagement emphasizes the autonomy of individual researchers; however, the impact pathways can adopt various forms and involve different external actors. Furthermore, Hughes and Kitson (2012) identify four types of societal interaction activities: people-based activities, community-based activities, commercialization activities, and problem-solving activities.

In this article we are interested in community-based activities (Hughes & Kitson, 2012) and in particular university centres. Therefore, this study investigates the preconditions, foci, and outcomes in education, research, and third mission activities, of two such centres to provide insights into how universities may organize to meet rising challenges and demands. As such, the body of research on academic engagement acknowledges that many instances depend on a combination of individual incentives and institutional support structures to facilitate and promote impactful processes (Perkmann et al., 2021). These two cases provide us with a good opportunity to analyze these underlying processes and provide insights.

3. Methodological Choices

In this article, we adopt a practice-based approach to reflect on transdisciplinary university centres. This approach is inspired by Di Nauta et al. (2018), who integrated reflexivity with case studies. Our analysis is informed by interviews conducted at the two centres, supplemented by information from the centres' respective homepages, as well as by reflecting on our own experiences with transdisciplinary centres (see Conflict of Interests, for further details). We also draw methodological inspiration from West et al. (2019), who emphasize the importance of reflexivity in connecting theoretical knowledge with practical application. They argue that by reflecting on personal experiences and acknowledging the influence of one's positionality, researchers can engage more meaningfully with stakeholders and contribute to more impactful sustainability practices.

This article aims to present and analyze two cases of transdisciplinary university centres focused on ocean-related issues. We will discuss these cases and apply reflexivity to our own experiences in establishing, developing, and working at university centres. This reflection, together with the insights gained from the cases, will allow us to conceptually propose ways in which such centres can play a more significant role in addressing sustainability challenges, particularly within the context of ocean solutions. In Table 1, we describe the interviewees and their positions within the respective centres.

As shown in Table 1, the interviews were conducted via Zoom (recorded and transcribed) or through email. The interviewees, ranging from senior scientists to directors, are deeply familiar with the centres and, in many cases, have been involved since their inception. The semi-structured interviews—whether conducted on Zoom or via email—combined both open and closed questions, allowing the respondents the flexibility to elaborate

Table 1. List of interviewees, their position, centre, date and type of interview conducted.

Interviewee	University/Centre	Date of interview	Type of interview
Person A, Gothenburg	University of Gothenburg/Centre for Sea and Society	26/6/2024	Email
Person B, Gothenburg	University of Gothenburg/Centre for Sea and Society	3/11/2024	Email
Person C, Gothenburg	University of Gothenburg/Centre for Sea and Society	6/11/2024	Email
Person D, Kiel	University of Kiel/Center for Ocean and Society	25/6/2024	Zoom
Person E, Kiel	University of Kiel/Center for Ocean and Society	25/6/2024	Zoom
Person F, Kiel	University of Kiel/Center for Ocean and Society	11/11/2024	Email

on their reasoning and provide examples. Following Yin (1994), we developed an interview guide to ensure that key topics were addressed, while also allowing the conversation to evolve in response to the interviewees' insights. The key topics of interest include:

- How the organization was created.
- What the foci of the organization are.
- What outcomes in terms of education, research, and third mission activities have they achieved.

We have compared the two centres by analyzing their respective preconditions, foci, and outcomes in education, research, and third mission activities. This comparative approach offers a comprehensive view of each centre's operations and impact. It not only deepens our understanding of their strengths and challenges but also contributes to the broader discourse on enhancing higher education systems. By drawing on these insights, stakeholders can make informed decisions that improve the overall effectiveness and societal relevance of university centres.

In Sections 4 and 5, we present the results of our analysis of the two centres—one at the University of Gothenburg in Sweden and the other at Kiel University in Germany—based on the interviews as well as supplementary documentation (e.g., annual reports and website content). In Section 6, we provide a comparative analysis of these two cases.

4. Centre for Sea and Society (University of Gothenburg)

The University of Gothenburg holds a leading position in marine transdisciplinary research and education in Sweden. Alongside cutting-edge infrastructure and expertise across a wide range of research areas, the university actively contributes to delivering knowledge, competence, and solutions that are in high demand by societal actors in both business and public organizations. In 2015, the university launched the Centre for Sea and Society (hereafter the Centre) by a decision of the vice-chancellor, with the aim of promoting collaboration between researchers interested in the ocean, society, and the relationship between the two. This account follows the first nine years of the Centre's development, during which the university made a strategic decision to invest in promoting societal impact within this field.

The Centre operates with a small secretariat comprising directors, project coordinators, and communication officers. It is governed by a cross-faculty steering group that includes representatives from all faculties and is administratively hosted by the Department of Marine Sciences. Today, more than 250 transdisciplinary ocean-related researchers from all eight of the university's faculties, spanning a total of 28 different departments, are linked to the Centre.

4.1. Preconditions

A key premise of the Centre has been the recognition that researchers with expertise in specific disciplines must work in a transdisciplinary manner. In addition, it is necessary to develop skills and competencies in transdisciplinary methods (e.g., how to connect people, groups, societies, and knowledge fields) and in sustainability science more broadly.

Prior to the Centre's launch, the university struggled to secure several large ocean-related research grants, despite having the strongest marine research in Sweden, particularly in the natural sciences, across all eight faculties. The Centre was therefore tasked with initiating, stimulating, and developing transdisciplinary research and education in the area of sea and society. It was also given the responsibility of establishing a main entry point for all marine and maritime activities at the university, thereby increasing its visibility. Additionally, the Centre was instructed to strengthen collaborations with regional partners such as Chalmers University of Technology and Region Västra Götaland and to represent the university in regional, national, and international collaboration platforms. The Centre's launch coincided with the UN Summit in New York in 2015, where Agenda 2030 was introduced, underscoring the need for diverse academic and non-academic competencies to address global challenges.

4.2. The Foci of the Centre

The Centre's primary role is to initiate and promote transdisciplinary marine research by creating activities and platforms that enable researchers from different disciplines and faculties to engage with each other and with actors outside academia. This is primarily achieved through physical and digital meetings, events, research support, and matchmaking. In summary, the Centre's mission can be described through three key objectives:

1. Supporting marine-related research across all eight faculties, including both established research groups and departments not traditionally associated with marine research, but interested in initiating projects in the area of sea and society.
2. Initiating, inspiring, and promoting interdisciplinary and transdisciplinary collaborations aimed at attracting research funding.
3. Providing a platform for collaboration and cooperation between researchers and societal actors outside academia.

Despite the Centre's well-defined role, one of its founders expressed the following concerns:

> So, the initiative was clearly from the vice-chancellor—and it is now a bit depressing to see that the following 2 vice-chancellors have not been interested in supporting this centre. I think one problem is

> that this is not a centre of the type [research centre] and so it should now fall under the centre policy of the university which is more aimed at research centres. (Person B, Gothenburg Centre)

This quote explains the difficulties in having a centre that does not do the research itself and interacts with non-university actors as well. Furthermore, it highlights the challenges faced by transdisciplinary centres, particularly when confronted with demands from university management.

4.3. The Outcomes of the Gothenburg Centre for Sea and Society

The Centre identifies its most significant achievement as creating opportunities for researchers from various disciplines and faculties to connect with each other and with external societal actors. The Centre has built a network across the University of Gothenburg, linking researchers from all faculties and departments with different competencies. This has led to an increasing number of researchers reaching out directly to each other and key actors in business and public organizations, reducing the need for introductory meetings. The director of the Centre noted:

> We are regularly involved in and coordinate University of Gothenburg's representation and participation in various third-mission activities and platforms with the aim of increasing ocean literacy. This includes forums where science is communicated to policymakers, the public, or specific societal interest groups. A particular example worth highlighting is our continuous work within different projects where work with schools to increase the ocean literacy of young people using new and often innovative methods. (Person A, Gothenburg Centre)

This quote demonstrates the Centre's efforts to promote societal impact, particularly through ocean literacy, where the public benefits from knowledge about the ocean. However, measuring the full extent of this impact remains a challenge.

Long-term collaborations with platforms such as the Swedish Institute for the Marine Environment, the Maritime Cluster of West Sweden, and the Kristineberg Centre for Marine Research and Innovation have fostered close links to maritime industries and formal management organizations, particularly in West Sweden, but also nationally and internationally. The ability to manage and administer transdisciplinary projects and events is another key outcome of the Centre's work, encouraging individual researchers to engage in transdisciplinary activities.

One of the founders of the Centre shared the following thoughts regarding its communication activities:

> Over the past years, the Centre has put a lot of effort into research communication and activities. If I should be a bit critical here, I still believe this part has not been more successful than what you can expect from communication happening within intradisciplinary departments. The communication internally [through the newsletter] is good and still fills up the demand of sharing information among disciplines; there is also a seminar activity that bridges disciplines. However, I often compare it with the Stockholm University Baltic Sea Centre which has been very successful in reaching out to society with a lot of outreach activities [such as, policy briefs, Baltic Sea breakfasts, seminars for stakeholders, webpage for the public and school, etc.] I think we should be able to match them better in this, but this has so far not happened. (Person B, Gothenburg Centre)

This quote underscores the challenges faced by the Centre in effectively communicating its research and activities, which is a key aspect of its societal impact.

Another outcome of the Centre's work has been its involvement in transdisciplinary PhD programs:

> I also consider the research school at least partly very successful. Some of the PhD students [that] came out were really trained very much broader than the usual students and were "preadapted" to become active in solving societal challenges, either in continuing doing research or being hired by authorities. Some of the students failed, but I do not think that this was due to the school or the supervisors, but perhaps that they had other problems. I still think that University of Gothenburg should have continued to fund these very broad multidisciplinary PhDs because it was rather unique both globally and internationally. (Person B, Gothenburg Centre)

Although the results from the initial transdisciplinary PhD program were mixed, the interviewee emphasized the importance of the initiative. Several of these students have continued their academic careers or taken up positions in government agencies or as consultants, publishing transdisciplinary academic papers. A new transdisciplinary PhD program launched in 2021 incorporates lessons learned from the previous program, with 3–4 students from diverse backgrounds working together on joint projects. As the following quote shows:

> Several of them have continued their academic careers or have qualified positions within government agencies or as consultants. They have published several transdisciplinary academic papers. One development of the first round was the new transdisciplinary PhD Programme that started in 2021. The experiences gained from the first attempt have led to the new education having 3–4 PhD students with different backgrounds work in a joint project. (Person C, Gothenburg Centre)

This quote illustrates the Centre's commitment to learning from its experiences and evolving its approach.

Moreover, the Centre for Sea and Society have become an increasingly important conduit for the University of Gothenburg's involvement in larger EU and international research programs. These initiatives are often not driven by individual researchers but by larger networks and consortia. Participation in research networks such as the European Marine Board, Submariner Network, EuroMarine, and Mare facilitates engagement with EU and UN bodies, and formal international organizations like ICES, provide opportunities to influence funding calls. Initiating and fostering collaborations with decision-makers in Brussels, Stockholm, and various agencies and formal organizations, as well as in the maritime business sector, is important not just for individual researchers but for the university as a whole. These opportunities could otherwise fall through the cracks, as it is difficult for individual researchers to stay updated and involved in international research organizations.

5. The Center for Ocean and Society (Kiel University)

The Center for Ocean and Society (hereafter the Center) is hosted by Kiel University, Germany, and was established in 2020. The Center is part of Kiel Marine Science (KMS) which in turn has around 70 working groups focused on maritime and blue research. The Center operates out of its facility and currently employs 30 staff members, including student assistants.

5.1. Preconditions

The idea for an ocean research centre at Kiel University began to take shape in 2017 when the university applied for funding through the German Government's Excellence Initiative, aimed at making German universities more competitive internationally and implementing the EU Lisbon Strategy. While Kiel University's proposal for this funding was not successful, the government nonetheless provided funding through other means:

> So, the proposal was submitted for the cluster of excellence and then something happened, which nobody expected. The proposal was not funded. But the money was there to establish the key ocean assessment and solution centre. (Person E, Kiel Center)

The Center officially began operations in March 2020, coinciding with the onset of the Covid-19 pandemic and the restrictions imposed by the German government.

5.2. The Foci of the Center

The Center promotes marine and blue research and belongs to KMS which works across all 70 working groups at Kiel University, which represent all faculties except theology. The Center is coordinating project development between these working groups and facilitating transdisciplinary research established at KMS. Until now, this position is project funded. This transdisciplinary and coordination focus is described by one interviewee:

> By training, I'm a chemist, but in my function here, I am the coordinator for transdisciplinary research. So that means my job is mainly building up networks and supporting networks between academic working groups here from the marine research at Kiel University and stakeholders outside the university like ministries, administration, maritime business, or non-governmental organizations. So, in a very broad sense, societal stakeholders. (Person D, Kiel Center)

The Center focuses on three main research areas:

1. Marine and coastal resource economy.
2. Marine and coastal geohazards.
3. Marine food security.

5.3. The Outcomes of the Center

An example of an output of the Center is the SeaRanger project, mutually developed by a local fishing cooperative, authorities, and researchers. The project aims to diversify the fishing profession with tasks in nature conservation, public relations, and ecosystem management. An outcome of this collaboration is a project that involves local fishermen in monitoring algae blooms while also increasing their knowledge base:

> But that's something of a new professional pillar for them to become part, to do some research on with their fishing boats. (Person D, Kiel Center)

This project exemplifies the Center's commitment to working with external stakeholders.

The Center also contributes to a master's course in transdisciplinary research, attended by around 15 students each year, drawn from diverse educational backgrounds across the university's faculties. The course aims to introduce students to transdisciplinary research and demonstrate its benefits. As part of this, they also involve non-academic actors such as non-governmental organizations from the environmental sector and people working in the Ministry for Environmental Affairs. They also promote transdisciplinary research by:

> Including non-academic actors like non-governmental organizations from the environmental sector or involving people working in the Ministry for Environmental Affairs and including them in the teaching. That's also a kind of transdisciplinary activity. (Person D, Kiel Center)

In addition to running their own transdisciplinary projects, the transdisciplinary coordinator supports other KMS members in developing and running transdisciplinary projects. The Center is also involved in numerous KMS external networks focused on transdisciplinary research and funding, such as the Global Alliance for Inter and Transdisciplinarity.

Similar to the Centre at the University of Gothenburg, Kiel's Center lacks a set of standardized indicators for monitoring its activities. As one person at the Center noted:

> While we do monitor that transdisciplinary activities are ongoing, there are no indicators or objectives in terms of numbers (yet)….How [does] a good indicator look like[?] It is always "what gets measured, gets done," and especially with transdisciplinary projects, it is so much about quality and less about quantity. (Person F, Kiel Center)

This quote reflects the challenges both centres face in measuring and monitoring the outcomes of their transdisciplinary work.

6. Analysis

The two cases have highlighted what the centres at the University of Gothenburg and Kiel University do, how they were set up and the key benefits of having centres. In Table 2, we outline similarities and differences between the two centres, derived from the interviews and complementary material.

As shown in Table 2, the core attributes of both centres are similar, particularly in their shared ambition to renew the universities and enhance their interactions with society. However, there are notable differences in the specific details of their missions and operations. The Center for Ocean and Society primarily promotes and hosts transdisciplinary research, and is only involved in education through its members. In contrast, the Centre for Sea and Society has a slightly broader mandate, supporting, enabling, and communicating marine and maritime research and education across all departments and faculties within the university.

Table 2. Comparison table: focal centre and comparison centres.

Factor	Sea and Society (Gothenburg)	Ocean and Society (Kiel)
Preconditions	Cross-faculty centre with approximately 250 affiliated researchers, funded by the university and mandated by the vice-chancellor. The centre also has external funding for specific projects	Coastal and ocean research is a designated focus area of Kiel University. The centre is a part of KMS, which involves 70 working groups engaged in maritime and blue economy research. Kiel's centre has permanent funding from the university, granted by the German state government, but also has external funding for specific projects
Foci	Supporting marine-related research across all eight faculties Initiate, inspire, and promote transdisciplinary research Providing a platform for collaboration and cooperation between researchers and actors outside academia	Coordinate transdisciplinary research about coasts and the ocean Involve external stakeholders in transdisciplinary research projects Promote research at the centre's three focus areas: marine and coastal resource economy, marine and coastal geohazards, and marine food security
Outcomes (education)	Master's program Nordic master's programme (hosted by Swemarc) Trans and interdisciplinary courses at the master's and graduate level promoted	Contributes to a Master's course on transdisciplinarity
Outcomes (research)	Linking researchers from different disciplines Enabling research collaborations across disciplines Intermediary Stimulate excellent research	Good practice guide for transdisciplinary research in marine sciences Glossary on transdisciplinary methods Support in the coordination of research applications and projects spanning all the university's faculties Linking researchers from different universities Promoting transdisciplinary research at Kiel University Stimulate excellent research
Outcomes (third mission)	Part of public-private projects Coordinating efforts Communicating research publications directly to policymakers, media, and civil society	Organizing workshops Living labs encourage dialogue between researchers and societal actors and where the public can interact with ocean-related research

The two centres are funded through the university's central budget, as well as additional project funding. Both centres face challenges in monitoring and evaluating their societal impact, particularly in defining appropriate outcomes and recurring indicators. Nonetheless, both centres produce or contribute to annual reports and undergo evaluations to ensure transparency and secure continued project funding.

Both centres focus on transdisciplinary projects and societal interaction, though they engage with these elements in different ways. The Kiel centre places significant emphasis on external stakeholders and transdisciplinary research, a focus that has influenced the broader direction of Kiel University, which now actively promotes transdisciplinary research across all faculties and priority areas. The permanent core funding for research of the Kiel centre provides it with unique conditions to engage in long-term projects, setting it apart from the Gothenburg centre, where funding is sought continually, and the management must regularly justify its relevance to university leadership. From our interviews, we have identified four main challenges the two centres face.

First, promoting cooperation across faculties and departments, while also fostering collaboration with societal actors, is a challenging and time-consuming process that requires focused communication and trust-building. While the Gothenburg centre has made significant strides in overcoming obstacles to transdisciplinary collaboration, there remains a need to identify further barriers and establish reliable pathways and routines for facilitating this approach within the university.

Second, the traditional structure of a university is not always conducive to fostering cross-faculty or cross-disciplinary collaboration, nor is it always structured to engage effectively with external societal actors. It has been necessary to develop new administrative pathways to support the university's marine and transdisciplinary profile, as well as to inform the administration about the potential for such collaborations. The creation of the new master's program in sea and society would not have been possible without innovative administrative support and collaboration from leadership across faculties, departments, and the central administration.

Third, frequent changes in university leadership, with new leaders bringing in their own ideas about how to organize academic departments and university profiles, further complicate the situation. Often, new leaders are reluctant to take responsibility for decisions made under previous administrations. Additionally, many individual researchers lack the motivation or time to engage in processes that serve the common good, as the immediate personal benefits to their academic careers are not always clear.

Fourth, in February 2023, the vice-chancellor of the University of Gothenburg decided to include marine research as one of the university's five core profiles. This decision is expected to enhance the university's visibility and strengthen its position in the non-academic world. Researchers working at the centre are building strong networks both within and outside the university, which can be personally rewarding. However, there remains some hesitation about the advantages of complementing traditional disciplinary work with transdisciplinary research, particularly when building an academic career. The outcomes of transdisciplinary work are often difficult to measure in terms of tangible metrics such as publications or funded projects, as the centre itself does not necessarily own the projects.

As a university with the vision of becoming an internationally recognized academic institution, committed to shaping the future and contributing to a sustainable world, there is a clear need to bridge the gaps between faculties, departments, and disciplines. Facilitating collaboration across these boundaries, while also engaging with external societal actors, will be crucial in achieving this vision.

7. Discussion

In the following discussion, we reflect on the two centres and our own experiences within similar centres in Sweden. Our aim is to contribute to ongoing debates regarding the governance and effectiveness of such centres, both specifically in the context of the University of Gothenburg and Kiel University and more broadly for universities investing in these centres or hubs as organizational forms to create societal impact. We view these impacts as trade-offs between various ways of influencing society and designing research.

7.1. Encountering Trade-Offs

Based on our reflections, we have identified three key trade-offs that are inherent in the operation of transdisciplinary centres. These trade-offs highlight critical issues regarding centres as an organizational form, with accompanying benefits and potential drawbacks.

7.1.1. Funding Transdisciplinary Centres

A common criticism is the opportunity cost of funding transdisciplinary centres, i.e., why allocate resources to centres rather than enhancing existing university structures? Critics might argue that investing in centres diverts funds from core university missions, such as research and student education, which could be more directly impactful in strengthening the university's primary activities.

However, we argue that one of the key advantages of centres lies in their ability to build networks—both internal (within the university) and external (with international institutions, companies, and public organizations). These networks can facilitate large-scale projects and drive impact. Centres also help develop the skills needed to coordinate complex projects and foster collaborations that might not be feasible within traditional departmental structures. While there is a risk that these investments benefit only a few individual researchers or departments, over time, the university may secure additional funding and opportunities for broader societal impact.

7.1.2. Parallel Structure vs. Line Structure

Another trade-off arises from the potential tension between the centre as a parallel structure and the university's core (line) structure. Centres may pull key people from their primary responsibilities in departments or faculties to work on transdisciplinary initiatives, potentially undermining the university's core functions.

Nevertheless, we believe that centres can complement and even enhance the work of the line organization. For example, centres can contribute to new educational programmes that bring together transdisciplinary knowledge, foster international connections, and provide a forum for idea-sharing among researchers. The demand for professionals with transdisciplinary knowledge has driven the development of such programmes. However, if centres become more attractive to researchers than their original departments, there is a risk of "brain drain," where key disciplinary expertise is drawn away, weakening the university's traditional academic structures.

7.1.3. Limits to Societal Impact

While transdisciplinary centres are granted resources and attention, their ability to address complex societal challenges remains uncertain. Sustainable development research and the UN's Agenda 2030 require collaboration across disciplines and with external societal actors.

Centres such as Sea and Society and the Center for Ocean and Society have a strategic role in facilitating collaborations between academia and industry or public organizations. The increasing desire of societal actors to engage with researchers has spurred the development of transdisciplinary academic environments. Yet, the different academic cultures, administrative rules, and research practices across various parts of the university present significant challenges. These barriers take time to overcome, and trust-building is essential for fostering effective collaborations. Centres have the potential to play a critical role in this process by acting as bridges between different university faculties and external stakeholders. However, for some urgent societal challenges, non-university research organizations—being more flexible and responsive—may be better equipped to respond swiftly to collaboration requests.

7.2. Reflections on Centres as an Organizational Form

In recent years, funding opportunities for transdisciplinary research have increased, largely in response to the growing recognition of complex societal challenges, such as those articulated in the UN SDGs and the UN Decade of Ocean Science for Sustainable Development. The EU's increasing focus on mission-oriented projects has also influenced national funding bodies. Centres can play a key role in connecting researchers to funding opportunities, facilitating collaboration, and providing support for the development of new projects. This role, while crucial, can be difficult to quantify, as it often involves activities that are not directly linked to measurable outputs like publications or funded projects.

Centres may have a formal role in contributing to strategic discussions at the university, but they could benefit from more regular consultations to leverage their expertise, contacts, and resources. Economic resources and dedicated staff have been essential for centres to respond to requests for collaboration, fund memberships in key international organizations, and host international guests. There is a clear need for university-wide functions that can act as integrators, connecting the many individual components of the institution.

Centres also serve as temporary organizations designed to leverage the strengths of the existing university structure. They bring together individuals and groups around a common theme, and their temporary nature means they have a defined beginning and end. Many of the benefits from these centres accrue to the individual researchers and students involved, and by extension, benefit the university's core research and teaching activities. The value of these centres lies in their ability to renew university activities, mobilize capabilities, and respond to emerging opportunities, although the university as a whole must empower individual researchers to take advantage of these opportunities.

8. Conclusion

Universities have numerous ways to impact society, and their potential to contribute to global challenges, particularly those related to the ocean and its ecosystems, is increasingly recognized. The demand for

academic expertise on ocean issues is growing, driven by the need to achieve the SDGs. Building on the four societal interaction activities proposed by Hughes and Kitson (2012)—people-based activities, community-based activities, commercialization activities, and problem-solving activities—we suggest a fifth category: policy and institution-building activities.

We argue that the main benefit of centres as an organizational form is their ability to sustain relationships with both internal and external actors, serve as competence hubs for international transdisciplinary projects, and inform policy by aggregating knowledge from across university disciplines. Centres such as the Center for Ocean and Society in Kiel and the Centre for Sea and Society in Gothenburg exemplify these benefits. However, we also recognize inherent challenges, which can be summarized in the three trade-off situations discussed in Section 7.1.

These trade-offs reflect some of the negative consequences of organizing research in transdisciplinary centres, including the personal uncertainties faced by researchers involved in transdisciplinary projects—uncertainties about both the outcomes of their work and the publishability of their results. For the centres themselves, there are also difficulties in measuring and communicating the societal impact of their activities.

In conclusion, universities must learn from past experiences and prior efforts to create meaningful societal impact. We believe that universities should draw on their traditional strengths (specialized research and education) while also adapting to meet contemporary challenges and societal expectations. One crucial lesson for the future university is the importance of creating an environment that fosters creativity and responsiveness. This includes streamlining decision-making processes, allocating resources to support emerging initiatives, and continuously connecting knowledgeable colleagues across disciplines. By doing so, universities can build networks and allocate resources that will enable individuals and groups to tackle the complex challenges of our time and create lasting societal impact.

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Conflict of Interests

Lena Gipperth and Linus Brunnström are members of the Centre for Sea and Society and Lena Gipperth was its director from 2015–2022, while Linus Brunnström was part-time employed as a project coordinator 2021–2022.

Data Availability

The data used in this article were collected in the form of interviews with key actors in each transdisciplinary centre and supplemented by information gathered from their respective homepages.

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