Community-based co-creation for sustainability as an academic fourth mission: An exploration of Sustainability Practices of the Smallest Institutions of Higher Learning in the Arctic

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Prior research

The following is a shortened version of a chapter recently produced for a PhD thesis. I adopted the current form to account for scope and clarity. It also builds on research previously completed on sustainability implementation in higher education within the Arctic. A 2018 study (Blaxekjær, et al. 2018) identified emerging trends in Arctic academia, including the demand for innovative skills, the establishment of a "co-creation of sustainability" mission statement, adoption of the SDGs, and increased interest in Arctic conferences and collaborations. A 2019 report (Lauritsen et al. 2019) emphasised the role of students in driving sustainable development in the Arctic. A study of the University of the Faroe Islands (Olsen, 2020) examines its historical and organisational structure and potential for improved sustainability engagement. I (Olsen, 2021) explore institutional implications of a *fourth mission statement* and helix-based engagement in Natcher & Jokela's (2021) volume on Renewable Economies in the Arctic. A systematic literature review explores global SDG implementation within academia, highlighting a need for stakeholder engagement and civic involvement (Olsen and Rosati, forthcoming). The present article aims to bridge local and global perspectives within the context of a larger body of work by examining how Arctic universities integrate sustainability into their operations at the regional level.

Introduction and Methodology

This article investigates how smaller Arctic institutions of higher learning employ sustainability in their operations. It initially used *two* surveys – one quantitative and one qualitative – to make sense of how sustainability is employed. The quantitative survey's findings were inconclusive in that they did not produce a clear enough picture of how sustainability should be understood and, therefore,

how institutions might better implement it. The qualitative follow-up of interviews (included herein), on the other hand, produced a much better insight into how these smaller Arctic institutions operate. They also reveal that the concept of *sustainability* within Arctic academia is contextual and poorly defined.

To structure the formulation and subsequent analysis, I rely on an idealised framework for academic sustainability through co-creation put forward by Trencher et al. (2014), referred to as the *4th mission*. Western academic teaching has its roots in mediaeval Europe, with universities emerging from monastic schools. Initially, universities taught only subjects related to the church. This singular focus was the first pillar or academic mission of what was to be academia as we know it today: *teaching*. As societies changed, new disciplines emerged. The Humboldtian Model emphasised academic autonomy and a holistic approach to education after the Napoleonic Wars– *knowledge for the sake of knowledge*. This addition takes on the ethos of the second pillar: *research*. Vannevar Bush's 1945 idea of linking university research with business to advance economic well-being led to the commodification of knowledge, culminating in the rise of the Entrepreneurial University in the 1980s after the Bayh-Dole Act allowed researchers to claim ownership of federally funded advancements. This development is often called "transferral of knowledge" but generally underpins the third pillar, or the third academic mission broadly known as *dissemination*. These pillars support the conventional roof of present-day academic institutional mission statements and agendas: *teach, research and disseminate*. Trencher et al. (2014) argue that these three pillars alone cannot solve the world's complex sustainability-based problems. Their proposal for a fourth mission of *co-creation for sustainability* aims to create socially embedded knowledge through stakeholder collaboration (I cover this in more detail in Olsen, 2021:130-132).

Trencher et al. (2014: 4) introduce a framework containing eight emerging paradigms on display in highly co-creative universities around the world. These paradigms centre on highly active academic involvement and collaboration on sustainability issues within their communities. To gauge how small Arctic universities display parity with Trencher et al.'s paradigms for co-creation, the qualitative interviews were structured to accommodate a comparative analysis (see *Table 1* in the Discussion).

As noted, preceding work has compelled me to question how smaller higher education institutions in the Arctic implement sustainability. To this end, I used a mixed-method data triangulation approach in the form of a questionnaire sent to a subset of UArctic members, with additional interviews with staff at selected universities. The nature of the surveys is such that the number of respondents is below the threshold for conventional statistical analysis. The resulting data has been deemed acceptable for the intended purpose, but additional research is still highly recommended.

What follows presents *only* the qualitative portion of that initial triangulation for clarity. Additionally, I lean on Flyvbjerg's (2011) encouragement that even singular case studies can assist in producing valuable knowledge. The paper is informed by neo-institutionalist theory (Meyer & Jepperson, 2021) and relies on Bourdieu's (1972) practice theory. As I am interested in the intersection of how institutions create meaning and how Arctic stakeholders reinforce or alter that meaning to further their local communities, these are well-suited for such a study.

I conclude, firstly, that there is an unfortunate duality within the discourse surrounding the concept of *sustainability* and that smaller Arctic institutions of higher learning function as local stabilisers for the economy, culture and environment – all vital aspects of sustainability. Second, I conclude that

these same institutions are in line with emerging social engagement paradigms to a surprising degree. In fact, they already follow the requirements stipulated as constituting a 4th academic mission statement (beyond teaching, researching and dissemination) as outlined by Trencher et al. (2014) in their call for new transformative universities based on "*co-creation for sustainability*".

Small Arctic institutions of higher learning: *Hybrid-institutions*

The interviews, as are presented below, were completed as an extension of a previously completed quantitative survey that relied on institutional memberships of UArctic per January 1st 2021 (UArctic, nd) as respondents. Institutions list UArctic assembly representatives and points of contact. These contacts are rectors, academic administrators, deans or Arctic researchers with sufficient insights into local sustainability developments and similarly sufficient insights into developments at a local level.

At that time, UArctic had 134 academic members. Of those, 57 were institutions with fewer than 5000 students, mostly comparable to the University of the Faroe Islands (the focus of study for my thesis). Most of these smaller institutions are relatively young, and more than half were established between the late 80s and mid-2000s. Surveying the *entire* membership base of the UArctic (Figure 1), we see that institutions were established in fairly distinct groupings. In the period before the 1810s, we see old Scandinavian and Russian national universities. In the first half of the 1800s, there was a proliferation of American and Canadian national (or large) universities. In the latter half of the 1800s and up until WW2, a number of smaller national universities (typically in second-largest cities) were established. During the war and some years following that, we mostly see an increase in highly specialised Russian technical universities. While some of the smaller institutions we will be concerning ourselves with in this article were established throughout the years presented in Figure 2, the majority came into being around the mid-60s and onward.
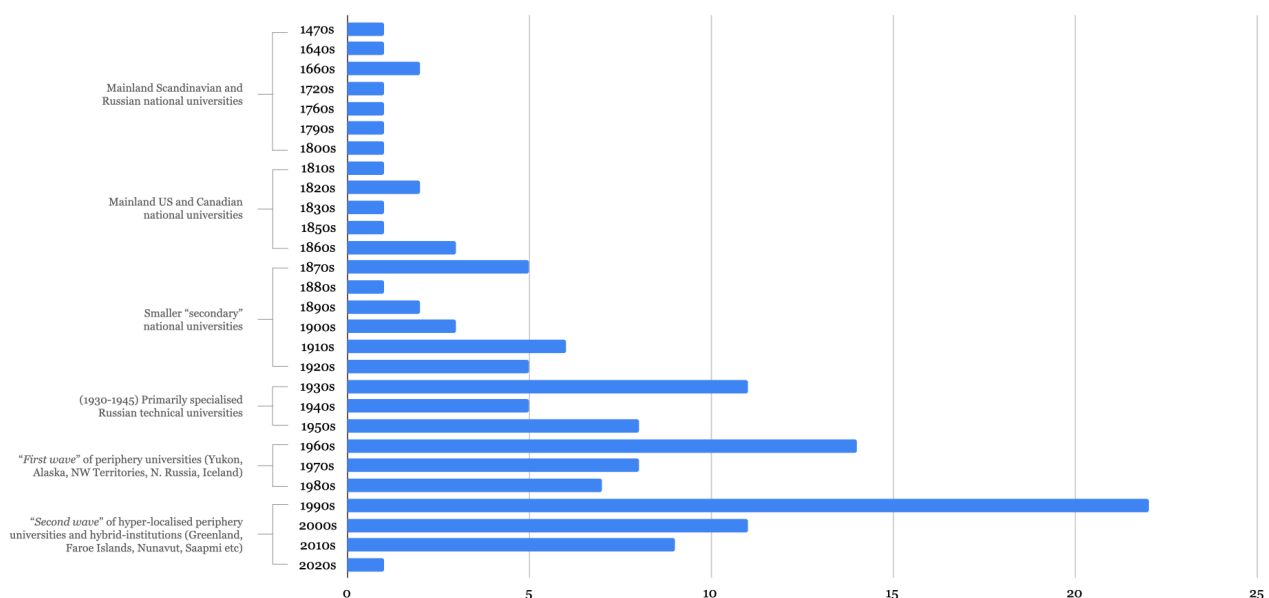

Figure 1: UArctic members' establishment sorted by decade and grouped by period.

Notably, these smaller Arctic institutions come in two distinct waves–one between 1960- and 1980, where many very local institutions on the periphery are established, especially in the far north of

Russia, Canada, and Alaska. The later wave, the 1990s-2000s, consists of even smaller and more localised institutions best described as *hybrid-institutions*: part university, part vocational college, part indigenous or cultural institution. It bears noting that these smaller institutions of higher learning make up roughly half of the membership base of the UArctic–and half of those again were established in the 1980s or later.

Qualitative survey

As noted above, the qualitative survey below is part of a larger PhD thesis. Constraints allowed for six interviews with representatives from the mentioned cohorts of smaller *hybrid-institutions*. The focus of these interviews was to explore further the concept of sustainability and how respondents, acting as institutional representatives, would contextually situate their institutions' existence and operations in that regard.

Data collection

Respondents have been made anonymous. They are located in the following regions of the Arctic: *Norway, Greenland, Sápmi, Iceland, Northern Alaska*, and *Western Canada*[1]. Interviews were conducted online, each lasting 40-60 minutes. An open-ended interview guide was produced and followed throughout. While queried institutions were very similar, there were aspects that were different enough that not all questions were equally relevant. The interview guide consisted of five different lines of questioning:

- Question on motivations and objectives behind establishing the institution in question.
- Question on challenges and barriers facing the community around the institution.
- Question on community engagement (cultural, economic, environmental).
- Question on the institutional definitions of sustainability broadly.
- Question on how sustainability might be utilised to combat challenges within the community.

Interviews were recorded and transcribed for analysis by myself.

Qualitative findings

While only six interviews were conducted, I would argue, based on previous work and interactions with a fair number of institutions on the initial list of prospective respondents, that these interviews broadly represent the state of smaller Arctic institutions of higher learning. Further, the institutions interviewed exhibit striking parity with my own historical overview and institutional analysis of the University of the Faroe Islands (Olsen, 2020).

Q1: Motivations and objectives behind establishing the institution

Historically, the interviewed institutions exhibit striking similarities regarding the reasons behind their establishment. A few came about through mergers with similar institutions, either in terms of institutional focus or due to geographic proximity. Those resulting from an institutional merger were made up of smaller, struggling local institutions. A recurring theme for all of the institutions is that they were launched through grass-roots efforts by their respective local communities. Where the majority of institutions of higher learning in the Arctic established up to around the 1950s were

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[1] Several attempts were made to reach out to Russian respondents. It seems that current geopolitical realities complicated matters.

primarily initiated through top-down governmental efforts to ensure education, the smaller institutions that came about during the two waves seen in Figure 1 came about through bottom-up efforts by communities in need of local options:

> *"It started in the mid-to-late 1980's, there was a committee that formed and [...] they were promoting this idea. There is a pretty good story behind this…they had tables at shopping malls to promote this idea of a university, and people were encourage to give [small amount] to the university fund, right…to this day I still hear from people, this is 30 years later, of how they gave their [small amount], right? It was almost as if they were buying shares in the community–so it was a grass-roots movement, and they managed to convince the government to commit resources"* (Olsen, MM. 2023a).

> *"Historically, you look at the boarding-school era where our people had to leave the community to go to education, even [name of boarding school] had 8 or 9 years old students…even younger, so, having education here at home is something very important for our people and for our communities so they don't have to leave"* (Olsen, MM. 2023b).

Due to the often immense distances within the Arctic, governmental efforts to initiate institutions of higher learning tend to be centred around highly populated areas, and regions that are geographically cut off from accessible infrastructure are often overlooked. Local solutions, then, emerge through the efforts of local elders, municipal councils, cultural enthusiasts and other firebrands.

Q2: Challenges and barriers facing the community around the institution

Aware of the multitude of stigmatic social issues facing many of the remote communities within the Arctic region, I was wary of probing too far into the territory of socioeconomic maladies. All interviewees steered clear of any such discussions on their own accord. The institutions interviewed are all located geographically in areas or regions that tend to rely heavily on resource extraction: fisheries, mining, mills, farming or husbandry. For that reason, the communities they serve can be subject to economic booms and busts. For many communities, these fluctuations can severely impact social stability, an often overlooked variable that can be quite challenging for small institutions. The most general and obvious commonality for the institutions is remoteness and infrastructural challenges due to geography. All but one are located far away from urban centres, and the areas they serve tend to be isolated further, requiring air travel or lengthy trips by ship or busses. This type of isolation tends to be a challenge in attracting students and also staff interested in remaining in the community long-term. Geographic isolation tends to translate into a scarcity of resources, and bootstrapping an institution from the bottom up can often come with very practical challenges in terms of purely daily operations. A number of the institutions interviewed are not housed in conventional purpose-built campuses but have to make do with whatever local resources allow:

> *"[O]ne main area is our physical infrastructure, we are operating out of a 1940's naval infrastructure, so we have 13 different buildings [...] and we are not connected to the main water and sewer utility from our town. It doesn't feel like a college, because it wasn't built to be a college...so our location and our facilities, we have out-grown it...it's, some of the areas are dilapidated, we can't work on it, because of the asbestos, so we are very much in need of new facilities"* (Olsen, 2023b).

Q3: Community engagement (cultural, economic, environmental)

While the initial cut-off point for inclusion in the initial survey was 5000 students or fewer, most institutions dealt with here have substantially lower numbers of students. Some as low as 150. This naturally entails limited access to facilities and restrictions on offices and teaching spaces. An interesting commonality of these institutions is their ability to increase the scope of their activities by bleeding into the surrounding community in clever ways. For some, the community is used to secure vocational internships and off-site practical training. Most seek to establish long-term partnerships with local industries. Examples such as mutually beneficial collaborations with farmers, herders and hunters to extend teaching capabilities (veterinary sciences, biology and cultural studies) are common. There was little focus on environmental sustainability during the interviews, but some interviewees offered the occasional local perspective on how it figured into academic pursuits.

> *"[B]ecause of our geographic location, the local environment around the school…it becomes a natural extension, or an obvious tool to use in our classes–drilling for ice-cores, temperature measurements and observations of local plants and animals. It's natural for our researchers, and I think…I think it is also simply expected by our students…that when we can open the door and step outside to have classes there…that, that is something that we do…I guess, somewhat naturally…"* (Olsen, 2023c).

> *"Oh yeah, we do that. We purchased snow-machines and we have had people make sleds, so that our science classes are in the field, they do snow-samples, specific science studies that are related to the specific environment here, so they can utilise the land, we grow a lot of plants–medicinal plants, they are on the field and learning our local history and knowledge"* (Olsen, 2023b).

In many instances, environmental and cultural aspects very much rub up against each other. To a large extent, this is also something that is very much ingrained in being Faroese (referring to myself); the environment *is* culture, and it can be hard to separate the two in casual conversation. The subsistence way of life that is the norm within these communities is inextricably linked with nature and the environment. Food is the obvious example:

> *[W]e had something called [cultural night], so having a cultural night…you cook soup and have traditional foods and you allow for staff who are new here to come be a part of the experience as well as our students, and they were such a hit that we had that responses from our students that they would like to have them once a month, and we can then bring in our cultural experts and utilise our space and opportunity to bring in our elders, so that they create a familiar atmosphere and be rooted in our cultural body…and I think that is something very different than a larger institution of education can offer* (Olsen, MM. 2023b).

Q4: Definitions of sustainability.

After spending roughly an hour with each interviewee, a similar pattern of attempting to draw out definitions of sustainability emerged. In most cases, after several attempts to coax interviewees to see that generally, their answers were indeed circling types of sustainability, be it environmental, cultural, or economic, direct modes of questioning were often needed. Trying to get the point across without asking leading questions required some finagling persuasion. With the interviews completed, this fact had me puzzled. It took a while to understand that this classification of *sustainable* might be an apt way of conceptualising behaviour post-factum, as I will now attempt to

do–but that, as it was relayed to me, these actions were likely understood by the interviewee as immediate and pragmatic solutions to very complex problems that would otherwise go underserved. Utilising the local environment and the stakeholders in the surrounding community wasn't meant as a deliberate *act of sustainability* but rather as a matter-of-fact *necessity*. I feel this is the same reason that the topic of the environment only came up in conversations sparingly–in many ways, the culture *is* the environment and the environment *is* the culture. The environment is always *assumed*–not part of a sustainability equation needing solving. Soil erosion, changes in migratory patterns, warming oceans, disappearing hunting grounds– these are all lived and assumed complexities of operating a small Arctic institution of higher learning on the periphery.

> *"[...] you can define sustainability however broadly you want to, right? I mean, often we focus on environmental sustainability. And I think that's been some, you know, somewhat of a focus [here] through our different programming. We have environmental studies, natural resources and environmental studies programs that focus a lot on that. But I think also, I mean, sustainability is about economic sustainability. It's about regional sustainability. It's about even the sustainability of the university itself. [We are] a standalone institution [...] and maintaining that independence is very important. In terms of sustainability, things like enrollment and [...] regional programming going back to those things, you know, we need to figure out those issues in order for us to be sustainable. These institutions are providing trained people who…who are often from the north. So they see their futures here and they want to give back to the communities where they live, whether that's indigenous communities or non-Indigenous communities. So, yeah, [...t]hat was one of the founding…, the reason why, [we] were created–to build that kind of capacity in the north"* (Olsen, 2023a).

> *"[We] would see it in a couple of different ways, sustainability I think of as self-sustainability of being a tribal college and of being who we are, we wanna maintain and continue who we are and being able to be a college that provides, we wanna sustain and we wanna be here with our culture. That can mean funding and diversifying our funding [...] I would look at that as operational–then you think of the cultural part, of language preservation, cultural learning and keeping our cultural knowledge and our subsistence way of life, hunting, the land, the language and...I see it in those two different ways...as a college financially and making sure we are in compliance with our accreditation and continue to exist as a college, but then being embedded in our culture and in being tribal"* (Olsen, 2023b).

Q5: How sustainability is used to combat challenges within the community

Taken in aggregate, these interviews revealed an insight that I think is often overlooked, perhaps even by these institutions themselves–as one interviewee noted: *"[W]hat the university does or has done is almost like act as an economic stabiliser, right? Because the university exists no matter what the resource economy is doing"* (Olsen, 2023a). In regions experiencing booms and busts in the economy, a comparatively large local institution of learning absolutely can have a noticeable balancing effect on the local economy in that it not only offers salaries to the staff that re-enter the economy–but it can also readily function as an intermediary between the community and its industry. However, this stabilising effect is not limited to economic sustainability; it extends to cultural sustainability for all the interviewed institutions in many different ways. Without explicitly stating as much, all institutions had cultural sustainability as an inherent operational aim, focusing on language preservation, history, values and norms. For a number of institutions, this was made explicit

through open-door policies that invite the community into the institution for cultural events and workshops. For some communities, these institutions provide access to facilities and larger venues able to host local gatherings and thus facilitate interactions between cultural experts, researchers and the community.

> "*Since this is a very small place, and we have modern facilities, a lot of the cultural activities and other community-based activities come through our buildings…and, and we spend a lot of effort on being welcoming and inviting to the surrounding community*" (Olsen, 2023c).

For most institutions, operational continuation and financial survival is a key concern. This often intense focus that they have, as quoted above, on *self-sustainability* and perpetuation seems to be mirrored in the student body. As one source candidly revealed, as they were about to initiate a week-long workshop with students and staff on the Sustainable Development Goals, discussions concerning sustainability can sometimes complicate matters. While the world is large and its problems legion, focusing on home can often have a surprisingly large impact.

> "*I think that our students, these young people, they really do care and they have a burning desire to make a difference. And, I think that they are going to be the ones to carry the torch, not only because they are young and idealistic, but also–don't get me wrong–it's their future…it doesn't belong to old assholes like me and you. [...B]ut I do think that there might be a challenge in working with the Sustainable Development Goals and them being this very large diffuse, global and complex thing to take on–and then translating it into something local where they as students feel can make a real difference–that bridge, I feel, is all-important*" (Olsen, 2023d).

Especially one of the conversations crystalised a mismatch between what the idea of *sustainability* is perceived as, and how it actually fails to engage. A notion that *sustainability* is a concept that is defined externally and forced onto a community is a repeated sentiment in several interviews:

> "*[We] are fed these ideas of sustainability from the media and social media…and I can get this sense of "bah!"…perhaps not fed-up with it, but at least that we as a school need to become part of making it familiar to us…to make sure that it is recognisable*" (Olsen, 2023f).

As we continue this discussion, we veer into how the Saami people are and have been at the centre of a prolonged debate on the construction of windmills in Northern Norway. While this will not be dealt with here (see Nilssen. 2019), our discussion is rather in relation to the often harsh discourse directed at the Saami and how that might impact Saami youth. We end up circling back to this idea of small Arctic schools and universities catering to indigenous or culturally distinct students functioning as stabilisers–in this case, as cultural stabilisers. Talking about what would happen if this particular school were to cease operations, we come back to the meaning of sustainability:

> "*I mean, being young [Saami] today, there has been research done on this–the harshness of the discourse against Saami. I think this school is extremely important for them to get a sense of security in order to resist such treatment. [...] If you read comments online [i.e. discussing Saami rights and politics] it is extremely offensive, it is really quite serious stuff. So, I think…that it is important that the youth here have a safe and empathetic harbour here*".
>
> MMO: "*...but, would you not call that sustainability?*"

> *"[laughs and pauses]...well, it probably is sustainability [laughs]. I never thought of it that way. But, yes, it is. It is…"* (Olsen, 2023f).

Discussion and Conclusion

This article focuses its attention on institutions of higher learning in the Arctic, particularly smaller institutions with fewer than 5000 students. It aims to take on as pragmatic an approach as possible without veering into the varied political histories within the multitude of Arctic communities– focusing on smallness. The main reason for this is the inclusion of the present research in the context of a larger research project, but certainly also that the severity and complexities of these histories would be far beyond the scope of the article. I am, by far, not the first to point out the complexities of defining the concept of sustainability. Robert O. Vos, writing in 2007 (Vos, 2007: 335), already notes that definitions of sustainability number in the hundreds. Nor am I breaking new ground in terms of pointing out complexities in defining sustainability within the context of the Arctic; Gad and Strandsbjerg, in their (2018) volume on the politics of sustainability in the Arctic, do so at length. Shorty (2022) expertly deals with this from an indigenous angle, and Huhmarniemi and Jokela (2020) do so regarding culture and arts.

These definitional complexities within Arctic academia also seem very much present. Very few of the surveyed institutions have published definitions of sustainability (nor are the majority required to do so), making it difficult to zero in on any type of consensus in terms of how sustainability is defined regionally. The interviews conducted, to some degree, mirrored this lack of definition. None of the respondents interviewed, in clear terms, offered on their own accord that their institution was *sustainable*. Institutional operations were, in the context of economics, culture and environment, overwhelmingly referred to in terms of having a *stabilising effect* but not as being *sustainable*. Only when pressed that these were often interchangeable did respondents agree that their institution was acting sustainably. Clear definitions of academic sustainability, however, did not form.

Based on the previous personal and professional experience, prior research (ex: Blaxekjær et al. 2018; Olsen, 2020; Olsen, 2021), the quantitative survey conducted before this qualitative study, and finally, the interview included herein – a picture is painted of smaller Arctic institutions of higher learning – often operating as hybrid-institutions, that are lacking in resources and removed from urban centres. They tend to service highly localised student bodies, often consisting of cultural minorities, and they generally function as facilitators or conduits for economic, cultural and ecological activities within their communities. Crucially, they also often connect conventional aspects of sustainability (environmental, social and economic) as a form of civic glue. The core reason the concept of *sustainability* is so elusive and difficult to discuss is primarily how diffuse and multi-faceted it is as a subject. The interviews presented here reveal a far more nuanced perspective on what constitutes sustainability–compared to any of the other research I have been involved in recently. Not only does it become clear that "*sustainability*" is so ingrained in the ethos of these smaller institutions that it is taken for granted and not necessarily considered *sustainability*–but, rather, a by-product of survival and continuation. Resilience, rather, would be a more fitting term to use in this context. The institutions surveyed are not sustainable because they have chosen to implement the SDGs or have produced strategic policies. They are sustainable, economically, culturally and environmentally because there is no other way for them to operate. The discourse on sustainability in academia is sidetracked or muddled by this duality of terms.

Elsewhere (Olsen, and Rosati, forthcoming), based on a systematic literature review of publications from around the world, we point to evidence that there is an emerging movement within academia to restructure academic institutional operations in such a way as to better work with issues of sustainability. We argue that the current conventional organisational and institutional structures fall short of solving complex issues related to sustainability that require collaboration and varied stakeholder involvement. While drivers behind this change are based on the interests of students, educators and external spheres of interest such as NGOs and industry, we see that barriers to change can overwhelmingly be blamed on inflexible and rigid academic modes of operations. The educators and academic staff referenced in our review all go beyond what is generally considered conventional academic mission statements–teaching, researching and dissemination. There, we find that globally speaking, the most successful efforts to introduce sustainability within academia are based on what can best be described as community-based co-creation that is highly in line with the framework being put forward by Trencher et al. (2014). To combat academic inertia within the field of sustainability, they (ibid) insist that institutions of higher learning embark on restructuring towards becoming *transformative universities*. These would be universities that systematise their approach to the three academic pillars mentioned so that it is possible to go beyond teaching, researching, and disseminating–towards an all-encompassing ethos of *co-creation*. They similarly track these emerging trends and find that universities that are especially focused on this idea exhibit eight different paradigms of social engagement (Table 1 below), all centred around active community and stakeholder collaborative efforts.

		Paradigms for successful co-creation as listed by Trencher et al. (2014)	Survey findings: Operational activities of smaller Arctic institutions of higher learning
Teaching	LIVING LABORATORIES	Engagement of university research and expertise to establish, monitor and evaluate real-life experiments and social inventions. Use of urban environment as open collaboration area	Institutions tend to have small physical spaces or lack conventional campus areas. Operations spill over into the community and the surrounding urban and geographic environment.
	TRANSDISCIPLINARITY	Joint problem-solving of real-world problems with multiple actors from society and academia. Practise-oriented approach.	Local experts and elders become part of teaching or overall coursework to address local issues, often related to cultural aspects.
	SERVICE LEARNING	Application of educational programmes to extra-curricular activities for tackling localised, real-world problems	Due to the size of communities, courses tend to focus on local issues dealing with environmental issues, food production, social issues and the like.
	COOPERATIVE EXTENSION SYSTEM	Dating back to 1914 and the land-grant system, an outreach and technology transfer portal to drive local community and rural development.	Institutions become facilitators and act as conduits for civil society and industry interaction.
Research	PARTICIPATORY AND ACTION RESEARCH	Collaborative problem defining, a fusion of researcher and subjects, empowerment of reflective social change	Researchers and educators use the community to practise their work, bringing students into the field and engaging local experts and industry.
Dissemination	REGIONAL DEVELOPMENT	Alignment of university functions with regional economic development goals. University plays active role in regional governance.	Institutions are a main actor that engages with local development practically. Research projects and courses are geared towards local development.
	URBAN REFORM	Targeted economic revitalisation by directing university financial resources to the local community and real-estate development.	Low on monetary resources, institutions tend to opt for facilitation and playing an active role in the development of the local community.
	TECHNOLOGY TRANSFER	Commercialisation of research results, societal contribution through economic development	Transferral of research and educational results are mainly cultural or vocational.

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4th mission	CO-CREATION FOR SUSTAINABILITY	Internal and external collaborative co-creation on local issues concerned with cultural, economic and environmental sustainability.	Due to their size, lack of resources or geographic placement, institutions are forced to engage with aspects of sustainability through co-creation.

Table 1: Adapted and expanded upon Figure 1 "Research & Social Engagement Paradigms in Trencher et al. (2014:4). They list the following eight constituent parts as, when combined, making up the 4th mission statement.

These eight paradigms listed by Trencher et al. (2014) all centre around activities that engage the local communities served by universities and institutions of higher learning. They focus on real-life solutions that can alleviate and solve societal problems. They are activist and transformative and acknowledge that co-creation is the best way for actors to engage with complex issues. For the institutions that Trencher et al. point to in their work, these paradigms are novel, and none encompass all eight principles. The Arctic institutions featured herein reveal themselves to come exceptionally close to embracing the full gamut of the listed paradigms–not as an active pursuit of sustainability in terms of the SDGs, but rather as a pragmatic solution to survival. Just as the economy, the environment and culture often fuse and can be hard to separate for most respondent institutions–so we see a similar melding between education, research and dissemination. Whereas the economic, cultural and environmental aspects of sustainability are taken to mean *stability,* the overlaps between institutional operations regarding education, research and dissemination produce a similar result through community-based *co-creation.* Interestingly, for these very small institutions, the sustainability components (economy, culture, environment) also fuse with institutional missions (teaching, researching, dissemination) due to a need for stability and how it is engaged through co-creation.

References

Blaxekjær, L., Olsen, MM. et al. (2018) *The Sustainable Development Goals and Student Entrepreneurship in the Arctic.* Arctic Yearbook 2018, Akureyri: Northern Research Forum and UArctic Thematic Network on Geopolitics and Security.

Bourdieu, Pierre ([1972] 1977) *Outline of a Theory of Practice.* Cambridge University Press.

Flyvbjerg (2011) *Case Study.* Chapter 17:301-316 in Norman K. Denzin and Yvonna S. Lincoln (eds), *The Sage Handbook of Qualitative Research*, 4th Edition. Thousand Oaks, CA: Sage, 2011.

Gad and Strandsbjerg (2018) *The Politics of Sustainability in the Arctic: Reconfiguring Identity, Space, and Time.* Routledge.

Huhmarniemi and Jokela (2020) *Arctic Arts with Pride: Discourses on Arctic Arts, Culture and Sustainability. Sustainability* 2020, *12*(2), 604.

Lauritsen, S. E., Olsen, MM. et al. (2019) *Educating Arctic Entrepreneurs: The next generation of sustainable pioneers.* Nordregio report on entrepreneurship in the Arctic. Published by the Nordic Council of Ministers.

Meyer, J. and Jepperson, RL. (2021) *Introduction: Cultural Institutionalism* (pp. 3–24), in *Institutional Theory: The Cultural Construction of Organizations, States, and Identities,* Meyer, J. and Jepperson, RL. (eds.), Cambridge: Cambridge University Press.

Nilssen, TR. (2019) *South Saami Cultural Landscape Under Pressure*. Ch. 9 in Hermanstrand, H. et al (2019) *The Indigenous Identity of the South Saami: Historical and Political Perspectives on a Minority within a Minority*. Springer Open; Springer International Publishing.

Olsen, MM. (2020) *University of the Faroe Islands: From Nation-building to Nation-branding*. Økonomi & Samfund 93(4); Special issue on the Faroe Islands, Blaxekjær, LØ (ed). Djøf Forlag: Copenhagen [published in Danish].

Olsen, MM. (2021) *An Academic Lead in Developing Sustainable Arctic Communities: Co-Creation, Quintuple Helix, and Open Social Innovation*. Chapter 7 in: Natcher, D. and Jokela, T.: *Renewable Economies in the Arctic*. Routledge.

Olsen, MM., Rosati, F., Li-Ying, J. (forthcoming) *Universities as Agents for Entrepreneurship and Innovation for the Sustainable Development Goals: A Systematic Literature Review* [Manuscript submitted for publication].

Olsen, MM. (2023a) *Interview with a First Nations institution in Western Canada*. Interview conducted March 30th, 2023. Interview conducted in English.

Olsen, MM. (2023b) *Interview with an Iñupiat institution in Northern Alaska*. Interview conducted October 10th, 2022. Interview conducted in English.

Olsen, MM. (2023c) *Interview with an institution in Northern Norway*. Interview conducted November 8th, 2022. Interview conducted in Danish and Norwegian, quotes translated.

Olsen, MM. (2023d) *Interview with an Inuit institution in Greenland*. Interview conducted March 20th, 2023. Interview conducted in Danish, quotes translated.

Olsen, MM. (2023e) *Interview with a rural institution in Iceland*. Interview conducted March 21th, 2023. Interview conducted in English.

Olsen, MM. (2023f) *Interview with a Saami institution in Norway/Sápmi*. Interview conducted April 21th, 2023. Interview conducted in Danish and Norwegian, quotes translated.

Shorty, N. (2021) *Sustaining Indigenous Knowledge as Renewable "Resources"*. Chapter 8 in: Natcher, D. and Jokela, T.: *Renewable Economies in the Arctic*. Routledge.

Trencher, G. et al. (2014), *Beyond the third mission: Exploring the emerging university function of co-creation for sustainability*. Science and Public Policy, 41(2): 151–179.

UArctic (nd) *Members*. University of the Arctic website: www.uarctic.org/member-profiles.

Vos, RO. (2007) *Perspective. Defining Sustainability: A Conceptual Orientation*. Journal of Chemical Technology and Biotechnology, 82:334-339.