What's required for universities to address complex societal challenges?

May 11, 2021

By David D. Hart and Linda Silka

1. David D. Hart (biography)
2. Linda Silka (biography)

How can universities use their broad array of expertise to help in understanding and addressing complex challenges, including pandemics, environmental degradation, poverty and climate change?

For more than a decade, we have been engaged in an innovative collaboration with more than 200 faculty from nearly 30 academic disciplines to align university research with societal needs. We conceived of this initiative as an "institutional experiment," in which our public university in the US state of Maine served as the "laboratory."

Given Maine's priorities and our collective expertise, we focused these problem-solving efforts on the challenge of sustainable development, which requires a dual focus on improving human well-being and protecting the environment. We created a diverse portfolio of projects on, for example, fisheries, forests, food insecurity, renewable energy, and climate adaptation.

Along the way, we have been conducting formal and informal studies to identify the factors facilitating and hindering our progress. Here's a sketch of what we learned:

Tap into deep aspirations

Although individuals pursue academic careers for many different reasons, our colleagues' motivations often include an aspiration to "make a difference," contribute to something "larger than themselves," and "link knowledge with action to create a brighter future." This individual and collective passion has served as an indispensable, renewable resource for navigating uncharted waters and improvising our way to solutions.

Connect with communities

Given the goal of "linking knowledge with action," we have focused on the kinds of actions our work could potentially inform and the societal actors it could serve. Accordingly, we have built collaborations with hundreds of stakeholder organizations spanning all levels of government, Indigenous communities, the private sector, non-governmental organizations (NGOs) and civil society. We strive to "meet these partners where they are" – that is, to engage in mutually beneficial collaborations that are respectful of, and responsive to, their concerns.

Nurture interdisciplinary collaboration

As we engaged with stakeholders, it became obvious that efforts to develop solutions to their sustainability-related problems would benefit from many different kinds of expertise. Regardless of whether these conversations began with a focus on economic development, community resilience, technological innovation or environmental stewardship, there were many connections among these issues. Rather than take a piecemeal approach to these complex challenges, we have assembled interdisciplinary teams that excel at systems-thinking. Despite the greater time and effort it requires, our researchers favor this approach because it is more likely to produce durable solutions.

Create a shared culture

As we became aware of the deep aspirations motivating many faculty, we recognized parallels with the way that mission-driven NGOs often develop a shared culture that aligns with their passion to create a better world. Such

organizational cultures commonly have a foundation of core beliefs and values that helps promote collaboration and coordination. Although universities are very different than NGOs, our work has also benefited from the early development of a core values statement (Hart, 2018).

Learn by doing

There were components of these unconventional collaborations that felt uncertain and risky to researchers. To make it easier for everyone to gain experience and become more comfortable, we have framed our work as a series of pilot studies, because these are inherently about learning-by-doing. We have been inspired by the civil engineer Henry Petroski, who, when writing about the role of failure in the design of bridges and other infrastructure, said that "no one wants to learn from mistakes, but we cannot learn enough from successes to go beyond the state of the art."

Be prepared for conflict

Conflict often arises in teams of researchers with different expertise, disciplinary cultures and reward systems. Knowing this, teams should establish shared commitments and practices to address conflict proactively. Because communication—and miscommunication—plays such a central role in conflicts, our teams often include communication faculty or faculty with related expertise in diagnosing and resolving conflicts. Rather than believing that conflict should be suppressed, we view it as a valuable resource when harnessed effectively. The very differences—in expertise, values, and preferences—that generate conflict can serve as raw material in crafting new ways of understanding and solving societal problems.

Turn the microscope on yourself

Given our spirit of learning-by-doing, we also made an early commitment to investigate the effectiveness and context-dependence of different strategies for aligning research with societal needs. We found researchers with expertise in such diverse fields as management, psychology, and communication who we eager to use our projects as their own laboratory for strengthening the theory

and practice of organizational effectiveness. This kind of research has helped increase our teams' capacity for collaboration, which in turn enhances the real-world impact of our work.

Persevere

We've encountered myriad obstacles in growing our collective capacity for stakeholder-engaged, solutions-driven, interdisciplinary research, and there have been many points along this journey where the future of our work was in doubt. We can't begin to understand the diverse factors that have shaped our colleagues' extraordinary commitment to forge ahead despite long-odds, setbacks, and alternative professional paths that were more comfortable. But we can say this: without perseverance – that ineffable unwillingness to give up – none of this would have ever happened.

Conclusion

Although we began this work at a single university, we've now helped grow a research network that has spanned 18 universities in New England.

Given that similar efforts are underway at universities in many different parts of the world, how can we develop a more systematic approach to learning from these diverse initiatives, and how can we accelerate their progress? If you are involved in such an initiative, does our experience resonate with yours? Do you have other lessons to add?

To find out more:
Hart, D.D., and Silka, L. (2020). Rebuilding the Ivory Tower: A Bottom-Up Experiment in Aligning Research with Societal Needs. *Issues in Science and Technology*, **36**, 3: 64–70. (Online – open access): https://issues.org/aligning-research-with-societal-needs/

Reference:
Hart, D.D. (2018). Teamwork Is the New Leadership. *Maine Policy Review*, **27**, 1: 30 -33. (Online – open access): https://digitalcommons.library.umaine.edu/mpr/vol27/iss1/10

Biography: *David Hart PhD is director of the Senator George J. Mitchell Center for Sustainability Solutions and professor in the School of Biology and Ecology at the University of Maine in Orono, USA. Together with hundreds of colleagues in and beyond Maine, he is focused on helping universities become more useful societal partners in solving complex problems.*

Biography: *Linda Silka PhD is Senior Fellow at the Senator George J. Mitchell Center for Sustainability Solutions and Professor Emerita in the School of Economics at the University of Maine in Orono, USA. Her career has been devoted to building community-university research partnerships that work across disciplines and with diverse partners and stakeholders.*

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Cases, Institutionalisation, Processes, Research implementation

Culture, Interdisciplinarity (general relevance), Perseverance, Productive disagreement

David Hart, Linda Silka

7 thoughts on "What's required for universities to address complex societal challenges?"

Paul Bolger

May 24, 2021 at 3:07 am

Hi David and Linda, thanks so much for this wonderful article. As a manager of a cross-university environmental research institute in Ireland, so much of what you said resonated with me. Congratulations on the success you have had at the Senator George J. Mitchell Center for Sustainability Solutions in leveraging the expertise of the university to address urgent sustainability challenges; I have sure that much of this is down to the vision (and perseverance) of leadership. I was wondering what is the role of scientists within your Center who are more focused on theoretical/fundamental research rather than solutions-oriented and stakeholder-focused work? Perhaps they might feel that this more traditional type of research work is undervalued with the Center?

Reply

David Hart

May 26, 2021 at 10:12 pm

Hi Paul,

Thanks for your important question about the role of theoretically-oriented scientists in the Mitchell Center for Sustainability Solutions. Many of the scientists who are members of the Center have interests in both basic and applied research. Indeed, they often employ creative strategies for leveraging the respective strengths of both approaches in their work. Some scientists have been doing innovative theoretical work in the past, and now seek to increase their research's usability (sensu Clark et al. 2016). Fortunately, the Mitchell Center is just one part of our public university, so there are also many other professional paths available to researchers who want to focus exclusively on advancing theory.

All the best,

David and Linda

Clark, W. C., Van Kerkhoff, L., Lebel, L., & Gallopin, G. C. (2016). Crafting usable knowledge for sustainable development. Proceedings of the National Academy of Sciences, 113(17), 4570-4578.

Reply

Paul Bolger

May 27, 2021 at 6:16 pm

Hi David and Linda, thanks for the reply and this additional information. I agree that there can often be a happy marriage between the focus on fundamental research and user inspired research – Clark refers this as the "Pasteur's quadrant". I sometimes worry however that a very strong focus on co-production and usable knowledge in our Institute leaves some of our scientists scratching their heads in terms of where they fit in! Keep us the great work. Paul

Reply

Jennifer Nelson Gray

May 12, 2021 at 8:38 am

Thank you very much for this terrific article. I work with a large public university interdisciplinary 'research grand challenges' program, and so many of these insights resonate with our experience implementing these programs. One thing I missed in your analysis was mention of support staff such as program directors, project managers, communications

managers, financial administrators: did you have any, and (how) were they helpful/integral to the effort? I'd also love to hear more about how you tracked performance at the center: how did you identify metrics to track, and why did you choose the ones you did? Thank you!

Reply

David Hart

May 13, 2021 at 10:00 am

Hi Jennifer,

We're very glad you found our article helpful.

Thanks for asking about the roles that support staff play in our work. In short, we've been incredibly fortunate to work with outstanding staff members for more than a decade. They are indispensable to our work, and the roles they play (e.g. project coordination, financial management, communications) are just as important as the roles of faculty and students.

For us, tracking performance has involved at least as much art as science! Some of our funders have encouraged us to focus on more conventional metrics, including the number of publications and external grants. Given that our ultimate objective is to develop useful solutions, we also try to identify potentially relevant milestones on the road toward that sometimes elusive goal. These include the ability of teams to adapt to changing circumstances, the growth of shared leadership capacities, and the interest expressed by new faculty and students in participating in these projects.

All the best,

David and Linda

Reply

Jennifer Nelson Gray

May 14, 2021 at 4:33 am

Super, thank you – this is great and helpful for something I'm working on right now!

Reply

Vladimir Mokiy

May 11, 2021 at 6:36 pm

Dear colleagues, understanding and finding solutions to the complex problems of modern society is a vital task! In this situation, any theoretical and practical experience is important. Therefore, I wish you further success!

However, I would like to draw your attention to several circumstances that may be relevant to this task.

Some scientists who work in this field believe that the humanities and social sciences are inferior to the natural sciences in the rigor of scientific concept and scientific method. In this case, the search for solutions to the problems of modern society is based on a subjective interpretation of the necessity and purpose of humans, as well as the goals and objectives of nature. The structure and sequence of the general development, in which

people, states and natural biogeocenoses are involved, is interpreted subjectively. Is it possible to make a risk analysis of the proposed solution to the complex problems of modern society outside the context of an objective worldview position? History shows that the subjective interpretation of the worldview foundations has led society to catastrophes many times. Therefore, you will agree that it is not so much important for society to solve its problems. More important is a comprehensive scientific justification for solving these problems.

Maybe it's time to improve the approach to solving the complex problems of modern society, strengthening the established teams of scientists with a strict conceptual and methodological justification of the humanities and social sciences? I am sure that the necessary resources are available for this today and can be used in the process of fruitful cooperation.

To find out more:
– Mokiy, V., & Lukyanova, T. (2021). Transdisciplinarity: Marginal Direction or Global Approach of Contemporary Science? Informing Science: The International Journal of an Emerging Transdiscipline, Vol.24, pp. 001-018. DOI: https://doi.org/10.28945/4752
– Mokiy, V. S. (2021). Information on the Information. Systems transdisciplinary aspect. Universum: Social sciences. 1-2(71). https://doi.org/10.32743/UniSoc.2021.71.1-2.40-48
– Mokiy, V. S. (2021). Information on the Time. Systems transdisciplinary aspect. Universum: Social sciences. 1-2(71). https://doi.org/10.32743/UniSoc.2021.71.1-2.30-39
– Mokiy, V.S. (2020). Information on the Space. Systems Transdisciplinary Aspect. European Scientific Journal, ESJ, 16(29), 26. https://doi.org/10.19044/esj.2020.v16n29p26
– Mokiy, V. S. (2019). International standard of transdisciplinary education and transdisciplinary competence. Informing Science: the International Journal of an Emerging Transdiscipline, 22, 73-90. https://doi.org/10.28945/4480

Vladimir Mokiy

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