

Future Directions for Global Higher Education: Transdisciplinarity and Public Engagement

Louis E. Swanson | A. Scott Reed | Hannah B. Love | William F. Shuster

Abstract

Global higher education (HE) is confronting complex challenges and opportunities arising from international crises that threaten communities and natural ecosystems. The capacity of HE institutions to respond effectively depends on how they integrate education, research, and community engagement. Yet, two persistent shortcomings hinder progress: limited advancement of transdisciplinary education and research, and insufficient public engagement among students and faculty. Addressing global issues requires combining these dimensions to build a more resilient and socially responsive academic framework. Despite structural and cultural barriers—particularly within academic departments and degree structures—there is growing optimism about higher education’s potential to foster transdisciplinary collaboration and public engagement. Future directions include developing flexible, community-oriented educational models that equip learners and researchers to address global and local challenges collaboratively, while promoting inclusion by engaging even the most underserved populations.

International boundary-spanning crises—such as climate change, endemic poverty, social justice issues, and pandemics—represent some of the most pressing challenges facing society today. Effectively addressing these global challenges requires the active participation of higher education (HE) institutions worldwide. While it is essential for HE to incorporate transdisciplinarity¹ into coursework and research, simply internalizing this approach is not sufficient. Transdisciplinary inquiry and methods alone do not guarantee that HE is meaningfully collaborating with society and markets to develop solutions to these complex issues (e.g., Brundiers, K., et al., 2013; Walsh, M., 2014; Trencher, G., et al., 2014). There must be a deliberate effort to sustainably bridge academic work with real-world problems.

Transdisciplinarity and HE public engagement are closely linked concepts. When combined, they are more likely to generate significant societal impacts by fostering more holistic conceptual frameworks leading to innovative solutions. Both topics—transdisciplinarity and public engagement—are already well-established in academic discourse, yet neither currently stands as a primary mission for global HE institutions. The central question is how these two approaches, working together, can make global HE more impactful for society and more valuable for students and faculty. By aligning transdisciplinary practices with public engagement, higher education can play a pivotal role in addressing boundary-spanning crises, ensuring its relevance and effectiveness in tackling global challenges.

¹The companion academic terms ‘transdisciplinary’ and ‘transdisciplinarity’ simply refer to broad collaboration among academic disciplines (see for example Swanson, L. and S. Reed, 2023). Swanson and Reed write that inter/multi-disciplinary would include collaboration between a forester and a sociologist. Whereas collaboration among foresters, sociologists, economists, soil scientists, atmospheric scientists, and communications studies folks is transdisciplinary focused on society and the environment.

Our hope and concerns reside with HE's ability to be useful for society. Existing public skepticism and misinformation about HE continue to erode public and government confidence in its potential and role as partners in solving problems posed by truly wicked issues (e.g., Brundiars, K., et. al., 2013; Trencher, G., et. al., 2014; Zierhofer, W. and P. Burger, 2007; Nash, J., 2008; de Rezende Alvares and P. Sá Freire, 2022; Reed and Swanson, 2022; Gavazzi, S., 2025). Harvesting society's expanding demands for transdisciplinary expertise creates paths toward HE's fiscal resiliency and public relations legitimacy.

Global Higher Education: Similarities and Diversity

Higher education (HE) systems around the world exhibit both meaningful differences and notable similarities. While there are shared features across national boundaries, it is essential to recognize and emphasize the rich diversity present among higher education institutions globally. This diversity is not incidental; it reflects the unique historical, cultural, and environmental contexts of 21st century societies, both at national and local levels. Each higher education institution is shaped by its specific local circumstances, molded by distinctive combinations of social forces and ecological conditions.

Similarities are equally visible. In contemporary society, higher education institutions are regarded as cultural imperatives. They exist in every nation and are characterized by shared goals and organizational structures. These institutions play a vital role in the creation, reproduction, and dissemination of knowledge, as well as in the development of critical analytical skills. Natural and physical science disciplines have long histories combining scientific disciplines. But boundary spanning global challenges also include social organizational and cultural forces. These topical areas are the academic domain of the humanities and social sciences. They contribute significantly to understanding diversity and identifying commonalities among social institutions.

Global higher education (HE) institutions, despite their diversity, share several core societal functions and face common challenges. These institutions are dynamic entities, constantly responding to and accommodating shifting social and ecological forces that influence their communities, regions, and nations. The focus on 'global' HE arises from their increasingly essential role across all levels of society. HE institutions not only disseminate knowledge and develop critical thinking skills, but they also apply both existing and emerging knowledge to immediate individual, market, and policy decision-making. The cumulative impact of these decisions shapes social wellbeing and influences a broad array of collective challenges, either enhancing or diminishing social and ecological wellbeing.

Like other cultural institutions, HE institutions are not static; they do not remain fixed by institutional organizational status quos. Instead, they react to the evolving needs of their natural and social environments, adapting their functions to better serve society. They continuously adapt to changing natural ecological and social organizational realities.

There are opportunities for HE institutions to realign portions of their academic and fiscal resource portfolios toward transdisciplinary collaboration and teaching. This shift involves directly engaging teaching and research with all levels of society. Achieving this may or likely will require internal organizational adaptations that facilitate teamwork and career development for faculty, as well as additional degree opportunities for students.

Several pathways exist for HE institutions to direct some of their talent toward transdisciplinary curricula, applied research, teamwork training, and off-campus societal engagement. These efforts can help establish sustainable, broad-based collaborative public engagement. The options presented here are not exhaustive, but they highlight key opportunities for HE institutions to shape different futures by embracing transdisciplinary studies and engagement.

Societal Engagement and Transdisciplinarity

The term ‘transdisciplinary’ is encountered more frequently within the context of higher education (HE) than in communities, government agencies, or business organizations. This trend highlights the distinct organizational structures and cultures that characterize academic disciplines and departments in HE institutions. The widespread adoption of this term in academic settings demonstrates how these environments influence both the language and the methodologies embraced by their members (see Trencher, G., et al., 2014).

Campus leaders may need to clarify both transdisciplinary and engagement internal and external audiences. Concepts such as ‘transdisciplinary education’, ‘community engagement-outreach’, and ‘critical thinking’ can sometimes seem complex, confusing, or even intimidating to campus and community members. However, these terms can be made more accessible and less daunting through effective communication and strategic initiatives. A common approach borrowed from business to drive intentional qualitative change, especially when terms are not yet widely understood, involves organizing campus-wide charrette teams (Michigan State University, 2024). This strategy focuses on identifying areas of ambiguity or tension within the institution, then working collaboratively to develop clear, institutionally relevant terminology and action plans that address the interests of diverse campus stakeholders.

Societal engagement can be perceived as too inclusive, too ambiguous, too broad or too ambitious. A term like ‘outreach’ may conjure images of ‘top-down’ project management which inhibits bottom-up ideas and innovations from students and faculty. ‘Critical thinking’ can imply degrees of unreflective negativity. Most of these terms are well articulated and available for adoption. ‘Engagement’ refers to institutionally defined public collaboration – the co-creation of university programs with their constituent populations (Fitzgerald, et. al., 2015). ‘Outreach’ tends to be unidirectional from a professional to a learner. ‘Engagement’ implies that mutual learning and listening occurs in all possible directions. Developing ‘critical thinking’ is a core for humanities and social sciences curricula, uncovering assumptions and accessing different perspectives. Both ‘outreach’ and ‘engagement’ are necessary terms for successful collaboration with regional and local societies as well as on campus discussions.

Social Structure, Culture, and Human Agency

We employ a sociological and business framework for illustrating institutional *social structures*, *cultures*, and *human agency*. All three of these theoretical building blocks are useful for identifying organizational structural and cultural pinch points, including resilient status quo antibodies resisting moves toward transdisciplinary education and public engagement. None of these are so entrenched as to deter new pathways for their societal missions. These are straightforward conceptual frameworks which can be used by senior policy makers and local practitioners alike.

At their core, HE organizational structures are their bureaucratic rules, academic departments, colleges and administrative units. The controlling ‘social glue’ that reproduces, interprets, and enforces normative expectations for individual and collective behavior is their *culture*. Group and individual volition/behavior – *social agency* – interpret and shape activities for all social organizations. How employees’ understanding of their organization’s administrative and cultural dynamics will influence an institution’s resiliency or failure.

Each of the conceptual building blocks – *structure*, *culture*, and *social agency* – are interdependent conceptual tools. Their conceptual utility resides in interpreting organizational behavior. These conceptual building blocks provide tools for making sense of daily and long-term organizational behavior and outcomes. They are best employed tools together in making sense of conceivable social change for possible futures. For example, as discussed below, academic departments and colleges are governed by their organizational rules (social structures), cultures, and the individual agency of their people.

This simple conceptual framework will be used for the remainder of this manuscript to examine eight structural pathways for HE. Each path can be considered independently, but it is most likely that multiple paths can be integrated and advanced simultaneously.

Eight Pathways Forward

Below we propose eight immediately available pathways for institutional adaptation of transdisciplinary studies and research combined with HE societal engagement. We briefly list eight here as a preview of later suggestions for connecting transdisciplinarity with societal engagement:

- 1) greater curricula/degree options for students,
- 2) development of skills for participating in transdisciplinary teams,
- 3) establish career paths within and among academic departments,
- 4) expand curricula to include transdisciplinary studies and engagement,
- 5) facilitate and reward transdisciplinary research,
- 6) engagement with local communities, businesses, government agencies,
- 7) collaboration with local and global partners, and
- 8) integrate talent of government ministries and NGOs in support of student learning and professional development – preparing students for careers (eg. Internships, post-graduate fellowships, etc.).

These proposed paths overlap with one another. For example, developing opportunities for students to choose among transdisciplinary courses or degrees coupled with communities, families, and development agencies. We view these pathways as a few among many possible futures for connecting higher education with transdisciplinary studies coupled with public engagement.²

Institutional Resistance and Opportunities for Blending Transdisciplinarity and Societal Engagement

Presently, global HE institutions, including North America and Europe, provide limited opportunities for either *transdisciplinary studies* or *societal engagement*.

Mobilizing HE's remarkable institutional capacities for joining on-going efforts dealing with threats to national well-being will open new paths toward yet unrealized alternative futures. Again, HE institutions are national *cultural imperatives* responsible for advanced technical training and developing critical thinking skills for current and future citizens. They are multi-task institutions that create, teach, and diffuse knowledge. As such, they are frontline national resources available for dealing with social and economic threats and opportunities – they host and train professional problem-solvers and leaders.

Integrating transdisciplinarity and societal engagement into higher education (HE) represents a significant shift from traditional academic practices. This approach moves beyond the boundaries of individual disciplines and prioritizes collaboration across various fields and with society at large. Academic departments, or disciplines, serve as foundational structural divisions within higher education (HE) organizations. Their primary role involves overseeing and approving the professional development of both students and faculty. These departments often maintain a degree of insularity, closely guarding their governance responsibilities and shaping the academic and professional trajectories within their specific fields. Because academic disciplines tend to be insular, departments can become pinch points when it comes to incorporating transdisciplinary approaches and societal engagement into their curricula and organizational culture. The traditional focus on internal governance and discipline-specific development can limit opportunities for collaboration with other fields, making it challenging to adopt broader, more integrative educational and research initiatives.

To address complex global environmental and social issues, academic departments must open themselves to collaboration with other disciplines. This shift requires both students and faculty to move beyond their departmental boundaries, engaging in team-based learning and research with colleagues from diverse academic backgrounds. Such collaboration is essential for developing transdisciplinary teaching and research that can effectively tackle multifaceted challenges.

For higher education institutions to strengthen their societal engagement, it is critical that they work with local communities on the communities' terms. This involves accommodating local cultures, social structures, and perceptions, and ensuring that engagement efforts are responsive

²We are grateful to a reviewer for pointing out that the manuscript might prepare the reader for the eight proposals discussed below. In this way we alert the reader as well as possibly address the begged question of 'ok, so what do you propose'.

to community needs. By embracing a more inclusive and collaborative approach, academic departments can contribute significantly to the social relevance and impact of higher education.

HE's general reserve to embrace transdisciplinary studies and public engagement will require critical self-assessments in reenvisioning their futures. Re-envisioning HE transdisciplinarity and societal engagement is an opportunity to learn from examples of those HE institutions that are providing transdisciplinary curricula and societal engagement.

There are examples of transdisciplinary initiatives within universities. There are ample external examples of private and public institutions actively incorporating transdisciplinarity and societal engagement. These include government ministries and NGOs, who not only provide exemplars of transdisciplinarity but also are ready-made partners for HE outreach and engagement with society.

Again, transdisciplinarity is by no means new or particularly innovative. Within HE, transdisciplinarity has been on the outer boundaries of HE inquiry and discussion. For more than half a century, calls for transdisciplinary studies have been thorough and articulate (e.g., Jantsch, E., 1972; Lawrence, R. and C. Despres, 2004; Hadorn, G., et.al., 2008; Nicolescu, B. and A. Ertas, 2013; Brandt, P., et.al., 2013; Wolfram, M., et. al., 2013; Carroll, L., et. al. 2014; Watson, P., 2017; Rigolot, C., 2020; Roshania, R. P., et.al, 2023; Schneider, F., et. al., 2023). Yet, HE continues to lag in housing transdisciplinary initiatives and in supporting faculty and staff to step outside their narrower academic disciplinary workplaces and careers (see a special issue of the *Journal of Community Engagement and Scholarship*, 2022).

Institutional Approaches to Sustainable Public Engagement

Similar to transdisciplinarity, several national higher education (HE) institutions worldwide are making efforts to create and maintain sustainable organizational conditions that support long-term public engagement. These efforts reflect a growing recognition of the importance of connecting academic work with societal needs, ensuring that education and knowledge production have practical impacts on communities and stakeholders.

Two national HE systems serve as prominent examples of organizational support for societal engagement. First, the United States' land-grant universities, through their Extension services and agricultural Experiment Stations, have established a model of public engagement that extends back over a century. These institutions have played a critical role in supporting agricultural and food systems as well as community and youth development across the country by linking academic research with practical solutions for farmers, communities, and the broader public (see Swanson, L., et al. 2022).

More recently, the People's Republic of China (PRC) has implemented a national requirement for its agricultural universities to establish their own university-based Extension divisions and local agricultural experiment stations. By mandating these organizational structures, China is fostering stronger connections between universities and local agricultural sectors, mirroring the long-standing model found in the United States (Swanson, L., and K. Mao, 2020).

Weak External Public Demand and Recurring Maintenance of the Status Quo

Why is either transdisciplinary studies or societal engagement not more central to HE globally? Is external demand for HE graduates and for research deficient? Are there internal organizational structures and cultures which tend to conserve the status quo and push back against collaborative cross-disciplinary courses, curriculum, and societal engagement? We suspect that there are confluences of internal forces and an external range of disengaged external demand which result in reproducing the status quo. Maintaining the status quo is often easier than overcoming institutional inertia. Perhaps, but Gee and Gavazzi (2021) write that there are both HE organizational structures and culture governing internal change and that external demand not only exists, but these demands are giving way to intense societal critiques, at least in the US (also see Ostrom, 2020, *Journal of Community Engagement and Scholarship*, 2022; Gavazzi, S., 2025).

There are external conditions, often moral in character, founded on HE's own ethical codes, that provide rationales for acting. Among these are the large portions of the global population, especially among the most vulnerable, that do not benefit from or are even the attention of HE. The populations most at risk are the least educated. *There are seemingly forever gaps between higher education and the least educated.* These gaps are filled with misinformation or nothing much at all. The global populist critique of higher education focuses on arrogance, grievances of being left behind, and stigmatization. These are often misplaced though understandable criticism (Gavazzi, S., 2025). Our concern is that real engagement gaps occur among western universities and their global counterparts, including in China, India, Africa, the Americas, and everywhere else.

At this time, most HE institutions do not offer transdisciplinary degrees or team training (*Journal of Community Engagement and Scholarship*, 2022). At best, they just touch on transdisciplinary applied research or transdisciplinary community engagement, but *very seldom in tandem* (Reed, A. and L. Swanson, 2022). Transdisciplinary studies and off-campus engagement require campus-wide collaboration among faculty unfamiliar with one another's academic disciplines. Among challenges for HE are supporting and evaluating campus-wide teamwork focused on complex social and ecological issues (e.g., Read, E., et. al., 2022; Love, H., 2023; Cross, J., et.al., 2022). Yet were they to embrace transdisciplinary studies and societal engagement, they will enhance their financial and political resilience by providing practical real-world value for the public with whom they will be collaborating.

Benefits Versus Risks

Broadly, HE institutions do not have campus-wide public outreach and engagement portfolios designed to facilitate connections between campus and society. We propose that it is in the self-interests of HE institutions to meaningfully become a reliable partner on climate change, pandemics, food security, elimination of poverty, and a host of other transdisciplinary crises. Simply, global HE will benefit from systematically integrating on-campus talent via transdisciplinary education and research with off-campus community engagement and demands (e.g., Wolfram, M. et.al. 2013; Reed, A. and L. Swanson, 2022). This will not be easy, but the eventual benefits will provide new fiscal security and greater political legitimacy.

A characteristic of HE as 21st century cultural imperatives is their collective centrality for creating and disseminating cutting-edge knowledge and expertise that is both useful and necessary for community and market development and decision making. Their combined capacities for scientific and humanities education, research, and outreach offer fertile ground for nurturing and disseminating practical knowledge of complex cultural and locally grounded forces at work in society and ecosystems.

Defending the Status-quo: HE's Internal Pinch points

There are internal organizational and cultural hurdles holding back HE from capturing these possible futures (Fitzgerald, H., et.al., 2015; *Journal of Community Engagement and Scholarship*, 2022; Reed, A. and L. Swanson, 2022; Gavazzi, S., 2025).

Wrestling with complex societal and environmental issues is not a new undertaking for HE. What is tricky for higher education is recognizing and responding to the long-awaited emergence of political urgency, and therefore external demands, for greater off-campus involvement with other societal institutions. These available partners qualitatively better understand the value of collaboration in creating new value-added programs and community engagement. Of value to HE is learning from these possible partners off-campus experiences gained by working within the melee of intertwined complex local community, economic, and market struggles.

There are numerous internal organizational difficulties to consider. These include long existing administrative structures and campus-wide cultures which determine how faculty and students perceive opportunities for advancing their careers. These on-campus organizational structures and perceptions can and have weakened efforts to champion transdisciplinary curricula and off-campus engagement innovations. Almost all HE institutions can be characterized as making very low investments in either transdisciplinarity or public engagement (Gee, G. and S. Gavazzi, 2021).

Incorporating transdisciplinary curricula and research characterize holistic initiatives taking on issues like climate change, elimination of poverty, pandemics, and the host of other issues that span geography and societies. There are both needs and opportunities for knitting together HE's disconnected talent locked into academic departments. These can be unlocked by simply adjusting curricula and outreach programs to include direct teaching, applied research, and community engagement focused on difficult global and local issues. Included are familiar crises associated with climate and ecosystems transformations, human and zoonotic pandemics, endemic poverty and social justice issues, and food insecurity.

Institutional Structures and Their Influence on Academic Priorities

Among HE institutions, the primary governance unit is the academic department, which represents scholarly disciplines. Academic departments manage professional evaluations and advancement and determine their courses and degrees. Departments are aggregated within colleges. Within these units there are professional cultures and organizational rules (written and understood) that govern and guide daily and annual department life.



Bureaucratic systems, social structures, and institutional cultures collectively play a significant role in reinforcing and reproducing the core priorities of disciplinary education, research, and outreach. These frameworks not only shape the academic focus of higher education institutions but also exert a profound influence on the professional success of students, staff, and faculty. The qualitative outcomes experienced by members of the academic community are largely determined by how these organizational elements define and support institutional priorities.

When higher education institutions consider reallocating aspects of their mission and resources to address transdisciplinary issues, these efforts inevitably occur within the context of existing academic priorities. The social interactions and agency among institutional members further influence the direction and effectiveness of such changes. The collective actions and values within the institution set the stage for how transdisciplinary work is approached and integrated.

Given this context, academic departments emerge as the most logical starting point for initiating transdisciplinary efforts. However, academic departments also serve as potential organizational pinch points that can either facilitate or impede progress. As the primary units responsible for hiring, promotion, tenure decisions (where applicable), and curriculum approval and oversight, departments act as the first organizational and cultural filters for institutional change.

In decentralized academic bureaucracies, departments serve as gatekeepers. Their influence extends to fostering or discouraging cross-campus collaboration in both teaching and research, as well as supporting or restricting broader societal engagement. Through these roles, departments maintain organizational and cultural stability, helping to define and preserve disciplinary identities.

Ultimately, this dual function means that departments can act either as points of resistance or as drivers of innovation when institutions seek to expand transdisciplinary collaboration or pursue direct public engagement. Their position at the intersection of institutional tradition and potential change makes them critical actors in shaping the evolution of academic priorities and practices.

Options for department and college support for both transdisciplinarity and societal engagement include modifying existing rules regarding departmental teaching appointments, providing seed funding for cross-campus courses and projects, and streamlining approval processes for innovative courses – particularly prototype courses. However, departments alone likely will not cause campus-wide initiatives. Senior campus administrators also need to be facilitators and enablers. Senior leadership can support institution-wide incentives, including professional advancement incentives that support transdisciplinary studies. Both transdisciplinarity and societal engagement can enhance the centrality of both (Fitzgerald, H., et.al., 2015).

Investing in Transdisciplinarity and Societal Engagement

At this time, both transdisciplinarity and off-campus engagement and education are underinvested in and consequently undervalued (Trencher, G., et. al., 2014; Gee, G. and S. Gavazzi, 2021). Transdisciplinary education and applied research can be made accessible for outlier communities

and distant learners. Every available means for delivering knowledge to and collaborating with learners needs to be on the table, including widely accessible and no-cost online tools and curricula. Open-source publications and broad access to available knowledge (Woteki, 2022) coupled with appropriate applied research are impactful when found to be useful by the public and practitioners -- such as farmers, local NGOs, entrepreneurs, and families among many end users. All learners are target populations, regardless of systematic bias associated with gender, ethnicity, social class, and educational starting point. *This requires HE to take a deep dive into community engagement and outreach.*

The urgency for higher education to sustainably work with a wide range of publics is emerging as public awareness of personal and community consequences of climate change, pandemics, and other complex issues impact their futures. A deep-rooted acknowledgement of urgency may not as yet be at a tipping point. Until tipping points occur, embracing the benefits of transdisciplinary education and outreach will continue to be only thoughtful stretch-goal exercises. Presently, we are not overly optimistic that transdisciplinary studies will emerge within HE's internal organizational structure and cultures. External pressures may be more likely to trigger HE's organizational transformation.

Taking on campus-wide transdisciplinary studies can soften current hardened academic disciplinary boundaries. But it is more likely that these efforts will be resisted internally. Qualitative organizational change, such as rewarding team teaching, research, and engaged scholarship currently is not yet emerging as a normal path for professional advancement.

External demands for transdisciplinary education, research, and outreach are more likely to generate opportunities and stress for greater campus-wide and public engagement on transdisciplinary issues. It may be that as external stressors move onto campuses, these stressors will be perceived as threats to HE institutional rules for self-governance. The inertia of their institutional status quo – that is, how departments function day-to-day and annually, may not be favorable for extensive campus-wide collaboration and off campus engagement, regardless of how limited proposals may be at first. If so, it will be difficult for sustained transdisciplinary initiatives to emerge. *These are organizational pinch points.*

HE's Knowing-Doing Gaps

Competing organizational (structural bureaucratic) processes shape possible transdisciplinary futures. There are internal contradictions within HE which include continued defense of the status quo, disciplinary versus transdisciplinary education, and mounting external pressures for greater societal engagement. We think the urgency for nations to act on global transdisciplinary issues is self-evident and pressing. Moreover, most HE institutions presently have the talent and financial capacity to act. They have the foundations needed for simultaneously upgrading existing course curricula, degrees, and applied research for transdisciplinary outcomes. Yet, these capacities, as simple and straight forward as they may be, are as yet unrealized. *This adherence to their status quo is a 'knowing-doing gap'* (Pfeffer, J. and R. Sutton, 2000). HE institutions often declare they will move toward both transdisciplinarity and public engagement, but they are internally stymied in initiating internal processes to do so.

Intentional institutional policy shifts are required to bend existing departmental structures and cultures toward supporting their members' safe participation on *transdisciplinary teams*. Current evidence suggests that with a few exceptions HE is unlikely to join with other societal institutions beyond what they are presently doing. Their futures are more likely to simply extend their current status quo. Existing organizational structures and cultures are the best predictors for their near futures – which is more of the same. This maintenance of the status quo offers the least resistance for faculty, but it also continues to retain an expensive pool of natural and social science talent on campus – doing little for their immediate publics, including the most at-risk populations.

Determining alternative futures will vary for each institution. There are no, nor need there be, mechanistic one-size fits all alternative templates to draw upon. Assessing campus-wide capacity starts with examining each institution's priority missions. Globally, most HE institutions identify teaching and research as their core missions. But there are exceptions, including the US LGUs which incorporated a third mission of societal engagement (e.g., Extension and Experiment Stations). This model was incorporated during the post-WW2 by new nations creating agricultural universities. Societal engagement is a third mission among these universities. We propose there is a third mission for more traditional liberal arts and sciences universities.

Current global HE public engagement and outreach programs, if any, tend to be top-down extensions of university curricula and research (Reed, E., et.al., 2015; Reed, A. S. and L. E. Swanson, 2022). Working with communities and businesses (e.g., agricultural universities working with farmers and entrepreneurs) require team training curricula for off-campus collaboration that capture the learning and resiliency benefits of bottom-up input into institutional decision-making and course curricula. For classroom instruction these techniques incorporate evidence-based and off-campus teaching solutions (Love, H., et.al., 2023). If HE institutions presently have at best fledgling outreach and engagement programs, then their starting assets are less than ideal for building community partnerships. The promise is that even minimal investments in community engagement will have proportionately greater benefits for both the institution and the communities within which they are embedded (Fitzgerald, H., et.al., 2015; Gee, G., and S. Gavazzi, 2021).

The more each of these three mission areas are integrated for learners, faculty, and communities, with special attention given to the characteristics of their constituent populations and natural ecologies, the more public demand for these academic services will emerge and expand.

Current Capacity and Pathways Toward Institution-wide Transdisciplinary Missions

Exemplars of pathways for advancing the centrality of transdisciplinarity and societal engagement simultaneously are widely available but often unobserved or underdeveloped. This last section is dedicated to ways most HE institutions can advance institution-wide transdisciplinary teams and locate off-campus partnerships for societal engagement. We choose to first highlight student success and career enhancement for joining businesses, NGOs, government agencies, and social justice movements at the frontlines of the seemingly overwhelming challenges locally and globally.

We then share existing avenues for institutionally supporting students, faculty, and off-campus partners to work collaboratively while advancing their careers and talent. Lastly, we suggest how current curriculum and faculty talent can be augmented through special institution-wide academic units which provide certification, degrees, and professional development for businesses, NGOs, and governments.

Students: Developing Transdisciplinary Teams and Curricula

Futures emerge from existing histories and the daily interactions between people. Fayard, A-L., and M. Mendola (2024) note that cross-sector collaborations rarely succeed, bringing into focus identifying processes that can succeed. For universities to succeed “. . . they need to develop a culture of open innovation, experimentation and iteration, and value, which requires supporting teams that will champion the change and facilitate collaborations among the diverse actors of the innovation ecosystem” (Fayard, A. and M. Mendola, 2024, p. 1). Success will be shaped by HE’S organizational structures and cultures. Intentionally altering futures takes place in these daily and long-term social relationships. Figuring out how to move toward developing and linking transdisciplinary scholarship and community engagement starts in the trenches of academic life.

Love, et. al. (2021) report that undergraduate courses that emphasize teamwork in collaboration with an off-campus organization develop critical thinking, culturally grounded, and complex reasoning, communicate effectively, and apply concepts they learn to their future careers. Teaching and learning are HE’s primary missions. Developing learners’ critical thinking skills – teaching students how to learn and flexibly create and adapt knowledge produces problem solving skills. Academic degrees and other certified learning experiences are their products. HE’s organizational structures are designed to produce these educational outcomes (Love, H., et. al., 2019; Balsiger, J., 2015). These are existing assets for HE to build upon.

Short and long-term pathways toward transdisciplinarity include repurposing or restructuring some courses, degrees, and digital non-credit lifelong learning certificates (e.g., Balsiger, J., 2015). Fostering curricula adaptation for transdisciplinary topics builds support for institution-wide commitments, develops space for professional development, and encourages an institution’s cultural validation for transdisciplinary studies (see e.g.: Fitzgerald, H., et.al, 2015; Gee, G. and S. Gavazzi, 2021). Combining teaching with community engagement advances the skills of students to work in teams on transdisciplinary projects after graduation and with communities (Love, H., 2023). These may be challenging paths at the beginning – but they need to be trodden (Fitzgerald, H., et.al., 2015; Gee, G. and S. Gavazzi, 2021; Journal of Community Engagement and Scholarship, 2022).

Identifying and then following paths toward broader engagement of their courses, degrees, and outreach education can in turn provide greater demand for campus talent to join teams that include off-campus economic development institutions and government agencies. Initial institutional efforts can range from simply tweaking existing courses by including transdisciplinary case studies to establishing undergraduate and graduate degrees in transdisciplinary studies.

Significantly upgrading an institution's community outreach and engagement can include service-learning in coursework and working with off-campus youth development and citizen science programs. These off-campus innovations develop valuable post-graduate professional skills. Students should be prepared through their coursework for engaging local societies and producers as well as actively learning facilitation and team management skills. Collaboration and co-creation skills will be translated to society as students enter professional careers engaged in bottom-up community programming.

Transdisciplinary Teams

Cross campus collaboration and community engagement require well organized teams. Consequently, where better to begin transdisciplinary studies than learning how to work within the cultural and organizational demands of teamwork (Love, H., et. al., 2021; Cross, J., et.al., 2022; Read, E., et.al., 2022). Collaborating within a team is not always intuitive. It is learned. HE's forays into transdisciplinary studies include working within teams and collaborating with communities (Meadows, A., et.al., 2015; Ferguson, D., et.al, 2022; Love, 2021). Sustaining these institutional transitions begins with and continues with collaboration among campus-wide teams charged with developing broad transdisciplinary programs (Love, H., et.al. 2021; Meadows, A., et.al., 2015).

Again, academic departments have primary control over their curricula and the professional development of faculty and staff. Campus-wide programs benefit from departments willing to collaborate across campus. Without constructive internal discussions within academic departments, there likely will be resistance from faculty who control department decisions making.

Easy first steps include on-campus charettes, noted above, to aid in determining existing conditions followed by assigning campus-wide teams to find feasible options for infusing interdisciplinary and transdisciplinary topics into existing courses. These teams then can make recommendations for transdisciplinary degrees and certificates (Michigan State University, 2024). Outcomes include moving the institution toward new transdisciplinary courses, sub-degree certificates of knowledge, minor academic degrees, as well as both undergraduate and graduate degrees. Presenting humanities, sciences, and professional studies curricula together on transdisciplinary subjects assist in students developing critical thinking learning skills.

Academic Organizations: Centering attention on academic departments

Above, we highlighted the central importance for academic departments to open opportunities for their students and faculty to participate in transdisciplinary teams and engage with communities, businesses, NGOs, and government. Rather than acting as pinch points, departments can examine where structural and cultural *pinch points* exist that may restrain faculty and staff participation in transdisciplinary teams. This includes participation by members of academic departments. Are there existing paths for department members to work collaboratively across campus? Are there similar professional opportunities for faculty and staff participation in transdisciplinary studies? Are team members rewarded for their time commitment to transdisciplinary initiatives?

Academic departments are primary regulators of organizational change in HE and therefore can be primary linchpins in opening new opportunities for institution-wide teaching, research, and societal engagement. They alone are the principal administrative units responsible for nurturing and regulating an institution's academic talent. Collectively, they normalize an institution's culture. This makes them necessary partners in legitimizing and administering campus-wide interdisciplinary and transdisciplinary programs.

Certifying Transdisciplinary Studies and Engagement

HE institutions can create professionally applicable academic credit and degree options covering the breadth of possible pathways for transdisciplinary and community engaged scholarship (Fitzgerald, et.al., 2015; *Journal of Community Engagement Scholarship*, 2022). HE can tailor off-campus non-degree certifications for specific professional training for lifelong learners, including those in government ministries, NGOs, and entrepreneurs. Stepping toward transdisciplinary initiatives is signaled by conferring academic credentials to learners. Transdisciplinary certifications span numerous academic disciplines and include certifying learner expertise in teamwork and community collaboration.

Examples of formal certification include introductions to an academic disciplinary area (a group of a few courses), academic minors (working knowledge of a discipline), and degrees certifying a learner's mastery of multiple disciplines. For-credit certificates, minors, and majors can be earned while achieving undergraduate and graduate degrees. Off-campus professional training certificates (not certified for academic credit) options, particularly for life-long learners, strengthening their professional knowledge as well as foster teamwork training. For example, 'badges' can be used by learners to incrementally obtain certification of skills learned, including through mastery learning formats (Credly by Pearson, 2024).

Transdisciplinary Academic Units (TDAUs)

Though underutilized, most HE institutions have options for creating new academic units focused on complex transdisciplinary issues. Developing these flexible degrees and professional development options (including badges), institutions can create broad arrays of *Transdisciplinary Academic Units*. Creating TDAUs is a partnership among departments, colleges, and senior administration. Transdisciplinary degrees need not 'credential' a specific topic, for example, climate change or pandemic, do need to provide both training and processes for community engagement that advance students' topical knowledge and societal experience for working with government agencies, businesses, NGOs, and community development/engagement. Each HE institution can fashion TDAUs to their particular organizational structures and cultures.

TDAUs are flexible. They do not require their own faculty as is the case for academic departments. These alternative degree offering units are authorized to develop their own courses and degrees. They can bundle a range of professions or global issue specific certificates and degrees (ex: climate change, food security, poverty alleviation, and economic development) that respond to external demand for transdisciplinary education, knowledge, and team building skills. TDAUs are

dependent on participation by faculty with appointments in academic disciplines, and therefore dependent on departmental reward options that support faculty and staff participation. Faculty, departments, and colleges can participate as and when they choose. If an institution does not have the flexibility to create TDAUs, then tweaking their organizational manuals and codes will need to occur. Accordingly, TDAUs are designed to be adaptable academic credit offering units within otherwise highly structured and hardened disciplinary silos.

TDAUs provide institutions with the flexibility required for nimble adaptation of curricula to changing real world conditions. They are easily fitted to online digital venues, allowing institutions to reach much broader and distant audiences.

These special academic units allow students and off-campus learners to benefit from curricula that sharpen their skills in working across disciplinary boundaries with others owning similar broad interests. They provide training that benefits learners and their future employers. We believe students will gravitate toward academic certificates, minors, and degrees that prepare them for working within larger professional teams and with the public at large. Reciprocally, their likely employers will gain from their transdisciplinary skills.

In summary, transdisciplinary education and engagement does not and should not displace the primacy of academic departments. Nor should the primacy of academic departments limit an institution's taking on great global challenges through transdisciplinary courses and degrees. Participation in transdisciplinary studies is best supported by team members with strong disciplinary taproots who also work collaboratively with communities.

Research: Expanding Applied Transdisciplinary Research Opportunities

Applied transdisciplinary research includes the humanities, natural sciences, and social sciences. Added value for communities occurs when applied research is co-created locally, improves in its value for students, communities, and practitioners (One Earth, 2022; Lawrence, M., et al. 2022; Fischer, C., et.al., 2024; Duncan, R., et.al., 2020; Ferguson, D., et.al., 2022; Mejia, G., et.al., 2022; Wilmer, H., et.al. 2024). How institutions incorporate applied research missions varies greatly. Merging applied research into undergraduate and graduate curricula establishes avenues for students and extended campus learners to master within their coursework the requirements for scientific inquiry in their professional and daily lives. This can be accomplished through community programs such as 'citizen science' or 'translational science', the latter in the US are sponsored by colleges of medicine (*Journal of Translational Medicine*, July 2024). Effective applied research includes opportunities for students and faculty to learn from the knowledge owned by on-the-ground NGO practitioners and the vast resources of local organic knowledge.

Training Students, Faculty, and Off-Campus Partners in Teamwork

Team training may seem to be a high hurdle at first. However, experiential learning within team frameworks can beneficially leech into the institution's culture at large. Assisting the development of teamwork and applications of critical thinking through teaching, research, and outreach – learning how to learn – is an essential value of HE for individuals and communities.

Mastering a wide range of research skills within transdisciplinary curricula is augmented when engaging and learning from off-campus professionals, farmers, and businesses. Students will learn from academic disciplines as well as from community experts. Understanding research and learning skills expands the application and usefulness of academic degrees and training (e.g., Clark, B. and C. Button. 2011; Crowe, H., et.al., 2013; Cronan, C., 2022).

While not undervaluing the importance of basic disciplinary research, the application of existing knowledge for societal conditions provides immediate benefits for communities and individuals. Mastering applied research assists all learners to better manage complex issues. These benefits are strengthened when disciplinary and transdisciplinary programs are connected with off-campus professionals and communities (e.g., Owen, G., et.al., 2019; Pineo, H. et.al., 2021).

Creating structural support for teams and taking on the cultural benefits of collaborative transdisciplinary work off-campus can provide positive organizational shifts that enhance productivity and off-campus appreciation of academic enterprises (Love. H., et.al., 2023).

Challenges for HE Venturing into Community Engagement

Challenges exist for off-campus engagement and transdisciplinary studies (Reed and Swanson, 2022). Pfeffer and Sutton (2000) identify Institutional ‘knowing and doing gaps’ as a common disconnection for businesses seeking to connect policy aspirations with existing organizational rules and culture. They make a strong case that closing these gaps are doable and necessary. Coordinating transdisciplinary education and research is an option for bridging classes with applied research. Including service learning and research with communities will also close these gaps.

We need to make clear that presently advanced economies have challenges championing off-campus engagement or transdisciplinary studies (Reed, A. S. and L. Swanson, 2022; Gee and Gavazzi, 2021). But several nations have long identified direct community engagement as priorities in managing their ‘knowing and doing gaps’ for technology development and transfer for agricultural development.

US land-grant universities (LGUs), in partnership with the US Department of Agriculture (USDA), have a century and half connecting applied agricultural research and community-based Extension services (Swanson, et. al., 2022). US LGUs have served as exemplars since World War 2 in agricultural education and youth development. The US LGU system is as diverse as their state and environmental diversity. This said, the fact that US LGUs are locally specific to their state’s culture, population, and environment cannot be directly transferred elsewhere. They also have their challenges. Ostrom, M. (2019), while calling attention to the historical roots of US LGU dedication to societal engagement, also suggests that US LGU Extension and Experiment Station services have structural and cultural pinch points. Swanson, et. al. (2022) describe the history and challenges for US LGUs and maintain that these universities continue to be highly useful examples and reference points. Also, it is important to understand that none of these organizational pinch points are fatal or expensive -- just the opposite.

HE Is Not Alone: Local and Global Partners

We have emphasized that ‘transdisciplinary’ is an academic term which is linked to academic departments. Government, NGO, and private sector institutions presently are simultaneously using transdisciplinary teams and focusing on local social and ecological conditions, without reference to transdisciplinarity.

Government ministries, NGOs, and private sector companies are the global leaders in assembling broad expertise, experiences, and social institutions to address regional and local engagement with their clientele. These off-campus organizations coordinate professional and community-based teams, pulled together to optimize their core missions, including their mission to adapt available knowledge and technologies to local and regional conditions. Global HE has experience partnering with these development agencies. For example, the *Association of Public and Land-grant Universities* (APLU), a North American public research university consortium, champions off-campus engagement as a priority equal to teaching and research for their member institutions. More than a decade ago, APLU sponsored a whitepaper on the centrality of university engagement (Fitzgerald, H., et.al., 2015). More recently, the *Journal of Community Engagement and Scholarship* (JCES, 2022) dedicated a special issue to transdisciplinary studies focusing on US land-grant universities’ century-old agricultural Extension services. There continue to be ‘knowing-doing gaps’ among these North American universities (Reed, A. S., et.al. 2015)

Worldwide, government agencies, NGOs, and businesses are practicing both transdisciplinary programming and community engagement. This is where transdisciplinarity and societal engagement is and has been flourishing. An example of NGOs collaborating with national and international government agencies is the *Global Forum for Rural Advisory Services* (GFRAS, 2024). Facilitated by the World Bank more than two decades ago, GFRAS is a confederated international platform for local and regional rural advocacy NGOs. Its mission ‘is to provide advocacy and leadership on pluralistic and demand-driven rural advisory services for sustainable development’ (GFRAS, 2024). GFRAS is regionally organized. But only the North American region is directly associated with existing HE Extension services. *Digital Green* (2025), another international NGO, is collaborating with government ministries in disseminating digital platforms and technologies to minimally resourced farmers and communities. *Digital Green* is engaging some of the least educated farmers around the globe. Their programs provide the latest educational training to the Ministry of Agriculture Extension services who in turn train farmers and rural people.

The largest ready-made community engagement partners for HE is their national and regional government ministries which supervise local programs supporting environmental sustainability, food systems, health, urban and rural development, and family/youth/community well-being as dedicated institutional missions. Most government ministries have regional and local offices providing programs committed to climate change, pandemic response and amelioration, and other familiar global emergencies.

This highlights a common challenge for cross ministry collaboration with HE institutions. With the exception of Western Europe and North America, but certainly among most post-WW2 new nations, public HE institutions are administered nationally by Ministries of Education (MoEs). National ministries focused on transdisciplinary issues are generally weakly connected to MoEs. These weak connections are another active gap that lessens community and environmental engagement with HE. But there is an important example of a national government requiring greater inter-ministry collaboration (Swanson, L. and K. Mao, 2020).

The People's Republic of China's initiative to established '*New Rural Development Institutes*' (NRDIs) within their 39 agricultural universities is an excellent example. This initiative is an example of a nation drawing on the US LGUs experiences but adapting the best practices and lessons learned to the great diversity among their provinces and national government.

China's *Ministry of Agricultural and Rural Affairs* (MARA) operates one of the largest Extension services in the world. Historically, MARA's Extension service was not well aligned with the Ministry of Education's (MoE) agricultural universities (Swanson and Mao, 2020). This changed during the 13th Five Year Plan (2016 – 2020). The NRDIs are modeled after US LGUs Extension services and Experiment Stations. China's central government is akin to many other post-WW2 new nations in Africa and Asia. In strategically mandating local and regional cooperation between MARA's Extension services and research professionals and MoE's agricultural universities' fledgling university-based Extension NRDIs China is very worthy of attention. Collaboration between their MARA services and agricultural universities is expected to assist national five-year plans that address rapid structural transitions of their farming systems, mending their environments, and eliminating rural poverty (Swanson, L. and K. Mao., 2020). China is intentionally addressing one of their 'knowing and doing gaps.' Each of these policy initiatives are transdisciplinary and require sustainable HE collaboration with communities. China is working toward transdisciplinary HE education coupled with university-wide public engagement. It can be done.

Global HE can more efficiently and effectively partner with their national development ministries, NGOs, and private sector businesses. There are no indications that these off-campus institutions are unwilling to collaborate across transdisciplinary issues. Such collaboration is both strategic and convenient.

What Might Collaborating with National Ministries and NGOs Look Like?

There are models for future HE paths to simultaneously advance transdisciplinary education and research with community education and engagement. Among many paths, we highlight four: 1) blending classroom instruction and transdisciplinary degrees with direct student engagement with local communities, 2) blending HE's professional talent with national ministries in upgrading frontline professional development in partnership with NGOs, private sector professionals, and MoA Extension personnel, 3) mobilizing widely available communications technologies for universal access to digital platforms with open access information aimed at public school teachers, farmers, entrepreneurs, and families, and 4) vastly expanding collaboration of HE with rural and urban healthcare providers and women's organizations to improve the quality of life and life chances for at-risk girls and women. There certainly are many additional worthy examples.

Bridging Knowledge Gaps Through Continuous Training and Collaboration

Off-campus organizations play a crucial role in advancing continuous training programs designed for development agencies and in enhancing community-wide educational capacities. By focusing on ongoing professional growth, these organizations enable development workers to remain current with the latest skills and knowledge required for effective community engagement and problem-solving.

Persistent disparities in knowledge between developed and less-developed economies continue to pose significant challenges to improving life opportunities and achieving ecological sustainability on a global scale. Overcoming these gaps is vital for enabling communities to adapt to changing circumstances and to pursue sustainable development goals.

Importance of Upgrading Professional Skills

The continuous upgrading of professional development skills is essential, particularly in areas such as teamwork and collaborative problem-solving. This ongoing education supports the rapid dissemination of critical knowledge related to soil health, climate change, water conservation, and economic development. As a result, efforts to alleviate rural poverty are strengthened through more effective and informed action.

Higher education institutions possess the talent and resources necessary to contribute significantly to the lifelong training of locally based professionals and community members. By collaborating with these individuals—who work directly with families, farmers, small-scale urban and rural entrepreneurs, and health professionals, higher education can help ensure that the latest knowledge and appropriate technologies are effectively transferred and applied at the local level.

Expanding Access to Knowledge and Professional Development

The effectiveness of making knowledge and technologies available to local farmers, women, and entrepreneurs is directly linked to the expertise of Extension agents and NGO field operatives. Their understanding of complex issues determines how successfully these resources are adopted and utilized within communities, highlighting the importance of investing in their ongoing education and capacity building.

Knowledge and practical information have become increasingly accessible across the globe. Numerous open sources of knowledge and appropriate technologies exist, providing opportunities for digitally assisted diffusion within emerging economies (Woteki, 2022; Digital Green, 2024). Private sector open-source publications, such as this journal, exemplify the growing availability of valuable information. Non-governmental organizations (NGOs) and private sector professionals are leveraging affordable communication technologies, including cell phones and social media platforms, to deliver timely production, market, and weather updates. This approach effectively reaches populations with limited educational backgrounds, empowering them with essential information.

Summary Thoughts

Higher Education (HE) institutions possess extensive talent pools capable of directly supporting NGOs and private sector entities in accessing and applying both existing and emerging knowledge and technologies. As certifiers of expertise, HE institutions can offer a variety of pathways for professional development. One innovative method involves incremental, systematic mastery certification through curricular badges—discrete segments of current courses—that can be combined to create tailored professional development upgrades for specific local and regional needs. These structured learning paths can lead to new transdisciplinary degrees or enhance traditional disciplinary degrees with transdisciplinary training, thus broadening professional competencies and adaptability.

HE is more than the suppliers of advanced academic degrees and certificates. They generally support educators for their communities' youth through community-based and volunteer youth education and development programs. The US LGU Extension system's youth development 4-H program is an available example of a century of HE is working directly with elementary and high schools, broad community citizen science programs, and STEM training.

Attention can be given broad community engagement that levels playing fields for the most at-risk youth and adults. HE can directly assist these less educated populations, in collaboration with other educational institutions, to amplify educational opportunities as pathways toward improving their daily lives and work. This is an accessible future for global HE, but one best realized in collaboration with other social institutions.

Higher education (HE) is currently confronted with several substantial gaps that need to be bridged in order to advance its broader mission. One of the most significant challenges is the internal "knowing-doing gap." This gap highlights the disconnect between the stated ambitions for transdisciplinary education and public engagement, and the actual implementation of these goals within academic institutions.

Although there is widespread acknowledgment of the importance of transdisciplinary approaches and meaningful engagement with the public, these objectives frequently remain unfulfilled. The aspirations that institutions identify for themselves are often not translated into concrete actions or outcomes. As a result, the potential impact of higher education in these areas is diminished, underscoring the need for focused efforts to close this knowing-doing gap and realize the full promise of HE's mission.

Another longstanding concern is the persistent divide between higher education institutions and the least educated segments of society. This gap is not new, and it continues to limit opportunities for those who are most in need of educational advancement and social mobility.

Collaboration remains a critical strategy in bridging these divides. The partnership of HE talent and students with communities—particularly those that include at-risk populations such as women

and individuals experiencing chronic poverty—can help address the grinding hopelessness that often accompanies persistent disadvantage. While higher education institutions tend to serve populations that already possess significant educational capacities, it is equally possible—and necessary—to engage with less educated populations.

Some of these educational gaps may appear to be deeply rooted in national cultural heritages, including those associated with gender-biased educational and employment opportunities. These are fundamentally social justice issues, and their persistence highlights the need for targeted efforts to promote equality and inclusion.

The Path Forward: Emphasizing Collaboration

Importantly, none of these gaps should be considered inevitable. They can be closed through intentional and sustained collaboration among higher education institutions, students, and the broader community. By working together, stakeholders can ensure that the benefits of higher education are accessible to all, regardless of prior educational attainment or social status.

Limitations of This Study

While formulating our proposals, we have encountered fair criticisms, particularly concerning the implicit assumptions that cross-campus collaborations and active public engagement are self-evident and straightforward to implement. These critiques highlight a crucial need to recognize the complexities involved in fostering such initiatives.

Our experiences indicate that higher education institutions must act deliberately and, at times, embrace significant innovation. This approach is essential for reallocating resources in support of transdisciplinary work and for building deeper connections with society. Such changes are not automatic; they require intentional strategies and resource commitments to be effective.

Facilitating team teaching, collaborative research, and engagement with the broader community will likely necessitate revising existing operational rules. These adjustments will demand substantial deliberation and coordination at both the department and campus levels, as decision-makers work to support and sustain these collaborative efforts.

We agree that too much attention can be given to simply facilitating collaboration and teamwork. Alone, HE institutions may not have the energy and vision to alter existing status-quos. Moreover, we make the case that HE will benefit from societal demands for greater attention to practical solutions for local and regional challenges. Alone, HE is vulnerable to external social forces that devalue education, research, and societal engagement missions, relegating HE just another political interest group. HE institutions are products of their national histories, cultures, and political economies. Impactful collaboration requires both HE and the societies that created and sustain them to underwrite collaboration.

HE institutions are expensive national social and cultural imperatives. They are required by their societies to add great value through their education, research, and public engagement, particularly when directed at great issues impacting members of a community. HE is a primary creator of knowledge and technological innovations, a key characteristic of their global status as cultural imperatives.

Among the three conceptual building blocks, both organizational structure and culture are apparent and understandable. It is individual and collective social agency that is less understood. Yet the power of social agency holds important clues for creating leadership and organizational pivots. People are the authors of social agency, whether a single person acting with purpose or social movements creating legitimacy for significant change. Social agency may well be the most important available resource for creating transdisciplinary education coupled with community engagement.

There are many pathways for HE to choose from. Ours include pathways offered by TDAUs and the seamless integration of education and research with community engagement. By design, TDAUs can focus on team structured humanities, social science, and natural science collaboration in collaboration with communities. Institutional community engagement is even more encompassing. Connecting classrooms with communities and ecosystems are opportunities for both disciplinary and transdisciplinary education.

An advantage of HE is the impact of their alumni's careers after graduation. Embedding transdisciplinarity within their curricula and providing opportunities to work on teams and directly experience the complexities and messiness of working with communities enriches the problem-solving skills of all involved. Developing critical thinking and group problem solving skills provides improvements in all social organizations they work and live withing. Moreover, alumni offer direct feedback to their institutions for improving their education, research, and engagement capacities.

This overview includes practical challenges and limitations. Our examples come from North American, Chinese, and western European HE institutions. These are case specific examples and cannot be assumed to translate universally to all HE institutions. We place importance on each HE institution working within its national and local contexts. While this allows for a vast diversity of options, each institution is unique and will need to navigate its own structural, cultural, and human agency conditions.

This is particularly notable in continuing resource constraints among HE in the global south. China and the US examples used here benefit from considerable resource and political support for both transdisciplinary and societal outreach initiatives. These are constraints but they are not inherent barriers, especially if HE increases their relevance for society, especially those sectors most at risk and through public engagement provide pathways for students and communities to better understand the complexity of transdisciplinary challenges.

Alternative Futures

Higher Education's (HE) future is closely tied to the efforts of its partners who are already deeply involved with local communities. These partners, ranging from government ministries and non-governmental organizations (NGOs) to private sector entities—are not only committed to working within communities but are also actively addressing the complex, interdisciplinary challenges that arise. HE has a broad capacity to support these efforts, making it well-positioned to contribute meaningfully to ongoing initiatives.

Engaging more directly with communities may challenge some established disciplinary norms and perceived imperatives within HE. However, such engagement also opens up new opportunities and futures for both HE institutions and the communities they serve. By stepping beyond traditional academic boundaries, HE can play a pivotal role in shaping collaborative and innovative solutions.

One of the most significant cultural gaps to address is the need to earn the trust of communities. While there is a willingness among various partners, including government ministries, NGOs, and private sector organizations, to assist HE in forging these connections, establishing genuine trust remains essential. By prioritizing trust-building, HE and its partners can lay the foundation for sustainable, impactful collaborations.

We are hopeful that academic disciplines can and will see beyond guardianship of their narrower range of inquiries and will become significant contributors of transdisciplinary teams across their campuses. These should be genuine opportunities within their organizational structures and cultures. Engaging broadly with communities, as an equal partner co-creating possible futures, will be a more non-intuitive leap. But these leaps have been underway via university-based Extension services and past collaboration with national government Extension services for more than a century. This is not untried territory. One pathway not discussed in this article is promotion and tenure systems where professional advancement opportunities for faculty are defined and often are unsupportive of faculty participation in either transdisciplinary projects or community engagement. For these pathways to be fully realized, the rewards structures for faculty at their institutions will change. Faculty, staff, and student professional and career pathways will be incentivized and rewarded.

We began by emphasizing the importance of a future in which higher education (HE) prioritizes both transdisciplinary studies and active societal engagement. In contrast, a future that does not assign equal value to these areas effectively supports scenarios where the influence of higher education, often the greatest concentration of scientific and cultural expertise within a nation, is diminished.

The divide between higher education and the least educated segments of society remains substantial. This gap presents significant institutional and moral challenges. However, these very challenges also offer substantial opportunities for transformation and improvement.



If the current status quo within higher education institutions continues, it is unlikely that more inclusive and impactful futures will materialize. The persistence of existing structures and practices would prevent the emergence of futures shaped by broader participation and relevance.

Despite these challenges, there is reason for optimism. We remain hopeful for alternative futures for higher education, futures that are built upon a firm foundation of transdisciplinary education and meaningful community engagement. Such a reimagined approach holds promise for bridging divides and ensuring that higher education fully realizes its potential in society.



About the authors:

Louis E. Swanson, Ph.D., is Professor Emeritus of Sociology and Vice President of Engagement (VPE) Emeritus at *Colorado State University (CSU)*. Previously he taught at the *University of Kentucky*. His research focuses on social and economic transitions in US agriculture and rural communities. At CSU he also served as Department Chair and Associate Dean. As the first VPE at CSU, He managed CSU Extension, *CSU Online*, *Economic Development*, the *Colorado Water Center* and international programs with China and Ethiopia. He served as a *Peace Corps* Volunteer in Tunisia, is an Outstanding Alumni of *Pennsylvania State University's College of Agricultural Sciences* and serves on the ACES Board.

Arthur Scott Reed, Ph.D., is Professor Emeritus of Forestry and former Vice Provost for Outreach and Engagement at *Oregon State University*. His career began in the private sector, where he first recognized the power of partnerships with Land-grant Universities (LGUs). Throughout his academic and leadership roles, he championed public-private collaboration, multiple ways of knowing, and shared decision-making. Reed has served at three LGUs, each with responsibilities in their *Extension Services*. At Oregon State, he helped launch the multi-institution *Sustainable Forestry Partnership* and co-created the innovative *Open Campus* model linking the university with community colleges and county governments.

Hannah B. Love, Ph.D., received her doctoral degree from *Colorado State University* in Sociology. She is co-founder of Divergent Science LLC. Since 2010 her facilitation practice has spanned higher education, water conflict, and science facilitation. Her background includes work in higher education administration, student affairs in higher education and non-profit fundraising. As a scholar, she publishes SciTS studies using social network analysis of teams to understand the processes teams use to create new knowledge.

William F. Shuster is a Clinical Professor and Dean's Distinguished Teaching Scholar in the College of Business at *Colorado State University*. Through his classes and collaborative efforts with community leaders and Extension agents, he has played a key role in linking students to businesses and local government. These connections not only enhance students' educational experiences but also foster meaningful relationships that create public value and benefit the wider community. Shuster also serves as Executive Director for *CState Consulting* and *Sonny Lubick Leadership* and shares his expertise on the *Harvard Business Review Advisory Board* and *Fortune Global Advisory Panel*.

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