The concept of Global Transformation Labs

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Abstract
Global Transformation Labs (GTLs) are intended to be arenas, where students, teachers, researchers and various societal partners come together to explore and experiment with new collaborative ways of addressing global challenges and contribute to green and just transitions. The GTLs are thought to be spaces for mutual learning and reflection and places where participants can engage as change-makers, taking initiative, testing ideas and developing innovative approaches to complex societal challenges. The aim is to enhance the global perspectives of all participants, strengthen their understanding of human, societal, and

planetary predicaments and opportunities, build their capabilities to navigate, act and contribute both creatively and responsibly in a changing world, and to drive transformation.

This white paper presents a generative vision and an initial conceptual framework as a basis for further exploration through critical and creative conversations and co-development by interested partners.

Keywords: Global Transformation Lab, Transformation, Education for Sustainable development, Challenge driven education

1   Introduction

For almost a decade, a close collaboration has been going on between Botho University (BU) in Botswana/Lesotho, the Royal Institute of Technology (KTH) in Sweden, Strathmore University (SU) in Kenya, and University of Dar Es Salaam (UDSM) in Tanzania (see: www.kth.se/gdh). Together, a vibrant community focusing on testing innovative pedagogical approaches and new models of collaboration has been built up, aiming to explore how the role of the university can be transformed into one where students and staff are better equipped and empowered to actively contribute to societal transitions towards sustainable futures. Through joint development of approaches to challenge-driven education, faculty trainings, student mobility programmes, and annual or biannual conferences where ideas and experiences have been shared, and a vast number of challenge-driven student projects, this community has developed into a strong and trust-based network (Rosén et.al. 2022, Högfeldt et.al. 2019, Ibwe et.al. 2017). What began as a KTH-initiated network coordinated by the KTH Global Development Hub (GDH) has evolved into a truly mutual community, where learning is reciprocal and co-created. As a result of this long-standing collaboration, the concept that we call *Global Transformation Labs* is emerging as a means to further enhance these activities and aims. The GTL concept is inspired by and grounded in the collective experiences built over the years, and hubs and centres that have been established at the respective institutions such as the Y4C Innovation Hub at UDSM and Openlab at KTH. The GTLs are envisioned as platforms for transformation, designed to be tested, evaluated, and further developed. This paper aims to share thoughts and ideas that help frame this concept, much like a white paper intending to invite discussion, critique, and co-creation. Section 2 elaborates on the problem landscape that motivates the need for such an initiative. Section 3 sketches the GTL concept. Section 4 theorises the transformative and self-evolutionary potential. Finally in Section 5, we describe our current stage of development, share some brief insights, and outline the next steps we will take to further evolve the concept — ensuring that the GTL lives up to its full intended potential.

2   Societal Needs and the Role of Universities

"Civilization is at a unique moment, a juncture. Pandemics, wildfires, and wars swirl around us as we write, sure signs that societies remain extremely vulnerable to shocks despite unprecedented progress. Beyond the immediate turbulence, we are in the midst of a planetary emergency of our own making. … Can 'we' - meaning all people and peoples - come together to navigate this century? Can we take a collective leap in human development with courage and conviction? Can we overcome divisions, neocolonial and financial exploitation, historic inequalities, and deep, deep distrust among nations to deal with the long-term emergency? Can we achieve systemic transformation in decades, not centuries?"

This quote from the 'Earth for All' report (Dixson-Declève et al 2022, pp. 1-2) effectively captures the critical situation of our planet and society and poses a set of fundamental questions to humanity. Universities have for long positioned themselves as positive forces in society, contributing knowledge, innovation, and talent to address societal challenges. Yet, it is important to acknowledge that universities in general are also deeply embedded in and, at times, complicit with the development trajectories that have led us to the "planetary emergency of our own making" where climate change, biodiversity loss, pandemics, economic and social inequalities and instability, and war, degrade humanity's prospects and may lead to systemic breakdowns (Lawrence et al., 2024). If universities are to play meaningful roles in the future, they must both respond to

external challenges as well as look inward and examine their own values, structures, and modes of operation. As UNESCO (2018) puts it:

"*The learning environment itself must adapt and apply a whole-institution approach to embed the philosophy of sustainable development. It involves rethinking the curriculum, campus operations, organizational culture, student participation, leadership and management, community relationships and research*."

Transformation, both of society and of the university, does however not come easy. It requires courage, humility, willingness, and new alliances. It also requires universities to rethink how education, research, and innovation are approached: in what contexts, under what assumptions, toward what ends, who is involved in shaping ideas and technologies, and whose needs are prioritized?

3   The GTL Concept

Building on pragmatism as a philosophy of evolutionary learning through continuous inquiry, reflection, deliberation and experimentation (Ferraro et al 2015) the Global Transformation Labs are intended to be arenas for collaborative experimentation on transformations within as well as through education, research, and innovation. The idea is to bring together students, teachers, researchers, and representatives from industry, public sector, and the civil society, to jointly identify and formulate deep questions and perspectives on global challenges, and co-create new knowledge, ideas, interventions, and solutions. A key ambition is to accelerate systemic transformation guided by the principles of sustainability, frugality and regeneration, which are increasingly recognized as essential innovation drivers (e.g. Weyrauch & Herstatt, 2017; Hossain, 2018). These principles promote circular, resource-efficient, and socially regenerative design, supporting transitions that are not only sustainable, but also equitable and resilient.

The GTL concept is intended to be **Global** in the meaning acknowledging planet Earth as our common home and the ongoing "planetary emergency of our own making". It is intended to serve as arenas for meaningfully addressing dysfunctions, tensions and risks, as well as opportunities, of our globally interconnected society and the entangled complex challenges humanity is facing. This will require capacity to zoom out to understand complex systems at a global level, identifying structural patterns and long-term dynamics, and zoom in to local contexts where the impacts of these global issues are experienced and where meaningful transformation can begin. Such multi-scalar perspective shifting is essential for developing understanding and interventions that are both context-sensitive and systemically relevant and significant. The global dimension is further reflected in the diversity of participants, representing various regions across national, cultural, and other, borders and barriers. The GTL concept is intended to be **Transformative** by promoting transformative learning among all involved actors, developing key sustainability competencies (Bianchi et al., 2022). It is further promoting inter- and trans-disciplinary approaches and innovations that go beyond 1st order changes that are '*doing things better*' through optimization and technology shifts, towards 2nd and 3rd order changes that are examining and changing norms, assumptions, and values and enabling '*doing better things*' and '*seeing things differently*' by also challenging prevailing worldviews and paradigms (Sterling 2011). As **Labs** the GTLs will be physical spaces for knowledge sharing, reflection, and learning, where actors collaboratively explore and experiment with innovations and ideas. One GTL can preferably have several closely interconnected nodes physically located at different partner universities.

As illustrated in Fig 1. the activities within a GTL are thought to be structured in three major interrelated activities. At the core are 'Transformation-driving projects'; it could be challenge-driven project courses for undergraduate students, final year BSc or MSc thesis projects, or doctoral student or senior research projects which run in parallel or interconnected in various ways. Critical questions and challenges to be addressed by such projects are identified and framed in the 'Think tank' which is constituted by students, academics and representatives from industry, public sector, and the civil society that populates a GTL with a joint interest in the focus area of that particular GTL. The focus area and identity of a GTL should involve complex global-local tensions and opportunities and could for example be a certain nexus area such as 'food-water-energy' or

certain "leverage points" or "regenerative interfaces" i.e. critical points where multiple forces interact, and interventions are more likely to have the most significant impact. The 'transformation-driving projects' generates learning outcomes and project outcomes, some which can be taken further through various 'Post-project actions'. As illustrated in Fig. 1 there will also be various other activities such as seminars, workshops, and trainings, that are more or less closely related to certain major activities. To promote openness and inclusion it should also be possible for students and others who are not directly involved in the activities to 'hang around' to get acquainted with the activities and the GTL members.

The organizational structure is meant to be shaped by personal agency, as participants actively design and evolve their roles over time. Students, young professionals, and early-career faculty are encouraged to lead the way, supported by the guidance and encouragement of more experienced peers. In addition, it is important to set up a business model grounded in shared risk and collective benefit. By maintaining transparent financial practices—often referred to as "open books"—we continuously assess and discuss the value and contributions of each participating organization. Recognizing that resources vary among participants, we encourage contributions—financial or otherwise—that align with each organization's capacity and strategy.
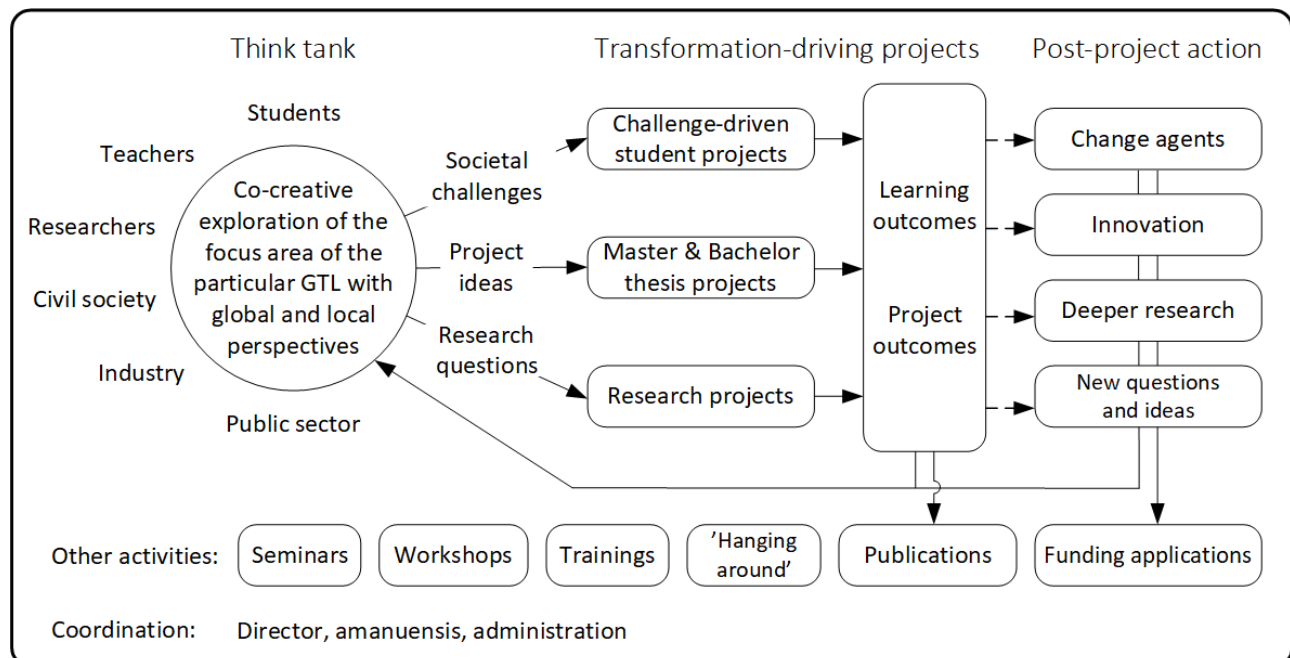

Figure 1: Sketching the organisation and activities of a GTL.

4   Built for Change: How GTLs Drive Transformation by Design

The GTL concept and its transformative and self-evolutionary potential can be explained in relation to the sociological concept of *robust action*. As Ferraro et al. (2015) suggests, disruptive transformative systemic change can emerge through incremental development, where small steps open the way for further advancements. As Ferraro et al. (2015) highlights, this will however require fruitful dynamics between the three interlinked strategies illustrated in Fig. 2 and outlined in the following:

*A **participatory architecture***, i.e. a structural dimension for bringing the stakeholders together, both at a point in time and over time. As described above, such architecture is already in place since the GTL concept has emerged from the deep long-term partnership between the four involved universities. The aim is to further strengthen the transformative collaboration within the existing network, while gradually expanding the community by inviting additional academic institutions and societal partners, and creating new platforms and formats for collaboration.

*A **multivocal inscription***, i.e. principles, policies, methods, etc, that frame the principal direction of the activities and facilitate experience sharing and articulation, discussion, and negotiation of meaning across the different actors, times, and places. Taking a starting point in the conceptualisation outlined in this paper and the experiences from collaborating on challenge-driven education and research, the multivocal inscription is thought to be subsequently co-developed by the GTL actors based on mutual learning and complementary frameworks and agendas, for example the EU GreenComp sustainability competency framework for framing learning needs and opportunities (Bianchi et al., 2022) and the *Earth for All* report for framing transformative needs and opportunities (Dixson-Declève et al. 2022 which in turn builds on fundamental work such as Meadows et al. 1972, UN 2015, and Richardson et al. 2023).

Distributed experimentation in specific projects whereby the actors collaboratively address certain global challenges and also improve their capacity for subsequent problem formulation and problem solving. The approach is intended to be life-centred (rather than merely human-centred), action-oriented, and grounded in—while also promoting—systems thinking, critical thinking, sustainability transitions, global competence, frugal innovation, and the navigation of wicked problems. By reflecting on both successful and less successful outcomes, we not only build collective knowledge about how to foster sustainability and transformations but also gain valuable insights into how the GTL concept itself can be better designed and made more relevant.
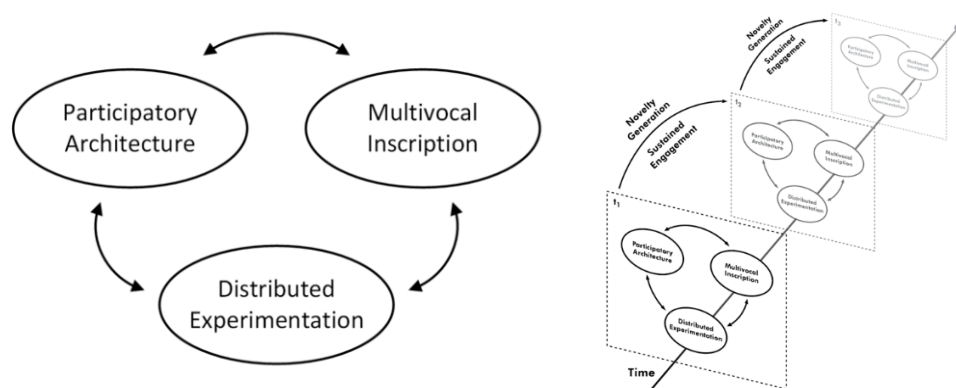

Figure 2: The three interacting strategies of robust action (Ferraro et al 2015).

5   Moving forward – Implementation and Follow-up

The first GTL prototype was initiated by the KTH Global Development Hub and tested in 2024 together with KTH teachers, three Stockholm-based industries and institutes, and students from KTH, Strathmore, Botho, as well as other international students on exchange at KTH. Another round of prototyping is going on during 2025, and dialogue is going on between the partners on how to develop joint GTLs. In many ways, the concept can be considered a success, as all involved stakeholders, including the organizing institution (KTH), expressed a clear desire to continue and further develop the model for a second year. Industry partners for example expressed that they saw a great value for their employees engaging in GTL activities to develop broader understanding of society and futures thinking. They also saw in connecting their involvement in GTL activities to their internal career development and life-long learning programs. Students for example expressed that this was the first time during their studies that they experienced educational activities where they took part as full humans, as opposed to attend as ´brains´, and becoming graduates, where the whole range of earlier life experiences was valued and useful in the projects. Teachers were for example positive in seeing students utilising the physical space in new and creative ways but on the other hand also saw clear limitations in students' as well as external stakeholders' knowledge and methods related to governance in complex contexts.

Key in the further development and implementation of the GTL concept will be to studying, evaluating, and researching whether and how it delivers on its ambitions. The key research questions we aim to explore

include several dimensions. In terms of governance of the participatory network, we are interested in understanding what conditions enable successful initiation of GTLs across diverse contexts, and how co-leadership models can balance power and promote equity between different partners, between academic and societal actors, and empower students to not only be beneficiaries of education but also take leading roles in transforming education and society (Niessner & Rosén 2025). In the area of distributed experiments, we seek to understand how GTLs support transformative learning among students as well as among involved educators and professionals. We also aim to identify which competencies are most critical in driving systemic change across various thematic nexus areas. From an innovation and impact perspective, we investigate how GTLs function as innovation ecosystems—what types of innovations they generate and through which mechanisms these innovations can be scaled or deepened for greater impact. Finally, we consider it essential to find out how GTLs can be durably accepted and embedded within existing structures while at the same time critically and creatively contributing to transforming those structures, and which organizational models are suited to support their long-term evolution.

6 References

Bianchi, G., et al. (2022). GreenComp The European sustainability competence framework, Punie, Y. and Bacigalupo, M. editor(s), EUR 30955 EN, Publications Office of the European Union, Luxembourg, 2022, ISBN 978-92-76-46485-3, doi:10.2760/13286,

Dixson-Declève, S. et al. (2022). Earth for All: A Survival Guide for Humanity. A Report to the Club of Rome. New Society Publishers.

Ferraro, F., Etzion, D., and Gehman, J. (2015), Tackling grand challenges pragmatically: Robust action revisited, Organization Studies, Vol.36, No.3, pp. 363-390.

Global Development Hub (www.kth.se/gdh) *last retrieved 250703*

Hossain, M. (2018). Frugal innovation: A review and research agenda. *Journal of cleaner production*, *182*, 926-936.

Högfeldt, A.-K., Rosén, A., et al., (2019). Mutual Capacity Building through North-South Collaboration Using Challenge-Driven Education", Sustainability, vol. 11, no. 24.

Ibwe, K., Kalinga, E., Mvungi, N., Kelati, A., Tenhunen, H., & Dhaou, I. B. (2017). The role of challenge driven learning in activating industry-academia cooperation in low-income countries. Proceedings ICERI2017 (pp. 8158-8166). IATED.

Kezar, A., et al (2018). Communities of Transformation: Creating Changes to Deeply Entrenched Issues. The Journal of Higher Education (Columbus), 89(6), 832–864.

Lawrence M, Homer-Dixon T, Janzwood S, Rockstöm J, Renn O, Donges JF. Global polycrisis: the causal mechanisms of crisis entanglement. Global Sustainability. 2024;7:e6. doi:10.1017/sus.2024.1.

Meadows D H et al., (1972). The Limits to Growth: A Report for the Club of Rome's Project on the Predicament of Mankind (New York: Universe Books).

Nießner, S., Rosén, A. (2025). "Don't Listen to Students' Voices: Give Them Power to Transform!". European Journal of Engineering Education. DOI: 10.1080/03043797.2025.2513431.

Richardson K, et al. (2023). Earth beyond six of nine planetary boundaries. Sci. Adv.9, eadh2458.DOI:10.1126/sciadv.adh2458

Rosén, A., et al. (2022). Transformation-Driving Education: Perspectives Emerging in a Dialogue between Teachers with Experiences from Challenge-Driven Education. Proceedings of 2022 IEEE Frontiers in Education Conference (FIE), Uppsala, Sweden.

Sterling S. (2011). Transformative Learning and Sustainability: Sketching the Conceptual Ground. Learning and Teaching in Higher Education 5 (11): 17–33.

UN (2015). Transforming Our World: the 2030 Agenda for Sustainable Development, UN Resolution A/RES/70/1.

UNESCO (2018). Issues and trends in Education for Sustainable Development. A. Leicht, J. Heiss and W. J. Byun (eds). ISBN 978-92-3-100244-1.

Weyrauch, T., & Herstatt, C. (2017). What is frugal innovation? Three defining criteria. *Journal of frugal innovation*, *2*, 1-17.