Journal of Social Innovation & Transformative Entrepreneurship Education (SITE)
Year 2, Issue 1, 2026

Bricks of Transformation: A Future-Oriented Pedagogical Approach to Systems Thinking with LEGO® SERIOUS PLAY®

Authors

Maria Mair, Researcher, Technische Hochschule Ingolstadt, Germany
0009-0005-4692-8159

Laura Bechthold, Professor for Technology Assessment and Cultural Management, Technische Hochschule Ingolstadt, Germany 0000-0001-8093-5559

The article is peer-reviewed and part of the Special Issue of SITE: Future-oriented pedagogies in practice: Innovation and agency

Published April 2026

Abstract

Addressing contemporary wicked problems demands to equip higher education students with robust systems thinking and an understanding of transition processes in socio-technical systems. However, teaching such complex dynamics often creates cognitive overload within traditional linear pedagogical models. This article introduces an innovative educational workshop designed to bridge this gap by teaching Geels's Multi-Level Perspective (MLP) by using the LEGO® SERIOUS PLAY® (LSP) method. The MLP frames systemic change as the interplay between macro-level landscape developments, the meso-level regime, and micro-level niche innovations. By utilizing the tactile and metaphorical affordances of LSP, the workshop allows

interdisciplinary students to physically model these abstract interactions. The intervention focuses on the transformation of the higher education system, enabling learners to visualize tensions, path dependencies, and windows of opportunity in a tangible format. Qualitative feedback by students indicates that materializing theoretical concepts significantly enhances conceptual grasp and engagement, fostering critical reflection and collaborative meaning-making. We conclude by providing a detailed activity flow and pedagogical guidelines, demonstrating how embodied learning can effectively prepare students to navigate the ambiguity of modern societal challenges.

Key Words

Systems Thinking, socio-technical transitions, LEGO® SERIOUS PLAY®, Embodied Learning

1. Introduction

Contemporary wicked problems, such as climate change, biodiversity loss or societal inequalities, defy the analytical capabilities of industrial modernity and reveal the entrenched nature of dominant socio-technical systems (Rittel & Webber, 1973; Ferraro, Etzion, & Gehmann, 2015). Because these challenges are characterized by complexity, interdependence and conflicting stakeholder values, they cannot be resolved through the reductionist logic that originally engineered them. Further, taming those problems requires holistic societal shifts that lie beyond the reach of isolated individuals, organizations or nations (George et al., 2016). Addressing these phenomena hence demands a departure from siloed disciplinary learning toward future-oriented pedagogies that equip students with both the necessary skills as well as the agency to navigate ambiguity, complexity, and uncertainty (e.g., OECD, 2019). Foundational to this is to understand the interconnectedness, dynamics and tensions between different actors of socio-technical systems (Davis et al., 2025). However, teaching systemic approaches often generates cognitive overload for learners as they challenge the linear models that are still common in conventional education.

To bridge this gap, we developed an educational workshop based on the LEGO® SERIOUS PLAY® (LSP) method. It utilizes the tactile and metaphorical affordances of LSP to introduce systems thinking in an accessible, playful, and embodied manner to an interdisciplinary group of students. The primary learning goal of the workshop is to facilitate the understanding of Geels' multi-level perspective (MLP) on transitions of socio-technical systems (Geels, 2002a, 2002b, 2004). By exploring the interconnectedness and modeling tensions between different levels of socio-technical systems, participants gain tangible insights into the dynamics of transformation processes. Through the construction, narration, and reflection of shared models, the workshop creates a collaborative environment that enhances critical competencies, including reflective thinking, problem-solving, and ideation. Further, the use of storytelling and metaphors enhances engagement and fosters creativity in a collaborative learning environment.

2. Theoretical background and underlying models and pedagogies

2.1. Sociotechnical Transitions and the Multi-Level Perspective

Our format is grounded in Geels's theory of socio-technical transitions and the related MLP (Geels, 2002a, 2002b, 2004). As a heuristic framework, the MLP has become a central concept in

transition studies and offers a structured way to analyze how large-scale societal systems or industries change over time (Markard, Raven, & Truffer, 2012). Being grounded in systems thinking, the MLP does not attribute transformation processes to single occurrences such as technological innovations, policy decisions or entrepreneurs, but describes them as the emergent outcome of interactions between multiple types of actors, institutions, infrastructures, and cultural meaning across different levels of society. This makes it a particularly relevant perspective for understanding contemporary grand challenges or so-called "wicked problems", which are characterized by long-term path dependencies, lock-ins, and resistance to change in incumbent systems.

Geels's framework explains the dynamics of system innovations through a nested hierarchy comprising three levels (Figure 1):

1) **The sociotechnical regime** (meso-level) is the locus of established practices and institutional stability. It represents the dominant configuration of technologies, infrastructures, policies, culture, and markets that fulfill societal functions.

2) **Landscape developments** (macro-level) represent the wider, exogenous environment that influences the regime but is difficult for individual actors to change in the short term. It encompasses overarching structural trends such as demographics, macro-economic patterns, cultural shifts, and the climate crisis. The landscape acts as a gradient, exerting pressure on the existing regime and creating the necessary conditions for destabilization.

3) **Niches** (micro-level) are emerging spaces for experimentation and innovation where novel ideas are developed that eventually disrupt and transform the existing regime.

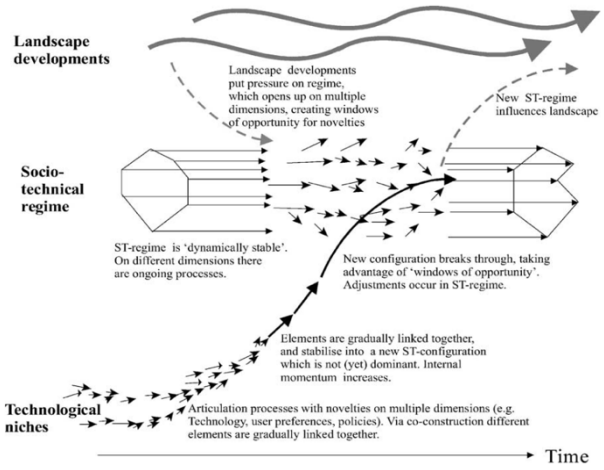

Figure 1: Geels's MLP comprising landscape developments, the incumbent sociotechnical regime, and competing niche innovations (Geels 2002b, p. 110)

The core insight of Geels's theory is that systemic change does neither happen through top-down forces nor through bottom-up drivers alone. Rather, a transition occurs only when developments align across all levels: *Pressure* from the landscape destabilizes the incumbent regime; *tensions*

within the regime create cracks or "windows of opportunity;" the *maturity* of niche innovations allows them to break through and eventually reconfigure or replace the established system (Geels & Schot, 2007).

Hence, this perspective inherently requires and cultivates systems thinking. For pedagogical purposes, the MLP is particularly valuable because it offers a theoretically robust yet intuitively graspable abstraction of complex transformation processes. It translates the messy reality of socio-technical change into a set of analytically distinguishable levels and relations that can be modeled, discussed, and critically reflected upon. It invites learners to move beyond linear cause-and-effect models and instead consider non-linear dynamics, feedback loops, and co-evolutionary processes. By modeling these dynamics with LEGO® SERIOUS PLAY®, participants move from abstract theoretical comprehension to a tactile understanding of how resistance, alignment, and breakthrough operate in the real world.

2.2. The LEGO® SERIOUS PLAY® method

The LEGO® SERIOUS PLAY® method is an open-source, community-based approach developed by the LEGO Group to support creative thinking, problem-solving, and collaborative meaning-making through the use of metaphor and physical construction (LEGO Group, 2010). This method enables learners to transform abstract ideas into tangible representations, making mental models visible and accessible for discussion. A core principle of LSP is equal participation: every participant builds, shares, and contributes their perspective, ensuring that each voice is heard and fostering a strong sense of agency within the learning process. This inclusive and kinesthetic mode of engagement has been shown to activate both cognitive and affective dimensions of learning (Medupin et al., 2025). The method also combines intentionality with playfulness, a productive tension described as the “serious play paradox”, which encourages creative expression while maintaining a clear instructional focus (Schulz & Geithner, 2013). Within higher education, LEGO® SERIOUS PLAY® has been recognized as a powerful tool for promoting reflective practice (Peabody & Noyes, 2017), an essential component of the learning process. Reflection transforms experience into knowledge by fostering insight and deep learning and is therefore a fundamental component of entrepreneurship education (Neck & Greene, 2011).

3. Description of the activity

The pedagogical motivation for this workshop stems from the authors’ observation that the abstract logic of sociotechnical transitions and the MLP is difficult to internalize, particularly for students from fields outside the social sciences who are often not familiar with the domain-specific terminology. Hence, this workshop was particularly designed for interdisciplinary groups and to bridge the gap between abstract theory and application by providing a hands-on, experiential learning format that complements theoretical input-sessions.

The presented activity has been implemented as a module in the course *Transformation Processes and Change Management* within the non-consecutive Master’s program *Global Foresight and Technology Management* at a German university of applied sciences. Scheduled mid-term (week 5) of the first semester, the workshop addresses the new cohort of students. The students come

from various, mainly technical academic backgrounds, and are often not yet used to interdisciplinary collaboration. At the point of the workshop, they have completed three introductory sessions: One on systems thinking, one on wicked problems and one on the multi-level perspective. Hence, they possess the foundational vocabulary and a basic understanding of the theory.

As an exemplary topic for discussion in this workshop, we chose to discuss the current higher education system in Germany. We selected this context because every participant, by virtue of being a student, possesses immediate, lived experience of the system. This shared familiarity lowers the barrier to entry, allowing the group to focus on applying the complex MLP framework rather than struggling to understand the domain content. Some pictures of the intervention and outcomes are presented in appendix. In the following overview the session flow and structure with its time specifications and goals are outlined:

Table 1: Workshop Agenda

Time	Phase, Description, Goal
10 min	**Phase 1 – Recap to the MLP** • **Description:** The educator recaps the MLP through a short lecture and visual explanation of key components: landscape, regime, niches, and their dynamic interactions. • **Goal:** Establish a shared conceptual foundation and ensure that students understand the analytical categories they will later model with LEGO® SERIOUS PLAY®
60 min	**Phase 2 - LEGO® SERIOUS PLAY® warm-up** • **Description:** Students engage in three consecutive short individual building tasks that introduce the LEGO® SERIOUS PLAY® method, familiarize them with its core process, and activate metaphor-based model building and storytelling. • **Goal:** Enable students to externalize ideas, articulate assumptions, and become comfortable using material representations for analytical discussion
45 min	**Phase 3 – Building the regime (individual + shared model)** • **Description:** Students first build individual models representing assigned regime components (e.g., policy, culture, technology, market and user needs). They then jointly assemble these models into a shared representation of the regime. Throughout this process, they negotiate meaning, identify similarities and contrasts, and co-create a systemic understanding of the regime. • **Goal:** Translate abstract regime components into tangible representations and support collaborative analysis of socio-technical configurations
45 min	**Phase 4 – Landscape pressures and niche innovations** • **Description:** Students build models representing landscape pressures (e.g., demographic shifts, digitalization, geopolitical changes) and niche innovations with transformative potential (e.g., AI-based learning tools, virtual reality classrooms, student-run makerspaces). They position these models around the shared regime model and discuss how external pressures and emerging niches may destabilize or redirect the regime. • **Goal:** Visualize contextual forces and innovation dynamics, identify possible entry points for change, and explore transition pathways
15 min	**Phase 5 – Group presentations** • **Description:** Groups present their complete model constellation and articulate how regime, landscape and niche elements interact. • **Goal:** Consolidate conceptual understanding and deepen interpretation through collective meaning-making
15 min	**Phase 6 – Collective debrief** • **Description:** The educator guides a reflective discussion on how the modelling process supported learning, how the MLP became experientially accessible, and how students perceive their agency within transformation processes. • **Goal:** Connect the experiential activity to theoretical insights

4. Learners' reflections

We accompanied the first iterations of the workshop with a post-survey to learn about the leaners' experiences and insights. Over multiple iterations of the workshop, students consistently reported that the hands-on and playful nature of LEGO® SERIOUS PLAY® supported their understanding

of complex theoretical concepts. The qualitative feedback indicated that materializing abstract ideas helped them grasp the structure and dynamics of socio-technical systems more intuitively. By constructing the individual levels and linking them, they reported an enhanced understanding of complex topics. One participant emphasized this impact, stating that the most important thing learnt, was "*bringing the theoretical concept into reality. With this representation, it's easy to brainstorm and find loopholes in the system.*"

Students also highlighted the engaging qualities of the method. Several described LEGO® SERIOUS PLAY® as a motivating and interactive alternative to traditional learning formats, with one student stating that "*the use of LEGO is definitely 'hard fun' and an interactive way of engaging in the topic,*" while another reflected on having been "*skeptical at first but amazed how it turned out.*" Beyond conceptual understanding and engagement, several comments emphasized the interpersonal and collaborative dimension of the workshop. Learners reported that working with peers broadened their perspectives and helped them make sense of system dynamics collectively. As one student captured: *"The different perspectives from different people help you get on track."*

5. Educators' reflection

Implementing this pedagogical approach requires careful consideration of several logistical and methodological factors. While the format adds a valuable visual and material dimension to the learning experience, it should be deployed strategically and not overused within a single course curriculum. From a logistical perspective, ensuring sufficient material availability is paramount; while pre-designed LEGO® SERIOUS PLAY® (LSP) kits are highly effective, a curated mix of regular LEGO® and DUPLO® bricks can also serve the purpose well. Furthermore, educators must prioritize rigorous time management, as the iterative phases of building, sharing, and reflection invariably require more time than initially anticipated.

The success of the workshop relies heavily on the competence of the facilitator. Lecturers must shift from a traditional "teacher" to a "process guide," where the educator resists the urge to evaluate or interpret the students' models. Consequently, it is crucial that the facilitator is trained to guide individual and group reflections effectively. In some instances, engaging an external facilitator can be beneficial to maintain a clear distinction of roles.

Regarding the pedagogical process, the formulation of prompts is critical; clear, well-scoped questions shape the quality of the models, whereas poorly framed prompts often lead to superficial builds. Additionally, because some students may initially struggle with the playful nature of the method, dedicated warm-up exercises are essential to bring all participants into a "flow" state. Finally, group size significantly impacts the dynamic. The ideal ratio is approximately 12 participants per facilitator and around 6 students per group. While a single facilitator can manage two such groups, larger cohorts require additional support. To address this, a "train-the-trainer" model has proven effective, allowing students who participated in previous semesters to return and co-facilitate, thereby deepening their own systemic understanding.

References

Benett, N., and J. Lemoine. 2014. "What VUCA Really Means for You." *Harvard Business Review.* 92 (1): 2.

Davis, M. C., Hughes, H. P. N., Robinson, M. A., Scales, J., Sankaran, S., Liu, D., … Gritt, E. (2025). Leveraging socio-technical systems to tackle grand challenges: Reflections on human-robot teams, hybrid workplaces, med-tech, and digital transformation. *Ergonomics*, 1–16. https://doi.org/10.1080/00140139.2025.2519873

Ferraro, F., Etzion, D. and Gehman, J. (2015). Tackling grand challenges pragmatically: robust action revisited. *Organization Studies*, 36, 363–90.

Geels, F. W. (2002a). Technological transitions as evolutionary reconfiguration processes: A multi-level perspective and a case-study. *Research Policy*, *31*(8–9), 1257–1274. https://doi.org/10.1016/S0048-7333(02)00062-8

Geels, F. W. (2002b). *Understanding the dynamics of technological transitions. A co-evolutionary and socio-technical analysis*. Twente University Press.

Geels, F. W. (2004). From sectoral systems of innovation to socio-technical systems. *Research Policy*, *33*(6–7), 897–920. https://doi.org/10.1016/j.respol.2004.01.015

Geels, F. W., & Schot, J. (2007). Typology of sociotechnical transition pathways. *Research Policy*, *36*(3), 399–417. https://doi.org/10.1016/j.respol.2007.01.003

George, G., J., Howard-Grenville, Joshi, A, & Tihanyi, I. (2016). Understanding and tackling societal Grand challenges through Management Research. Academy of Management Journal 59 (6): 1880–1895. doi:10.5465/amj.2016.4007

LEGO Group. (2010). *Open-source/ <Introduction to LEGO® SERIOUS PLAY®>*. https://www.lego.com/cdn/cs/set/assets/blt8ec1d6ff766ddfd4/LEGO_SERIOUS_PLAY_OpenSource_14mb.pdf

Markard, J., Raven, R., & Truffer, B. (2012). Sustainability transitions: An emerging field of research and its prospects. *Research Policy*, 41(6), 955–967. https://doi.org/10.1016/j.respol.2012.02.013

Medupin, C., Regalado, C., & Burrows, M. (2025). Creating an Innovative Approach to Engagement, Connectivity, and Problem-Solving in Higher Education Institutions Using LEGO® Serious Play®. *Education Sciences*, *15*(6), 663. https://doi.org/10.3390/educsci15060663

Neck, H. M., & Greene, P. G. (2011). Entrepreneurship Education: Known Worlds and New Frontiers. *Journal of Small Business Management*, *49*(1), 55–70. https://doi.org/10.1111/j.1540-627X.2010.00314.x

OECD. (2019). Transformative Competencies for 2030. OECD Future of Education and Skills 2030. https://www.oecd.org/content/dam/oecd/en/about/projects/edu/education-2040/concept-notes/Transformative_Competencies_for_2030_concept_note.pdf

Peabody, M. A., & Noyes, S. (2017). Reflective boot camp: Adapting LEGO® SERIOUS PLAY® in higher education. *Reflective Practice*, *18*(2), 232–243. https://doi.org/10.1080/14623943.2016.1268117

Rittel, H. W. and Webber, M. M. (1973). Dilemmas in a general theory of planning. *Policy Sciences*, 4, 155–69

Schulz, K.-P., & Geithner, S. (2013). Creative tools for collective creativity: The serious play method using Lego bricks. In *Learning and Collective Creativity* (pp. 179–197). Routledge.

Appendix: Pictures of the workshop

Different examples of metaphorical modeling of the higher education system using LEGO® SERIOUS PLAY®. The large baseplates depict the co-created socio-technical regime, representing the established actors and institutional stability (figures A1 and A2). The smaller plates (shown in figure A3) symbolize landscape pressure and emerging niche innovations. In the final stage, these elements are positioned around the shared regime model to visualize how external forces and internal innovations interact to potentially destabilize or redirect the system (figure A4).

Figure A1

Figure A2

Figure A3

Figure A4