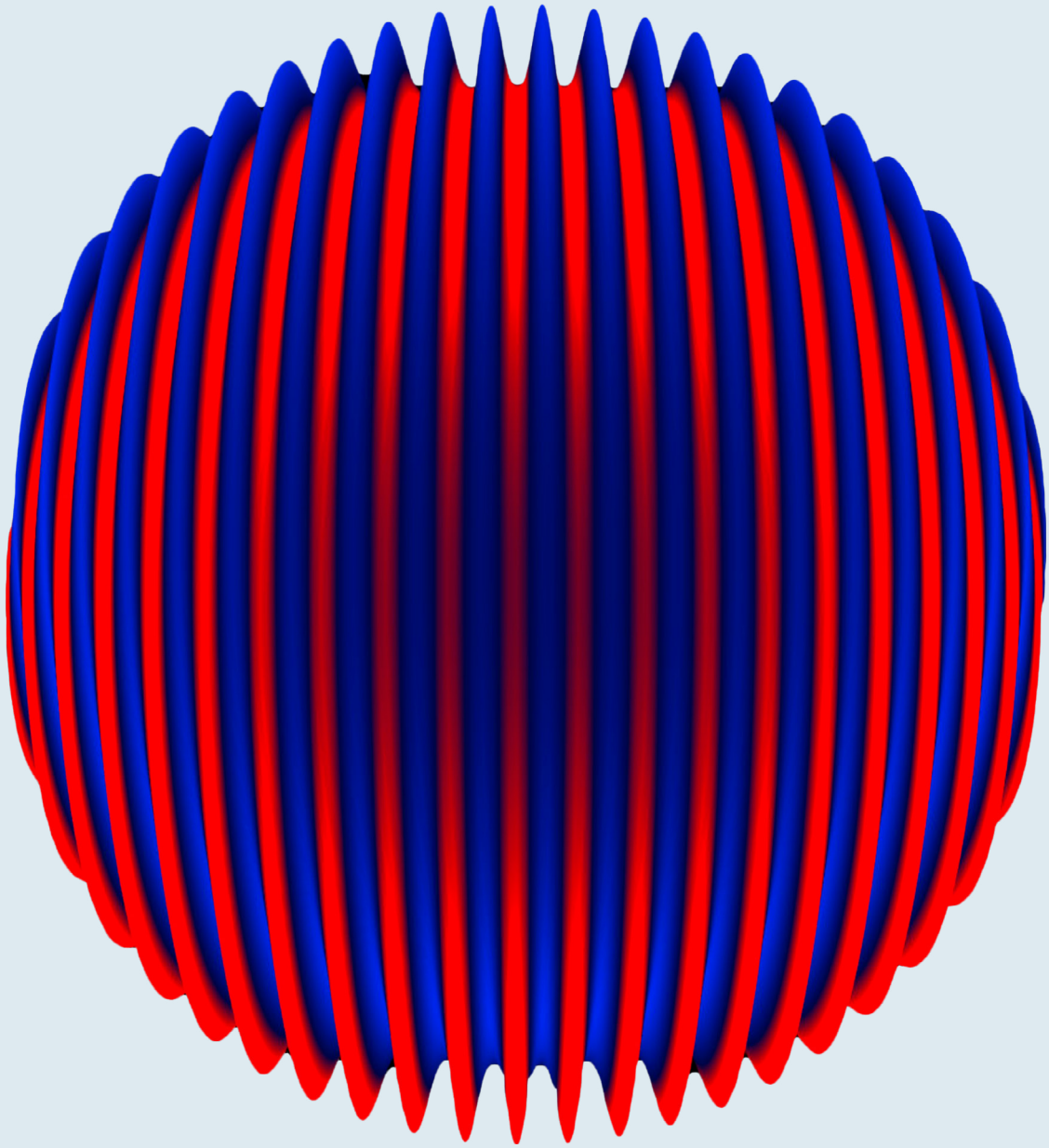

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Re-Thinking Design Thinking: Community of Practice in Design Education

Sheng-Hung Lee[1, 2]

Abstract

As Design Thinking (DT) has diffused across disciplines, it has increasingly been standardized as a transferable, tool-driven problem-solving method, often detached from situated practice and socio-technical complexity. This paper advances DT theory and pedagogy by reframing DT in response to the societal shift from an aging society to a longevity society and the economic transition from experience-centered to transformation-oriented economies. Drawing on a pedagogical case from the Urban Technology (UT) program at the University of Michigan, the study reconceptualizes DT as a situated, relational, and practice-based mode of learning, grounded in the concept of Community of Practice (CoP). Through studio-based learning, design ethnography, service design, and systems-oriented inquiry, the UT curriculum demonstrates how DT can move beyond linear problem-solving toward problem framing, collective sense-making, and legitimate peripheral participation within real urban contexts. By embedding DT within CoP, the paper extends DT beyond a design method toward an evolving form of participation influenced by shared practices, collective values, and ethical responsibility. Thus, it can position DT as a pedagogical infrastructure capable of supporting longevity-oriented, transformation-focused design education and cultivating reflective, responsible designers working within complex societal systems.

Keywords

Design Thinking, Community of Practice, Urban Technology Education

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1. Design Education for Complexity and Transformation

> *"How can we design for survival — and also survive through design?"*
>
> — Victor Papanek, *Design for the Real World* (1971, p. 322)

Design education today operates amid rising complexity across individual, community, and systemic scales. Rapid advances in artificial intelligence (AI), immersive technologies, and data-driven decision-making intersect with demographic change, climate pressures, and shifting social infrastructures (Lee et al. 2023). These forces signal a transition from experience-centered economies toward transformation-oriented models of value creation, where meaning, well-being, and long-term life fulfillment outweigh ownership (Pine and Gilmore 2020).

Building on this innovative and disruptive shift, social scholar and author Joseph Pine (2026) conceptualizes the transformation economy as a move beyond staging memorable experiences toward the intentional design of enduring personal and societal change. In this economic logic, the value of design, design organizations, and even designers emerge through sustained and meaningful support for changes in individuals' capabilities, behaviors, identities, and well-being over time, positioning users not as passive consumers of products, services, and experiences, but as active participants in becoming.

Demographic change further reshapes this landscape. Attention is moving from an aging society—often framed in terms of decline and dependency—toward a longevity society (Scott 2021; Coughlin 2017) that emphasizes extended life courses, multi-generational participation, and age-inclusive systems. Figure 1 synthesizes these shifts by visualizing the tensions and trajectories among aging and longevity societies, and experience and transformation economies (Pine 2026). Collectively, these dynamics raise a central challenge for design education: how to prepare

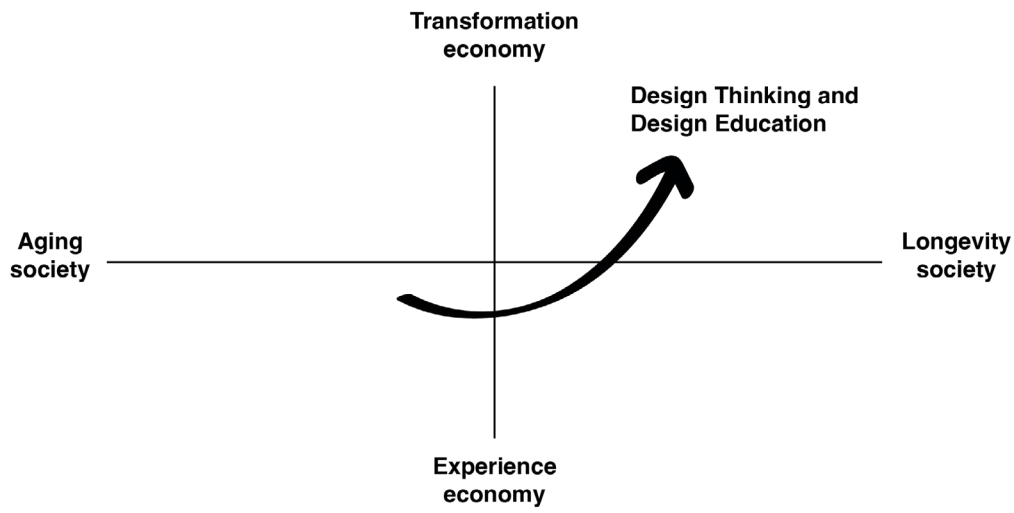

Fig. 1. Conceptual framework illustrating four intersecting tensions and trajectories: aging society, longevity society, experience economy, and transformation economy. Source: Sheng-Hung Lee

designers to embrace and engage with complexity across systems, time horizons, and life courses.

1.1. Design Thinking in Context

The term Design Thinking (DT) was first introduced by mechanical engineer and scholar John Arnold in *Creative Engineering* (1959) and is commonly framed as a structured, iterative problem-solving approach encompassing stages such as inspiration, ideation, prototyping, and implementation. Frameworks such as the UK Design Council's (2005) Double Diamond model with four phases, including discover, define, develop, and deliver, have further constructed DT as a divergent–convergent process. Early theoretical foundations can be traced to engineer and scientist Herbert Simon's *Sciences of the Artificial* (1968), which framed design as problem framing and decision-making under bounded rationality, emphasizing the construction of alternatives rather than the optimization of given problems.

Since the 1960s, DT has diffused widely across education (Wrigley and Straker 2017), business (Martin 2009), service design (Stickdorn and Schneider 2011), and systems thinking (Buchanan 2019), with its popularization strongly shaped by IDEO (Brown 2009) and Stanford d.school (McCarthy 2022). From a design research perspective, design scholar Nigel Cross (2001; 1982) conceptualizes DT as "designerly ways of knowing," grounded in abductive reasoning, synthesis, and constructive exploration, qualities that resist reduction to linear methods or toolkits.

At its core, DT is grounded in Human-Centered Design (HCD), emphasizing users' needs and experiences; more recently, psychologist and design educator Don Norman's (2024) discussion about Humanity-Centered Design (HCD+) has expanded this focus to include environmental, societal, political, and governmental consequences.

In the context of HCD+, the role of design shifts from addressing short-term problems associated with aging populations toward supporting long-term life-course systems that enable extended participation, well-being, and intergenerational engagement (Manzini 2015; Fry 2008). Design education therefore faces the challenge of preparing designers who can work across temporal horizons and complex socio-technical infrastructures rather than focusing only on immediate product or service solutions.

Within the transition from an aging society to a longevity society, DT's educational value lies in shifting designers from seeing themselves as short-term problem solvers to stewards of long-term, life-course-oriented systems (Lee 2026; Lee 2025; Lee and Sicklinger 2024). Similarly, as economies move from experience toward transformation, DT can support designers in enabling enduring personal and societal change rather than isolated experiences.

However, critical scholarship cautions that DT's abstraction into generalized, tool-driven processes risks oversimplifying complexity, obscuring power relations, and detaching design from situated practice (Kimbell 2011; Dorst 2015). These critiques resonate with anthropology scholar Lucy Suchman's (2009) theory of situated action, which challenges the assumption that complex human activity can be fully specified through predefined plans or methods, an issue that becomes especially pronounced amid demographic and societal transformation.

1.2. Community of Practice as a Pedagogical Lens

To address these limitations, this paper introduces Communities of Practice (CoP) as a complementary pedagogical lens for design education. Originally proposed by cognitive anthropologist Jean Lave and educational theorist Etienne Wenger (1991), CoP conceptualizes learning as participation in shared social practices rather than the acquisition of decontextualized knowledge. Learning unfolds through legitimate peripheral participation (Wenger 1999), as individuals gradually develop skills, identities, and responsibilities within a community until full participation. Subsequent work by Wenger further emphasizes learning as relational, evolving, and embedded within broader landscapes of practice.

This participatory view of learning aligns with social scientist Donald Schön's (1983) concept of reflective practice, in which professional knowledge emerges through reflection-in-action within uncertain, situated, and evolving contexts. From this perspective, future design education shifts from teaching DT methods toward cultivating sustained participation in ethically grounded and systemically aware practices. Within the transition from aging to longevity societies, CoP reframes designers as facilitators of inclusive, evolving communities rather than isolated experts. In parallel, as economies move from experience to transformation, CoP supports the formation of embodied, purpose-driven communities that sustain social learning, shape personal identity, and enable long-term change.

Building on Sections 1.1 and 1.2, Table 1 synthesizes these tensions and design implications across societal and economic transitions through the dual lenses of DT and CoP. This framing underpins the Urban Technology (UT) program at the University of Michigan, introduced in the following section as a pedagogical case of design education illustrating how DT can be situated, challenged, and extended through a CoP–oriented curriculum.

1.3. Research Approach

This study adopts a qualitative pedagogical case study approach to explore how DT can be reframed through CoP within design education. University of Michigan's UT program (Wizinsky and Boyer 2025) is used as an illustrative case because it integrates studio learning, ethnography, and systems-oriented design inquiry within real urban contexts. The analysis combines conceptual synthesis of design theory with reflective examination of the program's pedagogical structure, studio practices, and learning trajectories. Rather than aiming for generalizable empirical findings, the study seeks to develop theoretical insights into how DT can function, adapt, and integrate as a situated learning practice within CoP.

This conceptual paper therefore investigates the following research question: *How can Design Thinking (DT) be reframed as a practice within Communities of Practice (CoP) to support design education in contexts of societal and economic transformation?*

2. Case Study: Urban Technology

The study uses the University of Michigan's UT program as a pedagogical case to explore the initial research question, how DT can be adapted and integrated with CoP to prepare designers to engage with complexity across systems, time horizons, and life courses.

2.1. Urban Technology as a Pedagogical Context

Established in 2020 as an undergraduate major, the UT program addresses the growing intersection of urbanism, technology, and design through a studio-informed, practice-based educational model (Clayton et al. 2025; Wizinsky and Boyer 2025). The curriculum integrates design studios, ethnographic methods, prototyping, and systems-oriented inquiry to prepare students for complex urban challenges spanning social, technical, and institutional domains (Nicholson 2025). Rather than treating technology as an end in itself or as tools, UT positions it as a mediating layer through which urban experiences, services, and social infrastructures are shaped and transformed.

Pedagogically, UT emphasizes learning through doing (e.g., DT stages of prototyping and implementation, consid-

Tensions	**Aging → Longevity**	**Experience → Transformation**
DT	DT shifts designers from problem solvers to stewards of long-term, life-course-oriented systems	DT moves beyond experience creation toward designing for enduring personal and societal transformation
CoP	CoP positions designers as facilitators of inclusive, evolving communities rather than isolated experts	CoP activates embodied, purpose-driven communities that sustain learning, identity, and change over time

Table 1. Tensions and design implications across societal and economic transitions, contrasting aging and longevity societies with experience and transformation economies through the lenses of DT- and CoP

ering designers as problem solvers), observing, and reflecting within real or realistic urban contexts. Design students engage in team-based studios (e.g., CoP's cultivating communities, considering designers as facilitators), fieldwork, and iterative critique, gradually developing fluency across design, computation, and urban systems.

This new structure foregrounds problem framing, stakeholder engagement, and ethical awareness alongside technical skills, positioning design education not merely as skill acquisition but as participation in evolving practices of urban innovation. As such, UT provides a productive context for examining how design education can respond to systemic complexity, longevity-oriented societal shifts, and the limitations of method- and human-centered approaches.

2.2. Connecting Design Thinking and Community of Practice

The UT program offers an alternative lens for exploring and examining the relationship between DT and CoP in design education. While DT provides accessible frameworks for human-centered problem-solving, its application in UT is deliberately situated within shared practices, social contexts, and extended learning trajectories. DT tools, such as user research, ideation, and prototyping, are embedded within studio cultures, collaborative inquiry, and sustained engagement with urban stakeholders, rather than treated as standalone methods.

Viewed through a CoP lens, learning in UT unfolds through participation in collective practices rather than the mastery of abstract techniques. Design students begin as legitimate peripheral participants (LPP)—newcomers or junior designers who learn by taking part in a community's real practices in low-risk, supportive ways before moving toward fuller participation (Lave and Étienne Wenger 1991)—gradually assuming greater responsibility as they develop shared repertoires of DT methods, language, and design judgment.

The vision and design of the UT program function not only as an educational example but also as an analytical lens through which the relationship between DT and CoP can be explored. In this context, DT methods such as ethnography, design ideation, and rapid prototyping are not taught as isolated tools but operate as shared repertoires within the community. Students progressively move from LPP toward deeper engagement through studio collaboration, stakeholder interaction, and iterative reflection. This trajectory can also possibly help cultivate creative empathy (Owens 2024)—the art and practice of engaging with a team's perspectives and actions to develop thoughtful, collectively owned design solutions.

Figure 2 visualizes the concept of LPP within a CoP and uses it to link DT to the design and development of UT pedagogy. Design education can be understood as a learning trajectory into a CoP. Newcomers, junior designers, or design students typically begin at the periphery of the CoP. Over time, through sustained engagement and interaction with design communities, including design academics, practitioners, the broader socioeconomic environment, and even policies, their learning trajectories gradually shift from peripheral involvement toward full participation at the center of the CoP. These trajectories are not uniform; they vary according to individuals' backgrounds, conditions, resources,

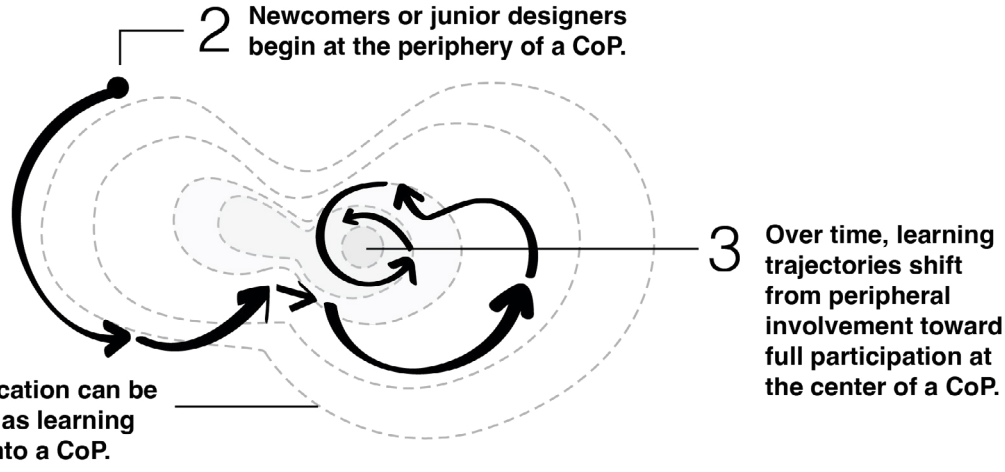

Fig. 2. The visualizing concept of legitimate peripheral participation (LPP) from Communities of Practice (CoP) is used to link Design Thinking (DT) with urban technology pedagogy. Source: The visual is adapted from Wenger's presentation *Learning in Landscapes of Practice: Recent Developments in Social Learning Theory* (Festival of Research, Brighton Fringe, May 1, 2013)

and prior experiences that entangle with design communities. In this context, DT can be defined as segments along each learning trajectory (represented by arrows), serving as connective moments or "glue" that together compose a designer's evolving path of participation.

This perspective reframes DT from a generalized innovation process into a situated mode of collective sense-making shaped by community norms and cultures, ethical and inclusive considerations, and systemic and complex constraints. Integrating DT within a CoP–oriented pedagogy thus extends its role beyond problem-solving, positioning it as a relational, evolving, and meaningful practice. This connection illustrates how design education can move from method-driven instruction toward cultivating reflective practitioners capable of navigating complexity over time across the tensions of aging and longevity societies and experience and transformation economies. Table 2 summarizes the analytical comparison of DT, CoP, and UT pedagogy.

3. Conclusion and Discussion

The conclusion reflects on the preliminary study's contributions to Design Thinking (DT) and advances a vision for future design education.

3.1. Contribution to Design Thinking

Building on foundational work by Simon (1968), Schön (1983), and Cross (2001), this preliminary study reframes DT not as a universal method but as a situated practice emerging through participation, reflection, and collective sense-making. Contributing to ongoing debates on Design [Re]Thinking, the paper shifts DT from a generalized, tool-driven problem-solving approach toward a relational and practice-based mode of learning. Drawing on the Urban Technology (UT) program as a pedagogical case, the study shows how DT gains explanatory and educational value when embedded within a Community of Practice (CoP). Rather than a transferable sequence of stages, DT is understood through legitimate peripheral participation (LPP), collective sense-making, and ethical engagement in real urban contexts and everyday life.

This reframing resonates with longstanding critiques of linear design models. Architect and design scholar Peter Rowe (1994) characterizes design as heuristic reasoning, in which the effectiveness of a chosen path cannot be known in advance. Similarly, design researcher and theorist John Chris Jones's (1974) model of divergence, transformation, and convergence emphasizes the transformative phase as one of pattern-making, insight, and creative reconfiguration. Through a CoP lens, transformation becomes a collective, situated process rather than an individual cognitive act.

Building on these perspectives, the study extends DT in three ways. First, it regrounds DT in situated practice, emphasizing participation over procedural mastery. Second, it shifts DT from problem-solving toward problem framing and ongoing sense-making, better reflecting the ambiguity and complexity of urban and longevity-oriented challenges. Third, it repositions DT as an ethical and relational practice, attentive to long-term societal consequences rather than short-term innovation outcomes. Together, these contributions position DT not as a universal method, but as an evolving practice shaped by communities, collective values, and complex systems over time.

3.2. Future Design Education

Designer and educator Victor Papanek's (1971, p.285) vision of design education emphasizes not only skill acquisition, but the cultivation of creative capacity, theoretical understanding, and a philosophy of life grounded in social and ecological responsibility. His notion of "total design" or "integrated design" frames design as an ethological and ecological practice extending across platforms, processes, and places.

Building on this vision, the study suggests that future design education needs to move beyond method-centric instruction toward the intentional design of learning environments as CoPs (Lave and Étienne Wenger 1991). As societies transition from aging to longevity and from experience to transformation economies, designers will increasingly operate across extended periods, diverse stakeholder groups, and interconnected socio-technical systems. Preparing designers for these conditions requires pedagogies

Concept	**DT**	**CoP**	**UT Pedagogy**
Learning mode	Method-driven	Participation-driven	Studio collaboration
Knowledge	Tools and stages	Shared practice	Ethnography + systems
Designer role	Problem solver	Community participant	Facilitator

Table 2. Analytical comparison of Design Thinking (DT), Communities of Practice (CoP), and Urban Technology (UT) pedagogy

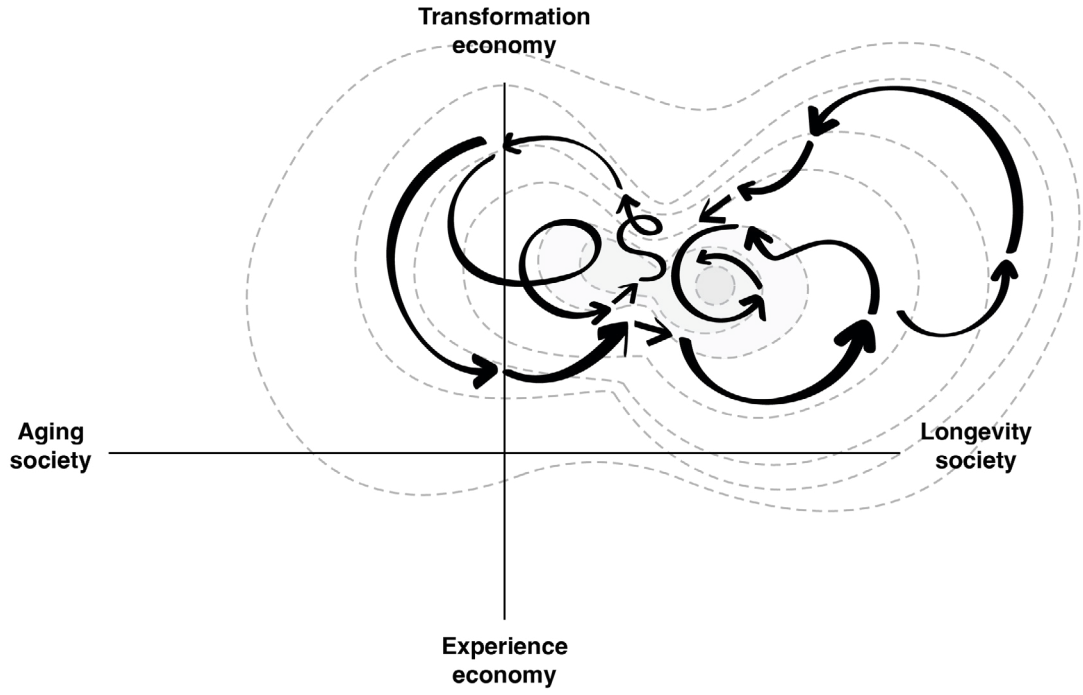

Fig. 3. Envisioning future learning trajectories in design education as entry into a CoP. Source: Sheng-Hung Lee

that support sustained participation, identity formation, and ethical responsibility, and that reframe design education as a learning trajectory into a CoP (Figure 3).

The UT case illustrates how studio-based learning, ethnography, and systems inquiry can function as social infrastructures for cultivating reflective designers embedded within evolving urban practices. Future design education should therefore prioritize learning with communities rather than designing for users, emphasizing facilitation, relational skills, and long-term engagement. By integrating DT within CoP–oriented curricula, design education can better equip designers to navigate complexity, uncertainty, and societal transformation, positioning design not only as a mode of innovation, but as a long-term civic and ethical practice.

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