

Beyond Interdisciplinarity: A Critical Reconstruction and Relevance Reflection

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Abstract

Before its official publication, Julie Thompson Klein's book *Beyond Interdisciplinarity: Boundary Work, Communication, and Collaboration* (2021) received an assessment (Pohl et al. 2019) that, to this day, seems to have prematurely established the work's place among ITD scholars. This paper argues that this reception reflects a systematic under-reading of the work's conceptual ambition. Drawing on Kinchy and Kleinman's (2003) distinction between strategic and routine boundary work, it proposes that Klein's framework has been interpreted primarily through a 'strategic' lens- which is more focused on specific projects- but that its deeper and more generative contribution is in a 'routine' one, which is concerned with reconceptualizing the institutional conditions of knowledge production altogether. This distinction is further developed by drawing on Klein's own earlier work on simple and complex models of education and is illustrated through an extended reading of Winter's (1996) work on knowledge ecologies. To do this, the paper begins with a critical reconstruction of each chapter of Klein's text and then moves to a critical analysis which elaborates on these two different interpretations by developing a distinction between simple and complex boundaries. Additionally, this paper also includes a relevance reflection informed by Sigl and Fochler's (2025) notion of 'doing relevance', situating the paper within the author's own development as an early career researcher. The paper ultimately calls for a more 'routine' engagement with what seems to be a conceptually powerful, if underutilized, basis for thinking about how academic institutions might be reconstituted as ecologies of knowledge production rather than territories of disciplinary demarcation.

Introduction

The call for abstracts for an upcoming ITD Alliance conference opens with the theme of 'enhancing theoretical foundations of ITD'. The move towards conceptual frameworks might at first appear unexpected for this particular group of researchers who, more aligned with the so-called Zurich school of ITD, tend to focus on the pragmatics of problem solving (Scholz, 2015). Indeed, there is often a sense that in this branch of ITD work, participating in definitional debates runs the risk of diverting the already limited capacities of ITD researchers away from more concentrated problem-solving efforts (Bammer, 2013).

However, it seems as though the rising conceptual challenges for ITD are of a qualitatively different character than the conceptual debates that preceded them (Rigolot, 2020). In the past, many of these conceptual debates were in large part, although not entirely, centered around ‘what ITD is’. One branch placed the emphasis on a more unified theory to frame knowledge production (Nicolescu, 2001), while another, mode 2 group focused primarily on stakeholder engagement and collective problem-solving (Scholz and Steiner, 2015). In some respects, the theoretical debates were about *the role of theory itself*, with a Nicolescu school, or mode 1 emphasis, placing it as central; and a Zurich school, which held a mode 2 emphasis, appreciating theory for its ability to illuminate context.

Today, however, it is increasingly realized that a meaningful integration of ITD within universities requires, beyond mere projectification (Felt, 2013), a deeper and more substantial reckoning of the institutional context in which it finds itself. This presents a different set of challenges, both conceptual and practical, for those who wish to engage in ITD work. These challenges range from funding regimes which prioritize disciplinary aspirations and framings from the very start of projects (Vasbinder et al. 2010) to evaluation metrics which prioritize disciplinary outcomes and ‘quantity’ over ‘quality’ towards the end of projects (Kaiser and Gluckman, 2025); taken together, the very life-cycle of an open-ended research process, which ITD takes as its core aim (Lang et al, 2012), is forestalled.

The conceptual challenge, then, is not one of defining what inter- or transdisciplinarity means, but of understanding what it means within institutional conditions that constrain certain possibilities of knowledge production (Vilsmäier, 2017). In this respect, these challenges might be broadly characterized as requiring a framework capable of “effecting ontological transformation in the objects and relations of research” (Barry et al. 2008) so that ITD research might emerge as a distinct knowledge regime on its own terms (Vienni-Baptista and Pohl, 2023).

Importantly, these tensions implicate the overall structure of the university (Barnett, 2024) and further call to mind a broader set of questions regarding the role of the university in responding to the ‘metacrisis’ (Hedlund, 2023). In short, the conceptual framing required for ITD at the moment is more along the lines of *transformative change in a time of metacrisis*, which involves a deep and critical engagement with existing institutional patterns that, by their very nature, form ‘the more robust parts of social life’ (Giddens, 1984 p. 24).

While such a conceptual challenge certainly requires several different frameworks and approaches to be applied in various contexts, this paper argues that ‘*Beyond Interdisciplinarity: Boundary work, Communication, and Collaboration*’ can provide one such promising framework. However, existing research has assessed this framework in what seems to be an unfair and incomplete light (Pohl et al., 2019). Important to note about

this assessment, though, is that the researchers had drawn on Klein's framework *before* Klein herself completed the book; which is to say that they performed this assessment "with her permission" (Pohl et al., 2019). Either way, whether Klein's engagement with the framework shifted significantly in that interval, or whether the researchers interpreted it selectively, the assessment seems to miss what is most conceptually powerful about the work. Further, given the lack of attention the book has received since, one has reason to believe that this lack of attention is in no small part related to this assessment, which was carried out by researchers whose collective work is often pivotal in shaping the overall landscape of ITD discourse.

The aim of this paper is to provide an alternative assessment of Klein's work that makes some of her core arguments clearer. To do so, I will draw on Kinchy and Kleinman's (2003) distinction of 'strategic' and 'routine' boundary work, which Klein herself points to in the book. Strategic boundary work, while useful, is boundary work that primarily serves on the level of the *project*; routine boundary work, on the other hand, is more concerned with a deeper change of routine and patterns within institutions. While Klein's framework certainly provides a more 'strategic' interpretation which Pohl et al. (2019) use in their assessment of the overall framework, a more routine interpretation is likewise implicit throughout and provides, I hope to argue, an altogether more expansive and interesting conceptual framework that centers on transforming academic institutions. In this respect, it seems particularly well suited for some of the conceptual challenges that currently lie at the heart of ITD.

Method

To achieve this aim, this paper will perform a critical reconstruction and review (Skinner, 1969) of the work. First, it will provide a summary through distilling and outlining the core arguments and themes of each chapter. When appropriate, additional comments will be included to help clarify some of the argumentative nuances that the book deals with. Unless otherwise noted, all citations that are used in the 'Summary' section can be attributed to their original placement in Klein's text rather than to the primary sources directly.

While it might seem like rote summarizing or simple rewording, the process of working through a text to reassemble key claims has been argued to be a fruitful step in grasping its core meanings (Skinner, 1969). In particular, this text has helped to clarify the heterogeneous and somewhat scattered landscape of ITD as a discourse, and engaging with Klein's presentation of this discourse additionally allows for a deep engagement with the innovative, even radical, conceptual framework that lies underneath it and which aims, as the work's title suggests, to move Beyond ITD.

The second part of this paper will explore this more implicit framework that emerges throughout the work. It will suggest, as mentioned above, that Pohl et al. (2019) have understood the framework through a more ‘strategic’ interpretation, which is certainly present in the text but does not exhaust its conceptual potential. The more interesting and conceptually useful reading, I suggest, lies in this ‘routine’ interpretation. To further clarify this distinction, this paper will draw on Klein’s previous work of simple and complex models of education (1997) to make a theoretical clarification between ‘simple’ and ‘complex’ boundaries, which roughly correspond to the two kinds of boundaries that Klein outlines early in the book.

Indeed, there is reason to believe, given its lack of critical engagement, that such reconstruction and critical analysis is perhaps required. It is for this reason that citations appearing in the summary section below, although reconstructed and written in my own words, are to be understood as attributed to Klein’s engagement with them rather than to any independent reading of the primary sources. They nonetheless appear in the works cited, both for transparency and because their presence reflects the intellectual landscape which Klein herself is navigating.

In addition to reconstructing and critically evaluating Klein’s framework, this paper introduces a relevance reflection informed by Sigl and Fochler’s (2025) notion of ‘doing relevance.’ Rather than treating relevance as some inherent property in certain kinds of knowledge, Sigl and Fochler conceptualize it as a set of practices and competencies through which researchers position themselves with respect to a larger social fabric. In this respect, this paper is done in the spirit of *practice*, particularly in the practice of *synthesis*, one of the core frames that Sigl and Fochler use to introduce doing relevance. Adopting this lens, a core aim of this paper is to examine what forms of relevance Klein’s framework might enable and to simultaneously situate these themes within my own development as an academic researcher.

Summary

Part I: Definition

Due to the heterogeneity of discourses, meanings, applications and understandings of ITD, Davie (2011) argued that there is no authoritative work to draw on to distinguish it. In a very simple sense, the book is responding to this paradox of heterogeneity: namely, that ITD is both something with a defined center and yet, at the same time, that very center is its heterogeneity.

This part of the book outlines the conceptual framework that is used to navigate this paradox. First, this chapter will outline two different boundary metaphors- one spatial, one ecological- and the following two will move into boundary discourse and interdisciplinary fields as focal points of inquiry. In these latter two chapters, these two boundary metaphors will become playfully and subtly apparent. An important move here is that Klein increasingly zooms in: first, she deals very broadly with the meaning of ‘boundary’, and then zooms into boundary discourse, and, further, to ID fields, which are shaped by boundary discourses.

Chapter 1: Boundaries

Overview

The chapter begins by noting that boundaries are everywhere; they pervade most, if not all, parts of our lives. Within this text, their sociocultural nature is emphasized; meaning boundaries help to shape the very *form* of social life, on both an imaginal and material level (Akkerman and Bakker, 2011). An important move in this chapter, which likewise runs through the rest of the book, is that there are two different ways to both imagine and enact social boundaries: one which is more ‘spatial’, and one which is more ‘ecological’.

The first one that Klein outlines are this ‘spatial’ view of boundaries, which are understood mostly in terms of turf and territory. In an image, boundaries are lines in the sand that create a demarcation of ‘here’ and ‘there’. This sort of vision is not only clear in things like geopolitical boundaries, but likewise in disciplinary departments and faculties. The metaphor is clear, for example, in epistemic trespassing. There are certain disciplines that control certain turfs and territories, and epistemic trespassing is when someone not in that territory makes claims about it.

Importantly, the university itself is a structure that both draws and enforces these boundaries. Further, these are historically contingent demarcations rooted in, among other things, epistemes (Foucault, 1995). The boundaries within a university are therefore contextually situated and historically shaped- as inflexible and absolute as they sometimes appear.

Research is explored which suggests that disciplines are not, in fact, as strict and homogenous as some of these more territorial images may seem. Disciplines grow, change, and morph into new shapes and draw different distinctions; they “subdivide and recombine, changing shape and position” (p. 37). A few examples are given, ranging from methodological to theoretical exchanges which each blur lines in their own way. In this respect, it becomes valuable to additionally view boundaries in a more ‘organic’ or

ecological sense. This view of boundaries allows for exchange, adaption, and growth opposed to something linear.

This more porous view (Dallimer and Strange 2015) views boundaries as “edges, ectones, boundary layers, gradients, climes, transition zones and interfaces” (pp. 42) In this sense, boundaries are reimagined from things that are more fixed and linear and are instead complex, changing, and evolving over time. Boundaries are not *lines*; they are porous and open-ended conditions for exchange- the way a cell wall, for example, acts less like a brick wall and more a traffic agent.

Based on this view of boundaries as organic and ecological, Klein aims to build on Winter’s (1996) call for libraries to move beyond a more territorial and spatial logic towards a more ecological form of organization. Indeed, Winter likewise seems to critically engage with this double view of boundaries. Klein, in a similar manner, wants to adopt this more ecological model of boundaries to frame cross-disciplinary and cross-sector work. In doing so, the call that the rest of this book will focus on is for ‘ecologies of spatializing practices’, which pushes to create new kinds of spaces for knowledge production within cross-disciplinary and cross-sector work.

Two images are used to illustrate what this might look like: trading zones and communities of practice. Both emphasize openness, relationality, and becoming. Trading zones are places of exchange where consensus is reached, and the emphasis is on negotiation and agreement (Holley 2017). Similarly, communities of practice go a step beyond mere negotiation and provide examples where groups with common interests build community by sharing expertise and information (Lave and Wenger, 1991). These two are not the only ways to consider ‘cross cutting’ practices but provide good models- so Klein argues.

Boundary Objects and Boundary Discourse

The previous section highlights the conceptual framing for two kinds of boundary metaphors; this distinction will be central throughout the book, even if Klein does not always make this distinction apparent. On this point, these two boundary metaphors often appear not by ‘name’ but appear in a wide-ranging litany of examples.

This section, building on this initial framing, outlines the different kinds of boundary elements that are at play in CDCSW. In doing so, the work begins to dive deeper into the question: how do people actually work across boundaries?

Boundary objects are a foundational element for understanding ‘boundary work’. The concept was proposed to account for the role that artifacts play in enabling communication and cooperation between groups despite differing values, norms, and aims (Gieryn, 1983).

There are different kinds of boundary objects: they can be concrete or abstract, visual or cerebral, and material or processual. With boundary objects, the core aim is to have common points of reference where different people and groups can have a springboard for connection, mutual understanding, translation, and more collaborative dialogue.

This brings Klein into the nature of boundary discourse, which is not directly defined, but educational neuroscience is explored in depth and presumably stands in as one such example. Importantly, some of the core concepts that would come to define the field- such as learning and knowledge- have different meanings and emphasis in both educational discourse and neuroscientific discourse. Through boundary objects and a more intentional collaboration, both educational meanings and neuroscientific meanings were able to blend and synthesize, creating a more mutually informed and rich discourse (Beauchamp, 2013).

Boundary Agents and Organizations

Similar to how boundary objects and boundary discourses share an important relationship, so do boundary agents and organizations. Boundary organizations are normally understood as organizations that have an interest in both science and policy (Gutson, 2001). This seems to be the definition that is kept, although there is reason to believe that Klein does not necessarily believe this captures the full nuance, given her resistance thus far to provide strict definitions. Indeed, this resistance is part of the paradoxical, koan-like nature of the work, and Klein often calls this the ‘boundary work of naming’ (p. 75).

Either way, both within these organizations, as well as in ITD or CDCSW initiatives more broadly, certain people tend to play important roles as “intermediaries who reach across structural holes or gaps” (Long et al. 2013). On the more individual level, the language of brokering is commonly used to describe practices of integrating and certain kinds of knowledge. Brokering is argued to be especially effective when specific agents have interests in different organizations (Lang et al. 2012).

As a final point, the topic of institutional stability and change are brought up to close the chapter. Drawing on existing research from Zietsma and Lawrence (2010), Klein outlines four cycles of institutional change: stability, conflict, innovation, and re-stabilization. Indeed, ‘boundary work’, in its variety of different forms, exists in all cycles and at stages and is implicitly interwoven throughout. We are always engaged in, as she reminds us throughout the text “processes of bounding, unbounding, and rebounding” (p.54).

Chapter 2: Discourses of boundary crossing

Overview

The chapter begins by bringing up typologies, which Klein notes, are essentially just another word for boundaries. Importantly, the typologies and categories that have classified knowledge in the West in the 20th century were largely disciplinary, until a recent shift towards its close, where it was “supplemented and challenged by cross disciplinary activities” (p. 55).

While the last chapter focused on what might be more specific examples of a boundary discourse, such as educational neuroscience, this chapter refers to the discourses that have come to define ITD itself. This is an important distinction that Klein does not name; namely, whether a boundary discourse is an *instance* (like educational neuroscience) or whether it is more general (like ITD). Indeed, there is reason to believe she means both.

Darbellay (2015) suggests that ITD can be categorized by two main discourses: a more philosophical one and a more problem solving one; Klein, like her seminal paper on ITD discourse published in 2013, adds ‘transgression’ to this list. Along with going into these various discourses, the chapter likewise aims to draw connections between them. This chapter, like the one before, operationalizes both boundary metaphors: one which views an ITD discourse as demarcated along three different themes and is thus more ‘spatial’; and one which views it as something whole and porous, whose connections are woven throughout its heterogenous form, and is thus more ecological.

Philosophy

Klein begins by noting that normally, conversations around ITD from the philosophical lense are epistemological in nature. Several historical examples abound, across different epochs, paradigms, and epistemes, many of which focus on the desire for a unification of something like absolute knowledge.

The breakthrough conference on ITD held in Nice in 1970 defined TD as ‘a common set of axioms for a set of disciplines’ (Apostel, 1972). This epistemological focus is also shared in general systems theory, which, like a common set of axioms, looks for general principles common to different kinds of systems. Despite the epistemological focus, Eric Jantsch stands out during this time as someone who is concerned about the structural conditions which produce knowledge (1972), focusing on social purpose and regeneration in universities.

The epistemological focus can sometimes lead to theories that aim to be unifying and perhaps even totalizing- such as, for example, in Nicolescu (2001). This discourse is sometimes understood as ‘mode 1’, positioned in contrast with a ‘mode 2’, which aims to be more problem-focused. The problem-solving discourse has its roots in German speaking

countries, and most notably begins in a mandate to ‘frame research around lifeworld problems instead of disciplines’ (Mittlestrauss, 1992).

In recent years, the philosophical discourse has moved beyond an epistemological to consider more ontological elements. This is evident in a 2013 publication of Barry and Born (2013), in which ontology is “elevated as one of the logics of ITD”.

Problem solving

Even though the problem-solving discourse is increasingly championed as an inherently good force, Klein points out that it has a complex history. For instance: some of the ‘problems’ that it aims to solve are problems that a military industrial complex deems as worth solving and include examples like building a nuclear bomb. This, truly, is a crucial point: collaboration is not a standalone silver bullet. It first requires a deep inquiry into the existing structural conditions and imaginaries in which it is situated; without this inquiry into its conditions, it will only reproduce much of the same.

A 2000 conference hosted by the network for transdisciplinary research was said to represent a “normative turn” in ITD, for its prioritization of real-world problems. Since then, more initiatives have emerged that prioritize cross-sector and cross disciplinary work that use this problem-solving approach, and new fields like ‘team science’ have emerged which take these initiatives as their disciplinary focus; which, as Klein notes, represents “yet another episode in the boundary work of definition” (p. 61).

An even larger definitional debate constitutes the nature of ITD, with some saying it is mostly a philosophical phenomenon, some saying it's about institutional structure, and others who argue that it is about methodology (Lury et al. 2018). Despite the lack of consensus on ‘what it is’, there is nonetheless a number of examples which Klein cites and explores which provide foundational methodologies, frameworks, tools, that provide canonical and useful for situating ITD work. A number of these resources are also listed at the back of the book. One example that sticks out is that ITD is centered on a logic of ‘abduction’ (DeMelo, 2018) which involves an intuitive way of reasoning that is generative, inquisitive, and creative.

Critique

Importantly, the discourse on critique of ITD is not only a critique of things like the positivism and bureaucracy that guides disciplinary knowledge production and the structure of these universities, but in the same token, the way that ITD itself is practiced and integrated into these structures. In that sense, the critique is twofold: it is about these pervasive institutional logics, and how ITD sometimes becomes morphed by them.

One framing that aligns with the discourse on critique is post normal science (Funtowicz and Ravetz 1993), which is a transgressive framing that calls for a deeper inquiry into how different parts of reality are interconnected. The concept of staying with the trouble also serves as a meaningful way to consider critique (Haraway, 2016), as it aims to embrace challenges and uncertainties instead of trying to rush to solve them. Indeed, looking for solutions can often reinstall the very logic which created these wicked problems. In that sense, staying with the trouble points to a different mindset and way of being, and aligns with the notion of anti-disciplinary (Pickering, 2013) which centers itself outside of disciplinary thinking and the academy altogether.

Critique is also implicitly aligned with discourses of problem-solving and philosophy, since both other discourses have emerged as from critiques of existing frameworks which have not been able to do either. It therefore represents, to some degree, a unifying discourse within ITD. All three discourses, Klein suggests, “bespeak transformative change” (p.73) but transformation remains challenging.

Bridging Discourses

Klein further touches on the theme of transformational and institutional change, and the degree to which it is not only implied in but a necessary part of integrating ITD within universities. Three kinds of political change are outlined as a guiding framework (Kahns, 1979) to connect with the existing discourses. The first, conservative elites, “prioritizes instrumental solving of social and economic problems without disrupting the status quo” (p. 66), and Klein seems to suggest that this aligns most closely with the rhetoric of ‘convergence’, which runs the risk of creating a one-size-fits all discourse without any real meaning behind it.

The second group, radical dissidents, lines up most with the discourse on critique, as it mostly positions itself with a focus on emancipation from existing decolonial structures. However, it is also connected to notions of epistemology, since it necessarily raises questions about what counts as knowledge and what kinds of knowledge can be used to solve certain problems. A number of rich examples and frameworks are presented which explore these themes, mostly in the global south.

The third group is Liberal Academics, a supposedly harmonious middle ground that wavers between these two ends. In exploring this group, a typology of different kinds of institutional change is offered, and Klein seems to be further putting pressure on the question as to whether or not this group- which, one might gather based on the name, is the one most representative of the university- is capable of dealing with the themes of institutional change. What does institutional change really entail? Different models for this change are explored,

noting shifts that are more reparative versus ones that are more transformative. This then leads to a more in-depth reflection as to what counts as TD, and where it might fit into the university.

Who's Knowledge Counts?

Building on this theme, many researchers suggest that TD is not just about new ways of doing research, but about producing new kinds of knowledge altogether, which additionally requires a more expansive and open-ended disposition as to who can provide that long-ignored knowledge. Davis (2004) suggests that although recent efforts have tried to include indigenous knowledge, this effort is more so about 'crossing a bridge' (imposing a logic) than 'bridging a gap' (creating conditions for further connection).

ITD initiatives and scholars often outline the need for this contextual knowledge, but the way this local knowledge is engaged with and integrated- to the degree that it is, at all- present significant challenges. Finding ways and strategies to bridge the gap between these two kinds of logics remains difficult, since ITD tends to occur within a logic of euro modern rationality.

It is also important to note that these local knowledges are, by definition, local and contextual. They are always different and should not be treated as one monolith of indigenous knowledge. Different regions have different ways of seeing the world (Vieni-Baptista, 2016) and a sensitivity towards these local knowledge's, which are necessarily unique and situated, is an essential step towards more meaningful collaboration.

Klein then wraps up the chapter and compares these three discourses to her 2013 paper which explores the same three discourses, but she identifies a few changes of emphasis since then. For philosophy and transcendence, it is noted that there is an increasing emphasis on 'ontology' more than just epistemology; for problem solving, more radical claims have been made by authoritative bodies to include TD approaches; and transgression is now seen as a meaningful link for both problem solving and philosophy.

Chapter 3: Interdisciplinary Fields

Overview

Moving beyond the nature of discourse and boundary discourses, and the ways that boundary discourses connect and bridge gaps or fail to do so, this chapter moves to more specific examples of ID fields. These fields include their own discourses but also their own material and institutional arrangements that help ground these discussions further.

As noted at the start of this paper, an important distinction can be made between two kinds of boundary work: *strategic* boundary work, which involves more small scale and targeted approaches, and *routine* boundary work, which involves more long-term shifts of attitudes and practice (Kinchy and Kleinman, 2003). To further illustrate this, Klein draws on research from Katz (1996) at the start of this chapter and notes that, within the political economy of the academy, new fields in academia must play existing power games for securing resources in institutional space. “Their boundary work is thus two fold: fitting into existing boundaries, and advancing new interests that do not fit into conventional categories” (p. 75).

On this point, while Pohl et al. (2019) situate their project in a strategic framework, and there is necessarily some degree of overlap with a routine one, the critique of their assessment that runs through this paper is that there is no gesture towards the routine dimension, and that this routine dimension is exceedingly important in Klein’s work. Although there is overlap, making this clear is an essential part of decoding Klein’s work.

The Nature of ID Fields

Klein briefly explores how ID fields emerge and draws on research from Miller (1982) who identified four catalysts for new fields: topics, life experiences, professional preparation, and hybrids, and “boundary consciousness appears in all four categories” (p. 76). In recent years, a study from the Social Science Research Center noted that the most popular emerging ID fields lean towards an interest in advocacy and activism. It is further expected that ID fields will continue to grow in this direction, not only due to the need for them within research, but likewise due to the interests of students to pursuit these ID fields.

Reviewing a long list of examples of different kinds of trends in emerging ID fields, it is suggested that ID fields with a more deliberate focus on problem solving and economic imperatives, though, gain priority, leaving discourses of critique and philosophy underprioritized. A feeling of *esprit de corps* (spirit of pride) is brought up as an ingredient for making new ID fields, and this is illustrated as illustrated in folkloriscism (Briggs, 2008). ID fields thus emerge in tandem with new academic identities.

Trajectories

Perhaps unsurprisingly, ID fields that are more aligned with existing institutional values are more likely to receive funding and get off the ground, as reflected in the prioritization of terrorism studies over fields like digital humanities in the US. To put it simply, “Economic and social capital are strong factors in growth and sustainability of interdisciplinary fields” (p. 78)

Klein uses the metaphor in physics of 'critical mass' to illustrate this phenomenon, which points to the minimal amount of nuclear fuel needed for a chain reaction to start. Without a certain amount of institutional, cultural, or support or mass, some ID fields will never be able to get off the ground in the first place; no such reaction will take place without a *critical mass*.

Another image that is used is a 'magnet', in the case of cultural studies (Bathrick, 1992). As a discipline, Cultural studies tends to attract people from different disciplines, making it a more 'multi-disciplinary' phenomenon. It is further suggested that while cultural studies is multidisciplinary in character, it is actually interdisciplinary in *practice*, since different disciplines are often involved in research aims, and additionally transdisciplinary in its *aspiration* because it attempts to study culture by engaging more closely with it outside of the academy.

Cognitive science is additionally explored as an interesting example that cuts across these various divides and disciplinary varieties. In the case of cognitive science, this has led not only to an amorphous identity but also to the spawning of new fields like artificial intelligence.

Change

The historical perspective is therefore crucial to understand how ID fields develop, change, grow, spawn into new branches, take from other disciplines, and learn to find a space within the university. Moreover, the historical perspective is not only crucial to develop to understand the change and evolution of ID fields within the university, but also to better understand them within their broader social and historical context as well. This is especially the case with area studies, which almost necessarily becomes entangled with geopolitical imaginaries and relationships in or about those areas.

On a more epistemic level, it is also illustrated that the development of these ID fields likewise becomes shaped with paradigms and dominant theories of the time. Both Canadian studies and American studies are investigated as illustration of the combined forces (p. 82).

Identity

In the case of American studies, researches often have a pluralized sense of academic identity: not only as American studies researchers, but as historians, film critics, media critics, and so on. Cornwall and Stoddard (1999) refer to this as the 'creolizing' of disciplines, where certain disciplines, or ID fields, resist a specific form and involve different identities and focal points.

Despite being more heterogenous or plural, an essential part of a discipline is how it fits into the university and becomes institutionalized. Mitchell (2002) argues that any discipline requires such an identity, but that many remain more elusive and without strict focal points, like visual studies.

The boundary work of naming once again emerges as an important theme, as the framing and naming of a field or discipline becomes essential to how it evolves and how people relate to it. To navigate these complexities and challenges, Moody and Darbellay (2018) advance the notion of 'interfiled interdisciplinary' as a meta-concept to illustrate the plural structure and form of ID fields, and they argue that dialogue across them through this conceptual innovation can help situate the position of ID fields in the university.

Summary of Part I

In Part I, Klein introduces two different boundary metaphors, one which is more 'spatial' and one which is more 'ecological'. The call she then encourages and aims to advance throughout the book is for 'ecologies of spatializing practices', which, using the image of communities of practice, places the emphasis on co-creation. In chapters two and three, the lense of inquiry gets increasingly more focused, as Klein moves from boundary discourses and then ITD fields. In doing so, themes of institutional change and inertia, conditions of knowledge production, 'the boundary work of naming' are all explored and weaved throughout the various chapters and provide the conceptual framework for Part II.

Part II : The Dynamics of Practice

Overview

The shift towards this part of the book is towards practice, which reflects the flexibility of the boundary heuristic. Not only does it provide a way to conceptualize and frame what is happening on a more 'structural' level, as Klein does in part I, it also provides a language that can be useful for practice itself. Indeed, the two are necessarily interrelated. These chapters, then, investigate the nature of communication, collaboration and learning in group settings, and the book ends with a reflective meditation on what success and failure might look like in further applications of ITD.

Chapter 4: Communicating and Collaborating

Overview

Like many others, Klein suggests that ITD is more of a verb than a noun. Building on this processual framing, it is suggested that communication and collaboration form the heart of CDCSW, or ITD. The chapter highlights core tensions and themes around how these processes unfold in practice.

Talking across boundaries

Although it is central to ITD, there aren't too many books on the topic of communication itself. But CDCSW is necessarily a kind of boundary work that requires sensitivity to talk across boundaries; Burtis and Truman (2006) even suggest that all group communication involves boundary spanning. Additionally, it is especially important in the context of ITD because actors and groups often have different logics, epistemes, interests, and imaginaries; therefore, ITD initiatives require a deep sensitivity to these issues.

Communication is a complex process, and it is difficult to come up with an exact definition. Different themes are explored as to what it entails, emphasizing different components. It is then asked whether ITD communication is truly even possible, and three options are outlined. The first, translation, involves groups integrating different meanings to create shared understandings about a certain theme. The core logic is one of consensus or mediation. The second view is that disciplinary communication is in fact *not possible*, because people are too accustomed to their own thought styles. The third view, called 'creolizing', is when different groups come together to form a shared language and set of meanings together, and in doing so, don't just cross a bridge but instead bridge a gap.

This third model, building a new language, is reminiscent of the call for ecologies of spatializing practices. Its core logic is therefore more aligned with co-creation which requires, from the start, a degree of openness to weave new boundaries. Different strategies, frameworks, research and tensions are described as it relates to this creolizing process.

Collective Identity

Communication is inherently relational and intersubjective, so the shift is then made to consider group cohesion. A few concepts and frameworks are given to consider group identity, such as relational capital (Ratcheva, 2009). Examples are given that explore possible tensions between an "I" and a "we" identity, and ultimately it is suggested that a sensitivity and healthy relationship to both are required (Freeth et al. 2019).

Other models are given for exploring the theme of group communication, and one from Gunawardena (2010) is explored in detail. It envisions group communication as a three stage process: the first stage is coordination and is roughly concerned with exchanging information; the second is cooperation, focused mostly on finding a common purpose; the third is collaboration, focused mostly on creativity and comprehensive sharing. The stages are not absolute nor uniform and it is emphasized that a collective goal and group identity is built over time. Another five-stage model is outlined by (Piso et al. 2016) that lands on similar results.

Integration

Group identity, formation, and knowledge sharing in these spaces calls to mind integration, which has been described by Pohl et al. (2008) as the core methodology underpinning transdisciplinary research. Somewhat like the concept of ITD itself, 'integration' is often widely used but its exact meaning is not always clear. Some different dimensions of integration and what it entails are explored. One model outlines four kinds: epistemic, cognitive, social-organizational, and communicative (Jahn et al. 2012).

It is pointed out that integration is not necessarily just a cross-disciplinary phenomenon, but also a disciplinary one. And in many cases, integration is more so partial than complete. There are therefore a number of different ways to potentially come to terms with the concept and what it entails. In terms of exploring whether outcomes themselves are integrative, Bammer (2020) suggested five criteria: overall circumstances, a problems history, geographic locations, and cultural differences between those affected and those charged with responding to a problem.

Integration, apart from being a standalone epistemic concept, necessarily implicates other dimensions, such as identity, power relations, and lifeworld. Three different roles for scientists in TD projects are therefore outlined: the scientist as reflective, the scientist as an intermediary, and the scientist as a facilitator. Indeed, however integration might be conceptualized or defined, it must necessarily involve acts of communication and that are contextual, grounded in specific identities, histories and meanings.

Public Engagement

Especially when it comes to TD, integration becomes essential between scientists and 'non-scientists'. Importantly, though, just because they are not scientists does not mean they don't have valuable knowledge and insights into certain situations; perhaps even more so than scientists, even if scientists often do not have a clear way to account for it. In this

respect, some researchers distinguish between the more ‘general form’ of TD and a more participatory form’ of TD- the latter of which effectively integrate societal stakeholders.

This calls to mind the different roles that various actors play in TD projects, beyond just being scientists. One typology from Weerts and Sandman (2010) includes: problem solvers, who are close to a community and are in a technical position to solve problems; technical experts, who are content specialists; internal advocates, who tend to delegate tasks and offer leadership positions; and champions, who are connected to the community and often exhibit socio-emotional leadership skills.

Related to this position, it is suggested academic knowledge is mostly concerned with “what is true”, but ITD projects require knowledge about “what is possible”, “what is good”, and “what is beautiful” (p.112). Other examples are given and explored with public participation and involvement that investigate how ITD groups can collectively collaborate towards these different kinds of knowledge.

Translation boundary work

Six key qualities are identified that are useful for communicating and collaborating: curiosity, creativity, commitment, critical awareness, communication, and connectedness (Fam et al. 2017). Additionally, different possible translation devices and boundary objects are explored that might encourage these qualities, such as visualization, design principles, and the role of language.

Chapter 5: Learning

Overview:

Within this chapter Klein turns the focus to ‘learning’. Like many other ‘boundary objects’ in this work, ‘learning’ is an extremely flexible concept, meaning it can be applied to a range of different contexts and settings with potentially different interpretations. Gibbs (2015) provides a sense of how institutionally spread out ‘learning’ is, and within this chapter both individual learning and group level learning are taken as focal points.

Interdisciplinary learning

There is a long history of ITD learning that stretches back, at least, to the 1930s with interdepartmental research programs (Brozek and Keys, 1944). Different themes and frameworks are briefly discussed that show its progression since then, but the main themes that stick out are a shift towards ‘process’ and with it, a shift from *content* to *context*. Boix-

Mansilla (2017) proposed pragmatic constructivism to frame this shift, which focuses on a purposeful, pluralistic, and provisional form of learning and education.

Another substantial shift is focusing on group learning. A few different frameworks for what this entails are explored, and Baker (2015) distinguishes between ‘cooperative’ learning and ‘collaborative’ learning. The first mostly entails division of labor towards a common goal; the second entails mutual engagement, joint attention, and co-elaboration of knowledge. Building on this distinction, McMurty (2013) suggested that educators increasingly connect learning to four different kinds of discourses: communities of practice, which points to shared interests in groups; cultural-historical-activity, which situates learning in social processes; complexity, which focuses on how different agents self-organize to create emergent properties; and actor network theory, which places the emphasis on the socio-material conditions and relationships that drive group learning.

From Identification to Transformation

Building on the theme of group learning as a process, Fam et al. (2017) suggests that learning is the most transformative outcome space of transdisciplinary work. While there are many different definitions and themes related to it, Schauppenlehner-Kloyber and Penker et al. (2015) emphasize that learning is about how language and knowledge are co-created within these projects. Akkerman and Bakker (2011) suggest that learning occurs through four stages: identification, which is a dialogical process that involves making distinctions; reflection, which entails meaning oriented learning processes; coordination, which enables cooperation to facilitate communication and connection; and transformation, which leads to more significant changes, like new boundary practices. Klein further explores these different models in various case studies.

Competencies

For group learning to happen, people in the group need certain capacities. Spelt et al. (2009) provides an overview of some of these capacities, as well as the conditions that help to enable them. A number of other typologies and cases are discussed which outline these competencies, both group and personal; many of them prioritize listening and open-mindedness as essential pre-requisites for collaboration. Even though many typologies focus mostly on individual skills, it is emphasized that both group and individual capacities are dialectical, and both required.

One example that shows this co-constitution is belonging, which many ECR’s have trouble with. The concept of epistemic living spaces (Felt et al. 2013) has been developed to draw attention for the need for guiding maps to help ECR’s in ITD navigate and find a sense of community. Likewise, transdisciplinary epistemic communities (Van Breda et al. 2016) are

suggested as an organizational innovation to help connect ECR's to networks across disciplinary and academic lines. Similarly, Pearce (2021) argues that communities are needed that can develop curiosity and inquiry instead of certainty and correctness so that ECR's can 'fail forward'.

Cultivating Competencies

The conditions which enable these competencies are explored on more of a structural and pedagogical level. Productive pedagogies (Dezure, 2017) are one example of a framework that explores possible contexts for such learning trajectories. Importantly, they move beyond the classroom and often challenge existing dynamics of traditional teacher and student relationships.

Research increasingly suggests that ITD involves more than purely academic or pragmatic based skills (Fam et al. 2017). For example, a typology of TD-orientation (Misra et al. 2015) outlines that values, attitudes, beliefs, conceptual skills, and behaviors are all essential parts of successful TD research. Some of these orientations are further described and connected to other case studies which highlight the need for interpersonal skills and systems thinking. It is also noted that having relevant expertise in multiple areas can be very beneficial for moving projects along (Hendren, 2019).

Learning in Situ

The kind of learning that this chapter is concerned with "evolves in the course of working together for a common purpose" (p. 131). This becomes especially important in the context of boundary work or boundary spaces, which are sometimes envisioned as places of contest, but themselves can actually serve as meaningful places of learning. In this respect, McMillan (2009) calls for more learning spaces that connect science and society, suggesting that mutual learning- opposed to merely solitary learning- is required to deal with complex contexts. Further, Leibowitz et al. (2016) suggest that academic identity development itself is necessarily wrapped up in the process of learning, whether this be on the practice level or structural level. In this respect, changing learning trajectories likewise requires changing the subjectivities underlying academic identity.

Towards Failure and Success

The chapter then ends with the question; what is the expertise required for cross disciplinary and cross sector work? One way to frame it is through interactional expertise and contributory expertise (Collins and Evans, 2009). Interactional expertise involves enough familiarity to participate, while contributory is a deeper expertise that allows for more extensive engagement. This likewise calls to mind the T-shaped training model, which

focuses both on a deep (vertical) along with a more common and cross-cutting (horizontal) approach. The second question that follows is: what are the implications for career prospects? Both of these questions are explored in the final chapter.

Chapter 6: Towards Failure and Success

Overview

Despite the widespread rhetorical endorsement of ITD, the day-to-day reality in many academic institutions falls short of transforming academic values and structures, let alone bridging higher education and cross-sector partnerships (p. 138). This chapter briefly investigates what success or failure might look like going forward. It is noted that both success and failure are not binaries, and there are many potential components to both.

Failing

The chapter begins by asking whether or not there are common reasons for failure. Drawing on variety of different authoritative reports from NASEM, a table reflects the main impediments and challenges that are normally faced within ITD initiatives, and they are sorted into primarily academic factors, as well as factors that occur within and across sectors. It is further cross referenced with themes of organizational structure and administration, procedures and policies, funding, resources and infrastructures, and recognition and reward (p.141). It is noted that these challenges, while separated into different categories, are inherently systemic and interrelated.

In researching cases of urban sustainability projects in the UK during the 1990s Evans and Martin (2006) suggested three degrees of radicality within interdisciplinary: while the most radical kind aims for the most co-created and transformative processes and results, the second and third form increasingly become more fragmented in workflow and less transformational in outcomes. While many projects initially intended to be radical , it became difficult throughout the project to live up to these aspirations.

A number of other examples are explored, mostly on the faculty level, which point to significant challenges in gaining a foothold in the university. Often, even if there is an aspiration or initial motivation to do ITD, whether it be in certain projects or in certain organizational innovations, they often encounter several cultural and funding challenges which make their development difficult. More often than not, these programs feel ad-hoc opposed to transformative.

Principles for Succeeding

Interestingly, and reminiscent of what Pearse said about failure (2021), Darbellay (2019) suggests that what looks like failure can be converted into conditions for success. Importantly, though, just like failure, success is not one thing. As all people, groups, projects, departments, and universities are necessarily different, things will always look different. Six principles are briefly defined to help guide success. They include:

- 1) Transparency in all aspects of boundary work
- 2) Informed use of best practices
- 3) Consistency and alignment of separate activities in a systematic approach
- 4) Effective balance of disciplinarity, cross-disciplinary, and cross sector work
- 5) Credit for rather than marginal dismissal of boundary-crossing work
- 6) Appropriate criteria and a multimethodological approach to evaluation (p. 145)

Taken together, these principles distill the core themes and nuances in the book: the centrality and importance of communication; an awareness of context and building expertise within ITD; the balance between structure and open-endedness within ITD efforts; drawing out the varieties of expertise within a team; and the need for more genuine institutional support and encouragement of these kinds of initiatives on both a structural and practice level. The section continues to explore some of these nuances, noting especially that these are not a strict formula nor magic bullets, and that context always calls for unique forms of action.

The Future of ITD

Frodeman (2017) outlines three questions that shape interdisciplinarity today:

- 1) What is its place in the political economy of knowledge?
- 2) Will it become central to the transformation of the 21st century university?
- 3) Are other vocabularies signaling displacement of the academy from the center of knowledge production, such as accountability, impact, and relevance?

Indeed, the very investigation of these questions will undoubtedly be shaped by the practices and dispositions through which this investigation occurs. Darbellay (2019) sketched four possible scenarios for the future of ITD: Scenario 1 is a form of tolerance within the existing disciplinary system; scenario 2 is a form of incremental change without radical interrogation into the nature of the university; scenario 3 involves this more radical interrogation into the disciplinary organization of the university, and might lead to conflict; scenario 4 postulates a postdisciplinary vision of openness, collaboration, in a more anti-disciplinary stance.

While these scenarios are only rough trajectories, the future of ITD can certainly be said to be shaped by the people that guide this change. Darbellay (2017) additionally highlights three kinds of characters that might be relevant: a conservator, who might evolve toward reform through participation in ITD projects, but could also potentially criticize its approach; a warrior, who might push for more radical transformation but likewise could retreat to a more moderate position; and a reformer, who is more likely to work towards disruption of the current system, and might do so in potentially revolutionary ways. The discussion then follows with the nuance of academic identity within the context of this potential institutional change.

Resources

The book ends on providing some potentially useful organizations for more information or for potentially getting further involved in communities related to ITD efforts. The challenge ahead, Klein states, is not simply to gain a more informed awareness of these documents and resources, but “to make better use of them” (p.157).

Critical analysis

Much like the way that the 1991 publication of *Interdisciplinarity* provided a canonical grounding for ITD as a discourse at the time, I’d like to suggest that this publication accomplishes a similar feat, but with a different context and likewise with a different theoretical emphasis. In this respect, *Beyond Interdisciplinarity* does not merely update earlier definitional debates, but instead shifts the level of analysis from what interdisciplinarity is to how boundary practices might reconfigure institutional and epistemic conditions of knowledge production. In doing so, it places a more intentional focus on conditions and structures of knowledge production writ-large, and how different conditions lead to different outcome spaces.

Importantly, two significant changes have stood in the thirty years since the earlier publication. First, as Klein points out at the start of the book, ITD has received increasing rhetorical attention and application, making it a disparate, widely used, and a heterogeneous concept (p.9). At the same time, it continues to face significant institutional challenges (Salmela et al., 2025). This leads to a situation in which there is both little agreement among different actors regarding *what it is* as well as a continued ham-handedness regarding its institutional integration. Indeed, these two properties are not necessarily separate: universities talk about it just as much as they seem to religiously forestall its development (Wenger, 2000).

Klein notes early on that she is mostly responding to the heterogeneity of its definitions. However, it becomes increasingly clear that the institutional transformation of universities is at the center of this work, and that both the heterogeneity of ITD as a concept and its challenges for institutional change can be dually approached. This dual approach happens through a boundary heuristic, a framework which grew considerably through its application in Science and Technology Studies (Lamont and Molnar, 2002). By utilizing this heuristic, Klein not only seamlessly integrates these two themes but does so in a way that pushes researchers to move beyond the exiting boundaries of ITD discourse. The aim is not to provide another framework for conceptualizing ITD, but to reconceptualize some of these efforts altogether under a broader and more flexible framework.

Based on the reception of the work, there is reason to believe that perhaps these moves were a bit too subtle. As mentioned at the start of this paper, the only application of Klein's framework in action has been from Pohl, et al. (2019), which applies Klein's boundary heuristic to frame and guide a transdisciplinary project on water management. Further, this application occurs *before* the publication of *Beyond Interdisciplinarity*, and as the paper made clear, was with Klein's permission. Therefore, it is possible that Klein, in the time between 2019-2021, updates the framework in certain ways which allow for more subtle themes to emerge. Indeed, it seems likely that this incongruity can be what led to what seems like a systematic under-reading within the field of ITD. Whatever the case, in their 2019 article titled "Exploring Julie Thompson Klein's Framework for Analysis of Boundary Work", the authors provide a methodological reflection of their engagement with the framework:

"What, then, have we learned from using Julie Thompson Klein's conceptual framework to analyze boundary work in two of our projects? First, we have learned how the concepts involved – like glasses – help (or force) the user to see and analyze interdisciplinary and transdisciplinary projects in a specific way. When analyzing projects using the concepts of boundary work and boundary crossing, we first looked for differences between groups, be it researchers from different disciplines or actors from different sectors of society. Only in a second step did we focus on boundary objects and on how boundaries are crossed. For some of those working in interdisciplinary and transdisciplinary projects, this process might seem counterintuitive, because IDR and TDR are about integration and hence about what the participants share rather than about what makes them different. For others working in the field, looking for differences seems a logical way to begin any interdisciplinary or transdisciplinary project: to acknowledge differences in order to be able to build on them for collaboration. So, the framework sets a clear focus on boundaries, a focus that might not be appreciated by everyone." (Pohl et al. 2019)

Crucially, this reading foregrounds the spatial metaphor of boundaries while underplaying the ecological metaphor that runs throughout Klein's framework. This spatial image begins with difference and demarcation; boundary work in this context becomes a matter of mediation, negotiation, and meeting in the middle. For the sake of simplicity, this will be referred to as the 'strategic interpretation'. Under the strategic interpretation, this framework, 'like glasses', helps to see boundaries more clearly so that they can be mediated across. The focus in strategic interpretation, as in strategic boundary work (Kinchy and Kleinman, 2003), is to use the framework within a specific project.

However, I'd like to suggest another interpretation is possible, more grounded in the notion of 'routine boundary work' (Kinchy and Kleinman, 2003), and that the book's conceptual power lies in this interpretation. This is not to suggest that the strategic interpretation is *wrong*, but that it is only part of the conceptual framework within the book; importantly, while the strategic interpretation is more closely aligned with operationalizing the notion of spatial boundaries, the routine interpretation is engaged with a more ecological view of boundaries, and it is this emphasis on ecological boundaries which Klein seems to ground her core arguments.

A little more digging into the paper in which Klein draws on to this claim can illuminate this distinction. Winter (1996) looks at how knowledge is organized within libraries, and he is critical of the more rational, linear logic that defines how they categorize knowledge and, moreover, of their overall 'place' within broader knowledge ecologies. Put simply, he is critical of the more 'spatial' kind of boundaries that shape libraries, which organize knowledge around turf, territory, and binary distinctions. Indeed, the 'spatial' metaphor of boundaries is perhaps nowhere more evident than in how libraries are structured: they are wrapped in demarcations of Dewey decimals, sections and categories that precisely frame where a book belongs and where it doesn't.

While this logic has its benefits, Winter argues that libraries should move beyond this more binary, spatial logic to a more ecological one. This means not just reorganizing how boundaries are drawn and demarcated *within* its own system but also, and crucially, how these boundaries are connected to the broader knowledge ecology and world around it. In this respect, Winter's critique of libraries is not merely a call to reorganize internal demarcations but to rethink how those demarcations connect to the social and political worlds around them. He calls for libraries to be politically engaged: and as such, for boundaries that are not merely spatial and binary but more meaningfully interwoven with its surrounding community and context, allowing for new possibilities to emerge.

To illustrate the difference between a strategic and routine interpretation, it might be worthwhile to imagine what a 'strategic' interpretation of Winters call might look like. Imagine, for example, that the library receives a new book that is at once a rich blend of history, psychology, memoir, and philosophy. The categorization of this book becomes somewhat of an anomaly for the workers in the library. The workers in the library- assuming its large enough, and there are experts in each of these areas- come together to try and categorize the book. The book is a significant contribution to each of these four different fields. In response, the coordinators of the library call these experts together to do some boundary work to try and find out where this book belongs. In the meeting or set of meetings that follow, each of the experts explores why they believe the book may or may not fit into each of their respective categories.

Throughout this strategic boundary work, the experts and coordinators learn a great deal: not only about the book itself, but about the various disciplines in which it stands as a unique contribution towards; each of them has greater insight about the various subjects and expertise in which this book is majestically intertwined. This boundary work illuminates, 'like glasses', these different nuances with more clarity.

Where do they place the impressive, anomalous book? Indeed, it could be placed anywhere; they could even make a new category, but the point lies elsewhere.

Winter's (1996) call is not just for more sophisticated working across boundaries within the library itself; it is about reimagining the very boundaries on which its social form and knowledge production is constituted in the first place. While a strategic interpretation serves as a meaningful framework to learn, collaborate, and create knowledge within existing boundaries, a routine interpretation calls for a shift in the conditions of engagement. It is a call for libraries to establish open-ended boundaries with the world around them- where, for example, this book might inspire a community reading that creates dialogue around existing political or social challenges in the community. In this respect, it is a call for boundaries that are more aligned with the 'ecological' metaphor; for boundaries that are not merely spatial and binary but aim to open new possible structures for knowledge ecologies altogether.

Klein's call for ecologies of spatializing practice is similar. She is not simply calling for practices that can work *across* these spatial boundaries, as Pohl et al. (2019) seem to emphasize, but instead calls for new kinds of boundaries that can generate different ways of producing knowledge. In this respect, she is calling for new *spaces* of knowledge production; not a sharper vision of the boundaries that already exist. Like Winter's call for libraries to become more flexible knowledge ecologies, Klein is calling for academic institutions to enable different kinds of communication and collaboration to enable new

kinds of meaning and relating, moving beyond spatial logics to embrace more ecological logics.

Whereas the strategic interpretation treats boundaries as objects to be crossed, the ecological interpretation treats boundaries as dynamic conditions through which new forms of knowledge and institutionality emerge. Since Klein is doing her own boundary work of definitions and leaning into paradox, this distinction is not sufficiently clear in the work and may incline readers toward a more strategic interpretation, which Pohl et al. exemplify in their assessment. Importantly, though, Klein is not simply trying to encourage project-level boundary work for ITD projects; she is implicitly proposing a reconfiguration of institutional boundary conditions.

Simple and Complex Boundaries

To further illustrate this difference, I would like to argue that there is an important distinction between these two boundary metaphors that Klein outlines and that perhaps the language of ‘boundary ontologies’ is more fitting. This distinction can be developed by drawing on Klein’s own earlier work on simple and complex models of education (1997). The simple model is more disciplinary, more structured by departments, and defined within a given and strict set of rules. The complex model, by contrast, is characterized by networks and openness; these are non-hierarchically organized and focused more on themes or problems rather than disciplines. Further, whereas simple models of education promote content and linearity, complex models of education invite context and non-linearity.

Trowler and Knight (2002) have criticized this model for being an act of ‘contextual simplification’. They suggest that, in reality, it is more of a mix of the two. Klein acknowledges this point (p. 33), but another point is perhaps worth bringing up: all scientific knowledge is, in its own way, a contextual simplification. Reality is always more complex than whatever we can say about it. However, in some cases making these distinctions can be useful so long as it is not overdone; within the work, Klein hesitates to do this, perhaps because of this very critique, but this has come at the cost of what seems like a systematic under-reading.

To apply this metaphor of simple and complex education to boundaries, then, simple boundaries might be characterized as boundaries which are more closely aligned to the spatial metaphor. In this respect, they operate with pre-given assumptions of what is here or there, of what is right or wrong. They are rooted in a more linear understanding and enactment of what boundaries are. Strategic boundary work, which is more aligned with this spatial imagination and enactment, begins by highlighting *difference*, and then working to mediate or negotiate within that difference. While there is an emphasis on reaching across

boundaries, there is, at the same time, an implicit ontology that people remain in their own worlds and spatial demarcations.

Complex boundaries, on the other hand, might be said to have a more open-ended and porous structure. These kinds of boundaries, which align with the ecological metaphor, do not begin with difference but instead begin by foregrounding emergence. It is about what is made in-between; the core logic is not negotiation but co-creation. In this respect, complex boundaries might be understood as boundaries that enable processes of what Grant calls ontological commoning (2025), which involves “finding ways to make sense of each other’s conceptual models, without erasing differences, but generating a wider perspective within which individual perspectives can be inter-related” (ibid.) Ontological commoning does not assume a given ontology or logic from the start; its very aim is to avoid disciplinary capture and to create a common understanding or language around a certain topic. It therefore *requires* a sense of openness and emergence; much like communities of practice or creolizing, ontological commoning involves the creation, or weaving, of a shared world instead of imposing one from the outset.

While many examples are given throughout the book that illustrate this nuance, perhaps the clearest and most direct example is Klein’s question in chapter four as to whether disciplines are capable of ‘talking to one another’ (p.99). One view holds that it is altogether not possible, while the other two - outlined in the section *Talking Across Boundaries*- are that translation and creolizing are both possible forms of communication across disciplines. Importantly, these are identified as *different kinds* of communication. Translation operates on a logic of consensus or mediation, where actors come together from their respective worlds to translate across them. Creolizing, on the other hand, operates on a logic of co-creation, requires only openness and engagement from the start and result in new and shared meanings within a group. Roughly speaking, ‘translation’ might be said to align with conditions of simple boundaries, whereas creolizing might be said to align with conditions of ‘complex boundaries’.

In summary, then, simple boundaries as outlined here are boundaries that foreground a specific ontology and, in doing so, align more closely with the spatial metaphor. They tend to employ strategies of translation and negotiation, which deepen understanding but remain within more linear conditions and logics. Complex boundaries, on the other hand, foreground ontological commoning and the possibility of more radical emergence, aligning with the ecological view and a logic of creolizing and co-creation. Importantly, both kinds of boundaries point to the conditions that situate knowledge production practices and the boundary work and weaving that might occur within them.

In this respect, the institutional transformation of universities might be framed as the process of forming complex boundaries. ‘Ecologies for spatializing practices’ in this sense involves establishing boundaries that enable ontological commoning and, in doing so, foreground the emergence of new kinds of outcome spaces and forms of collaboration. This does not mean getting rid of simple boundaries; it instead suggests that ITD work should not be governed by the logics of simple boundaries, as they have fundamentally different aspirations and possibilities than complex boundaries. Klein’s work, under this interpretation, is not only concerned with improving project-level boundary work; she is offering a way to reconceptualize the very institutional contexts and conditions for knowledge production.

Relevance Reflection

Given that relevance is neither self-evident nor conceptually stable (Brunet, 2024), it becomes necessary to reflect on relevance in more situated contexts (Brunet et al. 2025). Sigl and Fochler (2025) suggest that four kinds of practices might help to develop competencies to create an institutional culture of relevance in academic research. The first practice, *reflection*, emphasizes the importance of academic identity and subjectivity in relation to a more complex and inter-connected social fabric; the second practice, *re-valuing*, emphasizes the importance of the perceived value of one’s research within this social fabric; the third *situating*, invites a more multi-perspectival engagement towards one’s own ignorance and strengths within and in relation to different knowledge ecologies; and finally, synthesizing invites a deeper and more holistic reflection to enable a more integral imagination with respect to knowledge production, as well as the aforementioned themes.

This section, as an experimental foray into *doing relevance*, will reflect on these four practices as it relates to engaging with Klein’s work and where this overall work fits into to the lifeworld of its author, especially as it relates to carving out (or not) an academic research career.

One further note seems interesting to emphasize: integrating practices of relevance reflections within academic writing might provide one way to challenge the existing aesthetic constraints of traditional academic writing and discourse. For one, it might be a useful tool to demonstrate a researcher’s ability to critically engage with and identify complex themes- namely, by outlining and engaging with their *relevance*- and in doing so, potentially provide one possible way of evaluating things like research proposals in a more effective and fair manner. Indeed, both the number and quality of research proposals have skyrocketed due to the rise (and perhaps unreflective use) of LLM’s, and those researchers

who rely less on LLM's suffer. In response, reflecting on relevance could provide a way to evaluate a researcher's ability to position and situate this research within the larger social fabric and, of course, their own life.

Reflecting

'Academic identity' is a big theme in the book; indeed, the work ends not only with a call for a deeper engagement into these themes of boundary work and weaving, but is supplemented with a typology from Darbellay (2019) that outlines different kinds of positions academic characters may embody to push the boundaries on existing institutional forms (p. 152). With increasing degrees of radicality three positions are outlined: conservator, warrior, and reformer. Interestingly, this reflects three strategies of institutional change from Kahn (1979) earlier outlined in the book: conservative elite, liberal academic, and radical (p.66) Exploring where I might fit into the academic system, or whether I fit at all, seems a useful starting point.

On the one hand, becoming an 'academic', atleast in the conventional sense, is not an easy career choice. My experience thus far, for a variety of different reasons, has been challenging. The kinds of 'epistemic living spaces' (Felt, 2013) that have allowed for a sense of community and critical reflection have been those that are not bound by the aesthetic constraints of academic discourse, and are, to use Kleins language, 'boundary spaces' (p. 30). More traditional academic spaces can often hamper the possibility for more creative and open-ended inquiry.

At the same time, it's hard to imagine doing anything else. The skills and capacities that I've developed, for the most part, might be summed up as the ability to critically reflect on things, or what Keats called 'negative capability'. Generally speaking, this has little to no value in the job market- other than producing some kind of knowledge.

In relating this to more scholarly interests, the social problems I am primarily concerned with and find both interesting and challenging are imagining and embodying new kinds of social forms and social organization. Exactly how this can happen is a difficult challenge, and there is certainly not one 'answer'; indeed, the search for one clear answer or solution often re-installs logics that, in my opinion, need to be moved beyond. The 'paradox of embedded agency' (Seo & Creed, 2002) gestures to this tension, along with the increasing research around ITD researchers struggling to fit in and find a sense of belonging in an academic space (Guimaraes et al. 2019). Academic careers, along with so many other things, require re-imagining, but the space and conditions to re-imagine them is pressurized by the very constraints that need to be moved past. Darbellay (2019) sums it up nicely when he says: "These possible epistemological and institutional mutations would require actors

who are cognitively available and open to change, or even frankly “undisciplined,” with the goal of transforming academic institutions into the university of the future by fostering breakthrough innovation.”

That is partly why this text has been so rich and meaningful. Klein provides a solid framework for considering these things, and I believe this text contains much more than I outline here in this paper. She is asking exactly the right questions: how can the very conditions of knowledge production shift? How can academic institutions transform? How might learning and career trajectories adjust to create different ways of being and knowing in academia?

Value

Given those considerations, one question that emerges is: well, is institutional change and transformation really necessary? Is it valuable to consider themes of institutional change, the nature of social organization, and social form? If so, how and to what degree?

A lot can be said here; perhaps so much that the reflection instead requires a shift in the other direction. Namely, not whether or not institutional transformation is required but instead, the degree in which one can even genuinely engage with topics within existing institutional constraints. Indeed, it becomes a moving question to consider: if one wants to really make sense of and engage with these complex themes, what kind of career opportunities are available? And what kind of conditions are required?

While it must always involve a balance, I’ve been fortunate enough to meet a few people who provide an interesting model of what might be called ‘open ended learning’. Open ended learning involves, to put it simply, learning autonomously. In this respect, it involves engaged research on one’s own terms, without being significantly constrained by institutional or material constraints. Michel Bauwens is the standout case for me; without belonging to a specific academic institution, he has produced, through his P2P wiki, some of the most relevant work I have ever encountered. There is, it seems, a growing number of people who engage with these more complex themes in ways not fully captured by conventional academic routines. Of course, in most cases, it is a balance. And in the case of people who do breakthrough research through open ended learning, the drawback is that their work often remains ‘on the fringes’ and is therefore outside the institutional radar.

Indeed, providing more open-ended conditions for knowledge production is, in a way, exactly what Klein is arguing for throughout this book. The more interesting question that emerges at this intersection is: how might epistemic communities engage in open-ended learning collectively?

Returning to the theme of value, though, I do not want to claim that institutional transformation is the most important consideration; but I believe deeply engaging with it is difficult within most epistemic living spaces I have encountered, and that it requires a certain kind of disposition. Having a job or career that provides conditions for this is not easy; and while open-ended learning provides an interesting case where some people who can learn on their own, they likewise remain, to some degree, isolated, and don't get embedded within institutional discourses. In terms of a theory of change, then, the approach of 'building a new model' or 'planting seeds' seems to be the right one, but that this is not an easy balance, and the notion of the 'hinterland of relevance' seems to provide a generative metaphor for exploring these nuances .

Situating

Where does this research sit within a broader ecology of knowledge?

As mentioned, the social problems I am interested in exploring are more so concerned with social form itself. Coming to terms with these questions requires new ways of producing knowledge *in relation*, and in further considering the very conditions of this knowledge production. Indeed, I believe that Klein provides a useful framework-paired with others-which can further explore these tensions.

Synthesizing

As an early career researcher, I certainly would not claim that this paper achieves any kind of exceptional synthesis. As I argue, Klein herself seems to do that work; in reviewing the book, my aim is to engage with and mirror her practices, to the extent that is possible. Although perhaps not a conventional academic approach, I have found the reconstructive method genuinely valuable, and the same goes for the critical analysis: even a partial critical engagement has helped to clarify things that were not previously clear to me.

It also seems, on this point, interesting and perhaps even important to further reflect on the existing aesthetic constraints of academic writing, which this paper aims to challenge, to the extent that it can, by providing a critical reconstruction of Klein's own synthesis. Indeed, given the pervasive LLM rupture, the landscape of academic communication and discourse will undoubtedly continue to change in significant ways. Instead of trying to police their use, one might be inclined to ask: what kinds of writing might LLM's enable? One way this might be asked is: how can the rise of LLM's create a critical and profound re-evaluation of the aesthetic constraints of academic writing and discourse, particularly in ways that make both more *relevant*?

Klein herself seems to provide one example. While fitting within existing aesthetic constraints, she nonetheless pushes them by using language in both paradoxical and playful ways, through a kind of hermeneutic judo that makes the work not only challenging but increasingly layered the more one returns to it. And indeed, it is only through this unconventional critical reconstruction that some of these themes become clearer.

Conclusion

This paper has argued that Klein's boundary heuristic, as it appears in her text *Beyond Interdisciplinarity: Boundary Work, Communication and Collaboration* has been under-read as strategic mediation rather than institutional-ecological reconfiguration. The more strategic interpretation, which treats boundaries as things to be crossed or negotiated, is certainly present in the text but it does not exhaust the conceptual potential of the work. Importantly, the strategic interpretation, present in Pohl et al. (2019), occurred before Klein's publication, "with her permission", and this lag in time could very well be the reason that this interpretation is present. Another interpretation, as I hope to have argued, is also available; in this reading, Klein is not offering a better pair of glasses for seeing existing ITD boundaries, but is instead offering a framework for reconceptualizing the institutional conditions in which those boundaries operate.

While I hope to suggest that it is a powerful conceptual framework for transforming academic institutions, it certainly is not the only one. Assemblage theory, for instance, has recently been applied to frame how TD work 'deterritorializes' and creates new territories within universities (Tsao et al., 2025), and this framework likewise provides its own unique interpretive emphases. Moreover, engaging with Deleuze and Guattari more thoroughly might provide more interesting possibilities to frame these questions.

And of course, creating a Hinterlands for Doing Relevance (Sigl and Fochler, 2025) likewise provides another compelling framework. The theoretical advantage here is that it places the emphasis on practices that researchers can participate in for cultivating this hinterland. Additionally, the ecological emphasis in the metaphor points to its complex and organic structure- something that grows over time and must, as the researches suggest, be cultivated through these practices.

As all three frameworks emphasize, though, it is not merely a matter of conceptualizing, but of *doing*. Klein notes at the close that the real challenge ahead is about making better use of what currently exists. In the same token, though, it is crucial that we fully understand and appreciate what is already there so that we can make the best use of it.

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