



# “Fractional” Vocational Working and Learning in Project Teams: “Project Assemblage” as a Unit of Analysis?

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## Abstract

Situated and Activity theories have exercised a significant influence in the field of vocational learning for some considerable time, both sharing a focus on bounded forms of work and forms of learning that facilitate learning in, or to changes to, bounded forms of work. Yet much learning occurs in unbounded contexts often referred to as projectification, where collaborations occur only for the life of a project thereby creating new contingent contexts for learning. Given the existence of this form of working and learning, what type of unit of analysis (UoA) is required to analyse that vocational working and learning in the context of projectification? To address this question, the paper advances the following inter-theoretical argument. Firstly, it is timely to develop a new unit of analysis (UoA) to capture the fractional (intermittent, discontinuous and concurrent) working and learning dynamics associated with the forms of projectification, where funding has to be procured in order to commence. Secondly, that unit of analysis is constituted by the concept of project assemblage, which is based on ideas from Actor Network Theory, Cultural-historical Activity Theory and Cultural Sociology. Thirdly, this new UoA enables researchers to identify the way in which project teams, where members are coming in-and-out, learn to use their different forms of specialist activity to enact objects, why team members will have different backgrounds and understandings of their work, why objects may not cohere, even though team members may treat them as unified and coherent, and how team members learn to incorporate one another’s insights and suggestions, and establish a finalized object.

**Keywords** Fractionality · Project teams · Project assemblage · Vocational working and learning

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## Introduction

In the last 30 years, two publications, in particular, have had a significant impact on the field of vocational learning: Lave & Wenger's *Situated Learning* (1991) and Tuomi-Gröhn & Engeström's book *Between School and Work* (2003). One unifying thread between both books and the secondary literature they have spawned is a pronounced tendency to treat organisations as well-defined and bounded entities, even if they have fluid internal 'landscapes for learning' and are part of networks or coalitions. This is primarily because the books, tacitly, assumed that members of organizations held full-time and permanent positions. Yet an increasing amount of work has been handled differently since the 1980s: by temporary arrangements of specialists, who having secured funding tend to work across organizations and disciplines rather than within them (Rainie & Wellman, 2012; Lundin et al., 2015), and make a "fractional", in other words, temporary and fluctuating contribution to the work process (Guile, 2011, 2012). This process, which has been referred to as, "projectification" (Grabher, 2003), requires therefore learning arrangements and learning practices that support people to work together "fractionally", as has occasionally been acknowledged in the V&L literature (Guile, 2011, 2012). We define projectified work therefore as an *assemblage where participants secure funding to enact and bound their work activity fractionally*. Projectification is therefore a particular context for vocational, most commonly but not exclusively, adult working and learning that has hitherto received little attention in the field of vocational learning as the limited references to that concept attest. Our argument is therefore that it would be helpful for the field of vocational learning (and potentially other fields as we acknowledge in the conclusion) to formulate a unit of analysis (UoA) to capture the dynamics of fractional working and learning.

In this paper, we first acknowledge the diverse array of UoAs that have either been inspired by Lave & Wegner (see below) or that have been adopted and developed by Engeström (see Engeström & Sannino, 2021 for a summary) over the last three decades, and their impact in the field of vocational learning. In particular, we note the enduring influence of situated and activity approaches, in their terms "ecological approaches", in the field of vocational learning and UoAs through reference to a recent special edition of *Learning, Culture and Social Interaction* edited by Damsa and Jornet (2021). Secondly, we overview the characteristics of projectification to clarify (a) why it is different from well-defined and bounded work, including networks and coalitions and (b) how one popular UoA, Engeström's (1987) *activity system*, struggles to capture the working and learning dynamics associated with projectification. Thirdly, we explain how we have drawn on the concepts of situatedness and the object of activity, in conjunction with the concept of "fractionality" and "assemblage" (Law, 2002) from Actor Network Theory and "conceptions of worth" (Boltanski & Thévenot, 2006) from Cultural Sociology, to propose a new UoA to understand *learning-in-projectification*. We illustrate how this UoA allows the fractional vocational working and learning dynamics associated with projectification to be revealed with examples from our studies of projectified work. We conclude by acknowledging how the proposed UoA, on the one hand, reveals previously

overlooked aspects of vocational learning and in the process contributes to the discussion Jornet and Damşa (2021, p.8) have inaugurated about UoAs for studying vocational and professional learning by “identifying, through inquiry, units that denote flexible, developing and concrete wholes, rather than abstract, general but fixed units;” and, on the other hand, introduces an additional UoA to sit alongside extant ones.

## **Vocational Working and Learning: Situated and Activity Perspectives**

Historically, the field of vocational learning has focused on learning within bounded contexts or across bounded contexts, by which we mean the classic sites for vocational learning – educational institutions and workplaces (see *inter alia* articles in the *Journal of Vocational Education* and *Journal of Vocations and Learning*). We explore this issue below from both situated and activity perspectives in relation to UoAs that have been developed in vocational learning.

### **Situated Vocational Working and Learning in and Between Bounded Contexts**

The publication of *Situated Learning* (1991) had considerable impact in the field of vocational learning. In the mid to late 1990s, the concepts of community of practice, participation in practice and technologies of practice inspired vocational researchers globally to talk about a shift in research from a focus, on the one hand, on “apprenticeship as an institution”, that is, firm and/or sectoral conditions of employment, the balance between on- and off-the-job training etc. to a focus on apprenticeship as a ‘model of learning’ (Guile & Young, 1999) and, on the other hand, workplaces as not merely sites of employment but also sites for learning throughout the life-course (Billett, 1994). Over the next decade, Lave and Wenger’s argument that learning was best viewed as a social, rather than psychological, process occurring within one or more bounded contexts has been extended and critiqued in a number of ways. Some notable examples of the former are Aarkrog’s (2005) exploration of the way in which communities of practice facilitate and delimit the opportunities for vocational legitimate peripheral participants to learn, Billett’s (2002) notion of “co-participation” among less and more experienced workers in vocational and workplace practice, and Fuller et al.’s (2005) inclusion of the institutional factors that facilitate participation in communities of practice (2005) While notable examples of the latter are Billett’s (2006) critique that the concept of community of practice has an overly collective notion of learning at the expense of learning as an individual process, Fuller and Unwin’s (2004) argument that it is characterised by an overly linear notion of the transition from novice to expert in apprenticeship, and Paavola and Hakkarainen (2005) critique that the concept of participation failed to capture the “knowledge creation” process that occurs in occupational practice. Over the intervening years, the extensions, critiques and extrapolations of Lave and Wenger’s original argument have been further developed in the field of vocational learning and, in the process, generated a rich array of new concepts, for example,

“connectivity” “socio-materiality” or resources, for example, “affordances”, “connective curriculum” and “epistemic objects” researchers can use to identify the diverse forms of learning associated with vocational practice (see *inter alia*. Aprea et al. (2020); Billett, 2004; Billett et al., 2010; Fenwick et al., 2012; Kyndt et al., 2021; Nerland, 2007; Stenström & Tynjälä, 2008).

In parallel, Yrjö Engeström’s development of his concept of an activity system (Engeström, 1987) via his engagement with Beach’s (2003) notion of “consequential transitions” and Star and Griesemer’s (1989) concept of “boundary objects” in the edited collection *Between School and Work: New perspectives on transfer and boundary crossing* (Tuomi-Gröhn & Engeström, 2003), introduced an entirely new way of researching students’ back-and-forth learning across contexts. In that edited collection, the concepts of object of activity and boundary object were presented as tools that researchers could use to assist educational institutions and workplaces to re-think how they could collaborate to “co-construct” new kinds of learning arrangement and environments to support vocational student and organizational learning (Konkola et al., 2007 for subsequent work in this vein).

Despite these imaginative and creative explorations of vocational learning, the common thread running between the situated and activity approaches in the field of vocational learning is that, with few exceptions (Guile & Lahiff, 2017), writers conceptualise workplaces as fairly bounded organisations with distinctive occupational and organisational cultures and, as a result, operate with UoAs that reflect that boundedness. An assumption that also tends to apply even when writers investigate inter-professional/vocational learning between different organisations as they seek to expand a shared object (Edwards et al., 2009) or sites where practices intersect as participants explore one other’s motivated engagement with an evolving object (Edwards, 2012). Nevertheless, some highly regarded examples of UoAs that have emerged from the situated perspective to research vocational learning in single or dual bounded contexts being Billett’s concept of a “workplace learning curriculum” and Tynjälä’s (2013) “3-P” model of workplace learning, and Fuller and Unwin’s (2004) “expansive” and “restrictive” continuum. In the case of the concept of boundary crossing, as Akkerman and Bakker’s (2011a) seminal article “Boundary Crossing and Boundary Objects” highlighted, it inspired a flood of research using the potential learning mechanisms that can take place at boundaries – “identification”, “coordination”, “reflection”, and “transformation” – as UoAs for development of intersecting vocational identities and practices. In subsequent publications, Akkerman and Bakker (2011b; Bakker & Akkerman, 2019) explored the implications of their ideas about the learning potential of boundary crossing between school and work practices for the vocational curriculum by arguing that their mechanism could be used “heuristically” to identify issues that are currently not addressed within vocational education. Consequently, even though Damşa and Jornet (2021) acknowledge in their special edition on UoAs that “*ecological units denote evolving social wholes that are not pre-established but actually found in and through inquiry*” (italicisation in original) with a very clear nod to the enduring influence of situated and activity approaches, their special edition perpetuates the above assumptions about the

bounded nature of work activity with their empirical exemplifications of emergent UoAs.

Yet these assumptions are challenged by historically recent changes in how work is organized.

## **The Projectification of Working and Learning: From Bounded Contexts to Interdisciplinary Assemblages**

Over the last three decades, there has been a discernible trend in longstanding industries, such as automobiles, advertising and chemicals and new industries, such as digital media and Information Technology to, in the case of the former, replace permanent functional teams with temporary project teams (Ekstedt et al., 1999; Lundin & Söderholm, 1995); and, in the case of the latter use projects as their organising principle (Grabher, 2003). Furthermore, projects have also increasingly become the organising principle of work for cross-sectoral contact-based work, for example, environmental design, which involves professions, such as, architects, builders, interior designers, urban planners and structural engineers working together (Lundin & Hartman, 2000). The net effect is that interprofessional teams in these sectors: (a) are constituted temporally to address specific problems; (b) are distributed spatially across a range of sites; and, (c) often have little, if any, prior history of working together.

### **Projectification and Work**

The concept of *projectification*, which was originally coined to refer to the above developments in firms (Midler, 1995), has gradually come to be applied more widely to refer to the spread of that process throughout “societies” (Berglund et al., 2020) and even to the formulation of “selves” and “identities” (Fough et al., 2016). Notwithstanding the diversity of applications, it has been argued that projects have become the prevalent form of “organizing work” (Fough et al., 2016: 21) to such an extent that “it is hard to imagine an organization that is not engaged in projects” (Evrard & Nieto-Rodriguez, 2004: 4).

Projectification therefore has ushered in new ways of working, living and being, although not necessarily new historic forms of activity. There have been antecedents to projectification – it is how movies are made and houses have historically been built – and in such cases the pre-condition is securing funding for a particular project (Morris et al., 2011). Once funding has been secured, a project team is assembled, in other words, temporary arrangements of specialists, often working across organizations and disciplines rather than within them, often for an extended period of time. Not only do these specialists work on different projects serially, they may work on different projects concomitantly, and their work on any given project may or may not overlap with others’ work. For any given project, the specialists deliberate over what

emergent object they can share, necessarily understanding that objective differently, due to their different specializations and their work at different stages of the project.

Consequently, one feature of projectification has been the gradual erosion of the classic functional and differentiated division of labour and the growth of interprofessional working and learning (see *inter alia*. Midler, 1995; Grabher, 2003; Lundin et al., 2015; Edmondson & Harvey, 2018; Barley et al., 2017). This is particularly the case for most forms of “inter-organisational temporary organising” (Burke & Morley, 2016) including the type of projects – business projects – that are the focus of this article: the commissioning process or entrepreneurial search for funding process results in the creation of project teams that consist of, on the one hand, professionals with a diverse range of specialisms who often have little, if any, prior working relationship with one another (Edmondson & Nembhard, 2009) and, on the other hand, teams where members come in-and-out of the work process in relation to the contribution they are making (Mortensen, 2013). This prevalence yields an increase in inter-vocational or professional learning as these temporary arrangements of specialists must learn to work together in short-lived collaborative communities (cf. Adler & Heckscher, 2007). In projectified work, these specialists need to learn enough about each other’s work and the project’s objective that they can work together. But this vocational working and learning, which primarily but not exclusively involves experts rather than novices, is enacted neither *within* nor *across* stable boundaries, but rather, among fluxing assemblages of specialists (Guile, 2011).

The above development presupposes the following question – *What type of unit of analysis is required to analyse that relationship?* That is, what analytical decisions must we make to bound our investigations in ways that let us capture the relationship? This question becomes urgent as we consider that in projectification, different specializations or professions may enact objects differently – that is, the object of a cross-specialization collaboration may be ontologically unsettled, where specialists are continually re-negotiating an object, even if there is an overarching agreement about its desired general outline, for example, the redesign of a building, among themselves and the client who commissioned the project. Hence the object is continuously unsettled, with intermittent dialogues that address different specializations’ conceptualizations of the object. Moreover, specialists may enact that object intermittently and therefore have a ‘fractional’ (Law, 2002) relationship with that object. UoAs are generally understood as analytical decisions rather than phenomena (i.e., maps, not territories). They are thus deployed pragmatically and flexibly, related to the research question one is trying to answer. They involve a bounding principle so that one can compare different cases, for example, business projects with the same criteria.

We acknowledge that our argument above might, initially, appear to have some affinities with the argument that Engeström (2008) has made about “co-configuration” and “knotworking” and the value of his UoA – the “activity system” – to research such forms of work. Due to these affinities, we have ourselves often used the activity system (as discussed below). But along with these affinities, we have found some far more significant differences in relation to projectification. To understand these, we discuss Engeström’s formulation and development of the activity system.

## Learning Between Bounded Work: the Activity System as a Unit of Analysis

Beginning in the 1980s, Engeström adopted or developed a set of related UoAs for understanding learning in human activity: Vygotsky's *mediated action*, Leontiev's *activity* (formulated by Engeström as the *activity system*, henceforth AS), Engeström's *activity network*, and Engeström and Sannino's *heterogeneous coalition* (Engeström & Sannino, 2021).<sup>1</sup> These UoAs are nested, with mediated action being the basis for the AS, which in turn is the basis for the activity network, and so on. Engeström argues that the AS is "the smallest and most simple unit that still preserves the essential unity and integrated quality behind *any* human activity" (Engeström, 1987, p. 97, our emphasis). In this system, three natural components (subject, object, community) are depicted as dialectically related through three mediational components (instruments, rules, division of labour). The AS is valuable because it captures the dynamics among these components.

The AS (Fig. 1) is anchored in the *object*, "the raw material or problem space at which the activity is directed" (Engeström & Sannino, 2021, p.8). The object is "what the activity is oriented toward", something that "is durable and constantly under construction" (p.5). As the activity's "true motive," the object "generates a perspective for possible actions within the activity" (p.5). In filling these roles, the object is understood as the same coherent object for different actors in the AS—that is, anyone involved in the activity is by definition oriented to the same relatively durable object, taking on the same basic perspective to address the same basic problem space, and the actors are understood as collaborating to address it. In one example, Engeström's research team was asked to diagnose problems in a surgical unit so they could develop "a holistic long-term solution" (Engeström, 2011, p.613). In another, the staff of housing unit "embarked on an effort to reorganize itself" in compliance with a national policy to combat homelessness (Engeström & Sannino, 2021, p.18).

The object is cyclically transformed (or "under construction," p.5) by *subjects* working within a *community*, and the relations among those three elements are mediated by *tools*, *rules*, and a *division of labor*; together, these elements form an essential unit of labour activity, allowing us to better understand the dynamics among these elements and the ongoing development of the system. This UoA and its modification, the *activity network* (constituted of interacting activity systems), anchored Engeström's work over much of the next two decades (e.g., Engeström, 1987, 2008, 2016).

In our previous work, we have found the AS to be a rewarding UoA for capturing the dynamics of work and learning in or between bounded work contexts such as institutions. The AS is a good match for such work contexts because it presumes a bounded system in which dynamically related components are oriented toward a

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<sup>1</sup> These are not the only UoAs on offer for activity theory. For instance, in addition to mediated action, Vygotsky used the UoA of *word meaning* for studying the relationship between thought and speech (Vygotsky, 2012). More recently, Blunden has proposed the *collaborative project*, which he characterizes as a further development of the activity system (Blunden, 2014, p.262), but anchored in people's motivations rather than social needs (Blunden, 2010, p.164).



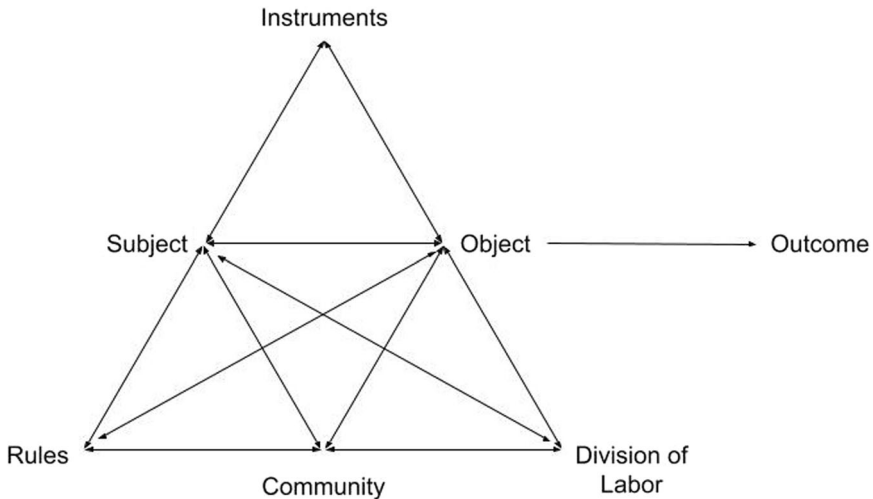


Fig. 1 The activity system (based on Engeström & Sannino, 2021)

shared object. Although the AS develops over time, it presumes a relatively stable relationship among a continually reconstructed object and subjects that continue to transform it — that is, a relatively stable set of subjects cyclically transform the work object as they collaborate to achieve a regular outcome. We see these expectations in Engeström’s interventionist research methodology, Change Laboratory, in which representative stakeholders (such as “Working practitioners and managers” of “a relatively independent pilot unit in a large organization” Engeström, 2011, p.612) are asked to take part in a series of meetings to collaboratively transform an institutionally recognized object. The transformed object synthesizes stakeholders’ perspectives, consolidating and generalizing a new practice that solves an institutional problem, as we saw in the examples of a surgical unit (Engeström, 2011) and a housing unit (Engeström & Sannino, 2021). For such institutionally grounded projects, the AS excels at capturing the dynamics of an existing workplace, driving discussion, and synthesizing institutionally acceptable solutions for that existing workplace. As Engeström and Sannino put it, the first step in the expansive learning process is “questioning the *existing* practice” (Engeström & Sannino, 2021, p. 10, our emphasis), a step that leads stakeholders to reconstruct the activity’s object to enable new and more acceptable outcomes for all.

Yet these conditions – an existing practice to be questioned, a stabilized division of labour to be rethought, a continuously involved community that can supply representative stakeholders, a new form of historic activity to be established – rarely obtain in projectified work. Perhaps most critically, the object itself is in the process of being formulated and deliberated by a fluctuating assemblage of actors; it is defined by its funding and the emerging (not assumed) collaboration across specialists and liaison with clients over the course of a given project. The relation between subject and object is contingently stabilized and there may be little agreement about it across actors. Finally, many of these vital actors disengage at the end of the process



rather than continuing to engage in the new practice, as is presumed in Engeström's cycle of expansive learning and in his Change Laboratory methodology.

As we (the authors) began to research projectification, we began to question whether the claims that the AS as "the smallest and most simple unit that still preserves the essential unity and integrated quality behind any human activity" (Engeström, 1987, p. 97) held in all contexts, while also wanting to retain the AS's focus on the object. One of us has explored how to modify the AS as a UoA to include actors working on more than one object simultaneously with fractional engagement (Spinuzzi, 2008, 2015, 2017), while the other has followed Nardi (2007), focusing instead on the way in which interprofessional teams commingle expertise and value to instantiate an object (Guile, 2012; Guile & Wilde: Expert division of labour and client-facing interprofessional project teams: forming 'situated judgement'?, forthcoming; Spinuzzi, 2005; Spinuzzi et al., 2018). Through these attempts, we realised that the AS's focus on a shared problem space struggled conceptually to capture the entrepreneurial activity required to procure funding for business projects, activity in which a shared problem space must be formulated and deliberated rather than understood as a starting point.

We are not the only ones to notice this difficulty: Engeström himself encountered similar problems when he and his colleagues broadened their scope of investigation in the late 1990s through the 2000s, (e.g., Engeström, 2008; cf. Daniels et al., 2010; Kerosuo & Toiviainen, 2011; Korpela & Kerosuo, 2014), including work across boundaries of ASes involving fluid temporary teams. One pivotal example was that of how unaffiliated people temporarily coordinated to aid a mental patient (Engeström et al., 1999). This case did not obviously fit into an AS, since it did not involve a cyclical transformation of a long-lasting object, nor a stabilized set of stakeholders who continue their relationship through a sustained engagement with such an object. To explain this case, the authors developed the concept of *knotworking*: a new form of work that enables the synthesis of different perspectives and activities seen in co-configuration work. Engeström defined knotworking as:

not reducible to a single knot, or episode. It is a temporal and spatial trajectory of successive task-oriented combinations of people and artifacts. Knotworking situations are fragile because they rely on fast accomplishment of intersubjective understanding, distributed control and coordinated actions between actors who otherwise have relatively little to do with each other (Engeström, 2004, p. 155).

Knotworking has been applied by Engeström and other researchers in various ways (see inter alia. Engeström, 2008, 2016, 2018; Daniels et al., 2010; Kaatrakoski & Lahikainen, 2016). Strikingly, such knotworking cases also tended to be anchored in bounded institutional contexts (hospitals, courts, social work and care) with an agreed-upon object of activity and where the funding for that activity already exists.

Yet knotworking and other theoretical elaborations could only do so much. In 2009, Engeström questioned whether the AS is appropriate for the challenging cases of social and peer production: "Third-generation activity theory still treats activity systems as reasonably well-bounded, although interlocking and

networked, structured units. What goes on between activity systems is processes, such as the flow of rules from management to workers” but “In social production and peer production, the boundaries and structures of activity systems *seem* to fade away” (Engeström, 2009, p.309, our emphasis). But, he argued, such cases can still be analysed with ASes, since “social production requires and generates bounded hubs of concentrated coordination efforts” and “activity system models are very appropriate for the analysis of such hubs” (p.310). To make this argument, Engeström drew on theoretical concepts such as *mycorrhizae*, which postulates hidden formations that coordinate historically separate, bounded activities (Engeström et al., 2010, p.8). This postulated hidden structure reinforces boundaries within which, and across which, vocational learning happens — an underlying boundary structure beneath these seemingly unbound, unstructured activities (see *inter alia*. Kaatrakoski & Lahikainen, 2016; Kerosuo & Toiviainen, 2011; Korpela & Kerosuo, 2014). This postulated structure shores up the activity system as a UoA that, once again, can be applied to all work.

But such boundaries, even postulated ones, are far less firm in project work, which involves temporary arrangements of specialists, often working across organizations and disciplines, and temporary funding sources. Despite its considerable strengths, the AS does not capture two important dynamic relationships seen in project work:

1. The relationship between funding and forms of working and learning, and
2. The implications of the extended temporal dimension of much temporary forms of work for learning.

What is needed therefore is a UoA to address these dynamic relationships to account for vocational learning under these conditions, conditions that involve different learning arrangements and learning practices. It must do this without presupposing boundaries that, although they “*seem* to fade away” (Engeström 2009, p.309, our emphasis), are reinscribed through hidden underlying structures such as *mycorrhizae*.

This is not to say that we seek to supplant or invalidate the UoA of the activity system. Engeström and colleagues have continued to use the AS when exploring alternatives to capitalism (Engeström et al., 2016; Engeström & Sannino, 2016, 2021; Yamazumi, 2020) in service of a *post-market society* (see Acquier et al., 2017). We applaud these efforts. Yet much work still takes place in market settings — settings that still involve vocational learning, and that are still critical to study. And just as Engeström and Sannino (2021) argue that post-market society requires a new UoA with qualities specific to it (their *heterogeneous coalition*), we argue that post-bureaucratic settings require a different UoA customized for them.

### **A Unit of Analysis for Learning in Projectified Work: the Project Assemblage**

To develop this UoA, we draw on insights from actor-network theory (ANT) and cultural sociology, including empirical evidence from our own research. We call the

result the *project assemblage*. In this regard, we follow and differ from Säljö (2009, p. 209): we agree UoAs involve choices to conceptualise a phenomenon that “corresponds to a theoretical perspective or framework” but we extend this to include inter-theoretical frameworks.

To set the scene for this new UoA, we start this section by discussing the relationship between the concepts of project and activity. We explain our position through recourse to work in ANT and cultural sociology that we have found in our separate work offering helpful resources to capture the working and learning dynamics associated with projectification. We firstly explain why this work is helpful in conceptualising the new UoA, and then we illustrate the possible application of this new UoA through reference to two case studies of our previous research.

### Theoretical Base: Insights from ANT and Cultural Sociology

Our concept of project, although emanating from the projectification literature, is influenced by two other theoretical traditions. The first is ANT and specifically Law’s books *Aircraft Stories* (2002) and *After Method* (2004). On first impression, the purpose of the first book appears to be an account of the emergence and development of a specific project – a new aircraft. Yet Law has a much more ambitious goal: He uses this project as a resource to “*think past the limits that [modernism and postmodernism] set to our ways of thinking*” (Law, 2002, p. 1). Law pursues this aim by introducing the concept of “*fractional coherence*” (italicization in original). This concept represents, for Law, the interpolation of modernist and postmodernist thinking since it denotes “*drawing things together without centring them*” (Law, 2002, p. 2). Fractional coherence has therefore some affinities with the AT concept of object since it acknowledges that there is a purpose underpinning a project, but it is also different. Like other ANT colleagues (e.g., Callon, 1986; Latour, 2006; Mol, 2002), Law is concerned to include social practices and objects, in the sense of extant and new artifacts, in his conception of a project. To establish this balance, Law draws a parallel between the consensus in the human sciences since the 1960s that “knowing subjects” are “assemblages” of “actions, emotion and desires”, and “also objects” (Law, 2002, p.2). Objects, for Law, are therefore assemblages of “multiples”, for example, technical design, specific features, social and/or political purpose and therefore have “no single centre” (Law, 2002, p.3). Thus, Law asserts, the performances of the multiple actors involved in a project “make objects that cohere” (Law, 2002, p.3) as they make connections between continuity and discontinuity and, simultaneously, address the “tensions that are made in the process of centring” (Law, 2002, p. 112). The resulting project object (i.e., the purpose and outcome) is therefore fractional: coherent enough to anchor collaborative activity, yet incoherent enough that it can provide traction to the different specializations attempting to transform it (cf. Mol, 2002 on multiplicity). Law offers therefore a way to acknowledge and investigate the ontological and intermittent dimensions of project work within the context of a mega (Flyvbjerg, 2012) or more circumscribed project. In presenting project teams as “assemblages”, put together along with technological resources on a temporary basis to accomplish a given outcome, this approach

thus offers a helpful way to understand not only “project complexities” (Hertel & Orlikowski, 2015; Sage et al., 2011), but also the forms of vocational working and learning associated with such complexities. We therefore follow Law and see projects as the assemblage of heterogeneous socio-material activity that lack a single centre and, as such, projects are typically unique “and non-repetitive efforts” rather than “historical formulations in which the object is cyclically transformed to address a motive” (Engeström, 2008, p.256).

The second theoretical tradition is cultural sociology and specifically Boltanski and Thevénot’s “conceptions of worth” (2006). Boltanski and Thevénot argue that: (a) human interactions rely on different forms of justification; (b) there are always different conceptions of worth or value (aesthetic, financial, technical) playing out in any situation, especially in project teams; (c) it is inevitable that different types of justifications which reflect these different conceptions of worth, ultimately, have to be reconciled with one another; and (d) therefore the challenge for these actors is to learn how to reconcile those competing conceptions of value. Hence, Boltanski and Thevénot shed different light on Law’s argument that performances of the multiple actors involved in a project make objects that cohere. They implicitly retain his argument about fractional coherence but make the communicative or dialogic dimension of the justificatory, or in Law’s terms cohering, process of working in project teams, much more explicit.

This, however, begs the question – how are such assemblages assembled? We noted above that the type of projects we are particularly concerned with – business projects – only exist because either a client has issued a tender to contract a ‘team’ most frequently drawn from members of different organizations to accomplish the tender specifications, or an entrepreneur has through their discontinuity and, simultaneously, address the “tensions that are made in the process of centring” (Law, 2002, p. 112). The resulting project object (purpose and outcome) is therefore fractional: coherent enough to anchor collaborative activity, yet incoherent enough to be tractable to the different specializations contributing to that collaborative activity.

The concept of “assemblage”, for Law (2002, p.2) encapsulated the recursive process of putting together the human, financial and technological resources to build any project team (the term *project* denoting the temporality of this heterogeneous, fluctuating team) – in his case a new aircraft. We feel that in addition to establishing the overall membership of a project team (with its sporadic, interleaved dialogues among transitional members belonging to different disciplines), the concept also can be deployed to capture how members work and learn in changing combinations or permutations throughout the duration of a project as they come in-and-out to make contributions to deliver the outcome stipulated in a tender (i.e., the object of the activity they are contracted and funded to accomplish). Our argument is that in learning-in-projectification, people learn in these unique, non-repetitive efforts to address their fractional objects as they form and sustain the project assemblage they belong to (as we illustrate in the next section). Our definition therefore provides the field of vocational learning as well as cognate fields such as professional and workplace learning with a way to take account of the entrepreneurial, fractional contingent dimensions of projectification, when investigating working and learning in this type of context (Guile & Wilde: Expert division of labour and client-facing

interprofessional project teams: forming 'situated judgement'?, forthcoming; Guile & Lahiff, 2017).

The *project assemblage* is how we conceive this new UoA, which allows us to analyze why and how a project, its object of activity and the team working on it and learning through their fractional engagement with one another, emerges. The project therefore becomes our UoA, bounded by the actors and mediators that engage in dialogic negotiations to enact its fractional object. Such negotiations happen throughout the life of the project, as actors and mediators enter into, negotiate about and collaborate on, and exit the project at different times, stabilizing and transforming the fractional object at different points. This ebb and flow or modulation engenders fractional working and learning dynamics that we propose are best captured by examining specific stages of project assemblage. We propose two stages:

1. The dialogic cycle of cohering the fractional object: Emergence, assembly, and proliferation.
2. The sufficient coherence of the fractional object, leading to the dispersal of the assembly of actors.

We firstly explain the above two stages of project assemblage and then exemplify them and the conjoined forms of working and learning by providing two case summaries of the type of business projects we have researched, identifying the centrality of entrepreneurial and fractural activity in business projects as well as the implications of concomitant activity and resolution of competing values of worth for interprofessional working and learning.

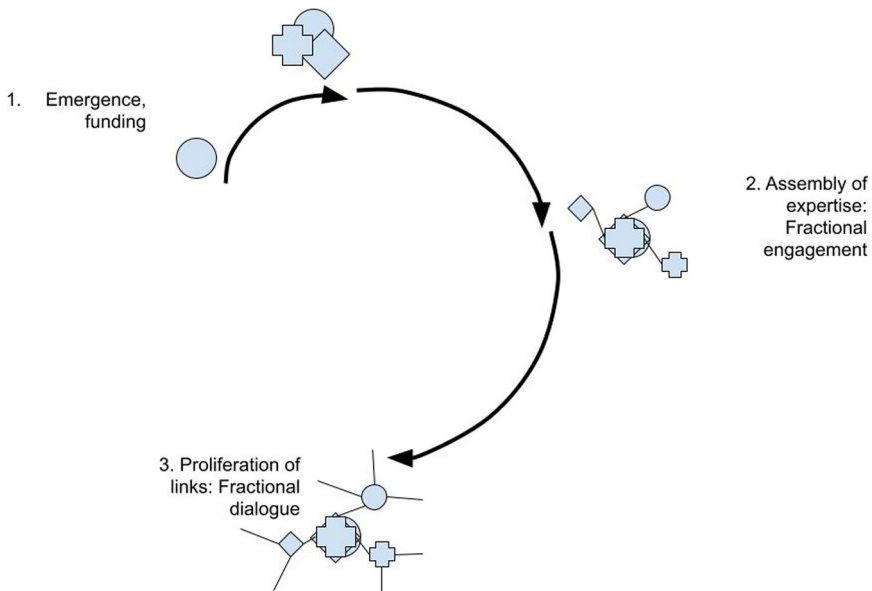
### The Dialogic Cycle of Cohering a Fractional Object

Projects, like all forms of human activity (Blunden, 2010), are defined by human motivation and have different kinds of outcomes – new objects, refashioned objects and so forth. What is distinctive about the type of project that we are focusing on is that they presuppose an entrepreneurial dimension — they require funding, either private or public — and consequently there is a dialogic interplay between the formulation of the object a project will realise and the funding to facilitate it. This dialogic interplay emerges as different kinds of aspirations, expertise and motivations, applied to an emergent but relatively coherent shared, but developing, fractional object, are tested out among a variety of actors. Inevitably, tensions will arise among the different specialists and the client or funder, collaborating at different points as they project onto the object different conceptions of what they want to accomplish, often with varying commitments. This projectified object serves therefore as a *sense integrator* (Spinuzzi, 2017) that comes to unite participants' different conceptions of worth as it is dialogically transformed to satisfy the diverse motivations and other work in which its participants are enmeshed. The outcome of this process is a shared project and its object and, as such, constitutes the first stage in achieving relative coherence as an "assemblage" (Law, 2002).

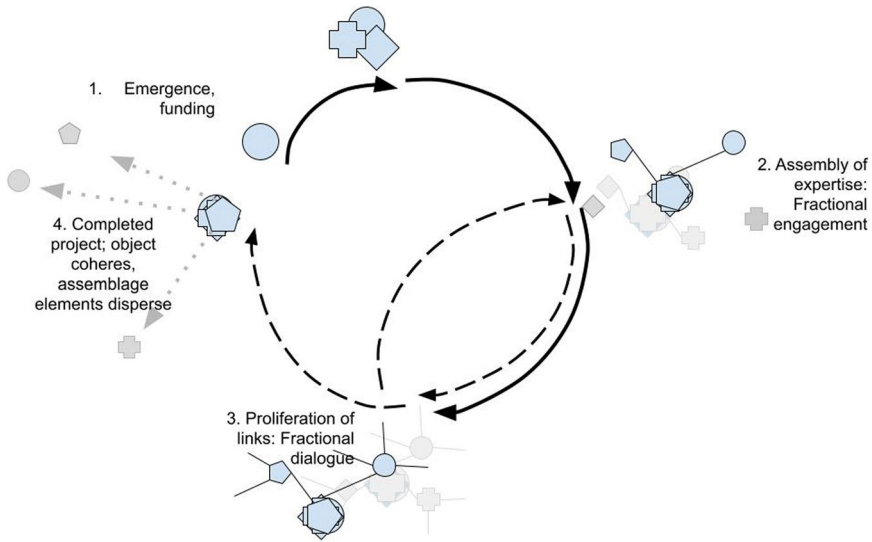
In the cases we have investigated, such assemblages form around the potential for funding, a potential that can only be realised through (1) an emerging project that draws on diverse specializations and actors with a successful track record, resulting in (2) an assemblage of expertise: a process in which actors are brought into contact to address the funding opportunity – a tender issued by a private or public sector organization (i.e., an established contractual obligation) or a pitch to a philanthropic funder (i.e., an emerging opportunity to establish a contractual obligation), often in phases. In these phases, (3) each specialist contributes based on their own specialty, proliferating links for the project and passing the baton as they complete their contributions (See Fig. 2).

In this figure, the shapes represent actors' fractional understandings of the project's object based on their different specializations. These understandings must be made relatively coherent for the project's fractional object to be realised.

In this cycle, each specialist understands the project's fractional object in terms of their own specialty, meaning that the object is only relatively coherent—but it becomes more coherent as these efforts are meshed, often repeatedly drawing in different expertise. During this process, the working and learning dynamics criss-cross actors who can be (1) fully involved throughout a project, (2) fully engaged in a stage of development within a project, (3) intermittently engaged throughout a project. This mixed pattern of fractional engagement positions actors to make situated judgments to resolve project-specific issues and then to pass the baton on to the next mix of actors to take things forward. This pattern of working enables the project object to become sufficiently coherent, (4) the project or a stage in the project is completed and the assemblage or elements of it disperse (Fig. 3.)



**Fig. 2** The dialogic cycle of cohering the fractional object: Emergence, assembly, and proliferation



**Fig. 3** The dialogic cycle continues until the fractional object coheres sufficiently, at which point the assembly of actors disperses

To illustrate this dialogical cycle as an account of learning-in-projectification, we offer two cases: entrepreneurship, which is a classic ‘school-based’ example of vocational learning involving emerging contractual obligations, and client-facing interprofessional project teams, a classic example of vocational learning in the ‘wild’ which involve an established contractual obligation, and use our new UoA to make more explicit issues that were either left implicit or even unaddressed in the previously published work.

### The Case of Entrepreneurship

One of us has been interested in different forms of entrepreneurial activity for some time, and had drawn from ANT to better understand cases of project-based working and learning associated with that type of activity. These cases include coworking (Spinuzzi, 2015), subcontractor networks (Spinuzzi, 2015), and early-stage technology startups (e.g., Spinuzzi, 2017). In these cases, we can identify a specific object (such as coworking, a contracted project, or a value proposition for a new product) that is being codeveloped by a loosely related coalition of actors who engage in dialogue as they intermittently cycle in and out of the project. These actors understand and transform the shared object based on their own specializations. Furthermore, they may engage and disengage at different times rather than consistently and continuously engaging with the object.

For instance, consider a technology startup that one of us first encountered in a 9-week entrepreneurship accelerator program (Spinuzzi et al., 2018). Such programs are set up to help early-stage startups to learn how to develop a business around their



technological innovation. This particular startup had developed a motion-controlled shower adaptor to reduce and analyze water waste. Its founder, a computer engineer with an interest in microcontrollers and with no formal business training, had initially conceived of the device as a way to save water and energy, so he explored possible buyers such as apartment complexes, university dormitories, and hotels. As he began talking to hotel managers, he learned that they had a more pressing problem: guests frequently left hot showers on in order to steam their clothes—sometimes for hours, sometimes all night long. These long shower events created significant problems such as mold and leaks. The resulting remediation expenses dwarfed the expenses of water and energy that the startup had initially addressed, and according to the hotel managers, these remediation expenses were a more pressing problem to solve. Thus, through these customer discovery interviews, the hotel managers temporarily cooperated with the founder to transform his startup.

In the accelerator program, the founder attended several workshops on aspects of entrepreneurship and met with a handful of mentors assigned by the program. This was only one of many such learning engagements he attended, including other accelerator programs but also forums, investor pitches, grant programs, and pilot studies. He later added two founders with different specializations and, over time, engaged with contractors, partners, suppliers, potential investors, potential customers, consultants, and many others to develop his startup (a term we'll use here to encompass the interdependent combination of technology, value proposition, and business model). He and his co-founders had to make, revisit, and remake a range of decisions, from their target market (budget hotels? boutique hotels? other institutions?) to their problem (water and energy waste? water damage to units?) to hardware (an embedded lithium-ion battery with a small turbine generator? removable batteries?) to design (a showerhead? an adaptor that fits between the pipe and the existing showerhead?) to the promises they could make (could they rely on an existing, older study to quantify average water waste? Would their pilot studies validate this study or undermine it?).

Each decision was informed by dialogue with a range of actors, including potential customers, investors, funders, and contractors (Fig. 2, steps 2–3). This dialogue was cooperative rather than collaborative, in other words, working with others to produce something together and achieve shared goals: For instance, an investor is cooperating even when they decline to invest, because their explanation for declining to invest is still dialogue, and can still impact how founders make future decisions. Furthermore, actors of different specializations engaged intermittently rather than continuously. Some, such as the mentors in the accelerator program, engaged only for 9 weeks and never again; others engaged periodically through long stretches of the startup's life. (And although the original founder was continuously engaged throughout *this* project, in some startups, even the founders cycle in and out, leaving none of the original team in place by the time the product is brought to market.) Because the startup was co-created through this ongoing dialogue with intermittent partners, it was necessarily *emergent*, incrementally revised to address tensions across these actors' needs and desires.

Critically, this process involved projectified learning across the range of actors as they engaged intermittently. The original founder had to learn enough about the

potential markets to competently refine the technology to address their problems and contingencies (or, sometimes, to conclude that the technology was not right for this specific market, and thus to stop engaging with it and seek another one). He had to learn how to work with contractors whose specializations were orthogonal to his; to understand what investors sought and to determine whether his startup could supply it; to understand how much he could change his technology in order to meet goals that research funders sought to achieve. Similarly, these intermittent actors also learn about his startup every time he pitches, submits a grant proposal, conducts an on-site pilot study, engages with assigned mentors, or meets with contractors he has hired. In short, the startup and its technology resulted from projectified learning, enacted through intermittent dialogue across these different actors.

This projectified object therefore draws a range of actors into intermittent dialogue about it: these actors engage and disengage at different points, in different occasions such as funding rounds, investor and customer pitches, and pilot studies (Fig. 3, steps 2–3). At some point, the fractional object will perhaps be stabilized enough for the assembly of actors to disperse while the venture enters the execution phase (Fig. 3, step 4): the founder and a set of chosen partners will produce a specific, relatively coherent technology (or as Latour would say, a black box) that appeals to and can be reliably deployed in a specific market, generating enough returns through a stabilized business model that the startup can sustain itself through revenue rather than continuing funding rounds. At this point, many of the intermittent actors can disperse: the venture can rely on revenue rather than investor rounds and research funding, can hire permanent employees instead of temporary contractors, and can turn pilot studies into long-term contracts that guarantee stable revenue. Meanwhile, mentors, investors, contractors, and managers of boutique hotels will go on to other opportunities, perhaps applying what they have learned to future projects.

### **The Case of Client-Facing Interprofessional Project Teams**

In contrast, one of us has investigated interprofessional project-based working and learning in professional service, or consulting, firms (Empson et al., 2015) and has drawn on cultural sociology to better understand cases of project-based working and learning associated with that type of activity. Professional service firms “specialize in offering their expertise to other firms or conglomerations of financiers and firms” (Von Nordenflycht, 2010, 157) and are, therefore, positioned to “compete for contracts from clients”, by tendering for new work or identifying ways to either secure “repeat contracts” (Maister, 1993, 5); both outcomes enhance their reputation and enable them to secure contracts from new clients.

The outcome of the contracting process is assembly of expertise, in this case, a “client-facing interprofessional project team” (C-fIPPT) (Guile and Wilde: Expert division of labour and client-facing interprofessional project teams: forming ‘situated judgement’?, forthcoming), which may in general consist of representatives from a number of professional service firms depending on the scale and scope and risk of the project, working on an emerging object. Emerge, as with the entrepreneurship example, in that it is, on the one hand, possible to identify a generic

outcome (such as a new or re-designed building; see Fig. 2, step 1) that is being codeveloped by a loosely related CfIPPT. On the other hand, actors who are positioned to liaise with clients and quite likely to be concurrently working on different projects will understand and transform the object based on their own specializations as they work and learn with different members of the project team (see Fig. 2, steps 2–3). They have therefore, as with the entrepreneurship example, fractional commitment and engagement with the object.

In the case of construction projects, once a tender has been procured and a project team assembled, they then have to bring things together by transforming the generic object stipulated in the tender, for example, re-design a historic building into a “Plan of Work” (PoW) and the “scope” (Guile and Wilde: Expert division of labour and client-facing interprofessional project teams: forming ‘situated judgement’?, forthcoming). The first outlines the phases and stages of work and allocates coordination responsibilities based on the identification of responsibility for signing off different stages of the project team’s activity (e.g., architectural, lead; structural engineer, lead; mechanical engineer, lead; interior design) and firm-specific project management oversight (e.g., progress re milestones and budgetary monitoring). The second is a detailed specification of the work to be undertaken by the CfIPPT working on each stage of the PoW to ensure the right mix of expertise has been allocated in relation to the anticipated sequence of work. The realization of the scope is therefore, as with the entrepreneurship case, an emergent co-created object since it is also co-created through varying interests and undertaken by members of the project team. Since members of CfIPPTs come in-and-out of project teams meetings and work cooperatively with one another in different combinations, they have to learn afresh in each project team how to resolve dilemmas with the scope. One common strategy is how to a) listen to new colleagues presentations or concerns and ask questions to clarify understanding b) learn through that listening process how to put forward alternative suggestions based on alternative conceptions of worth (i.e. trade-off between aesthetic and financial considerations) and c) learn from matching the scope to the ongoing discussions how to anticipate the implications for the work of other actors who are not present, because this cross-section of the overall project team will have to pass on the baton to them at some point in the scope before picking it up again themselves. For example, a cross-section of a team encountered a problem that could have compromised the aesthetic integrity of the re-design of a building. Using digital displays depicting the building from different angles, memories from site visits and extensive deliberations about the extent to which aesthetic or financial considerations should determine the solution to the identified problem, the cross-section of the team eventually found a solution by “capturing an externality.” By this we mean, some actors heard the basis for a possible solution in ideas that were being tossed back-and-forth between team members (Guile & Lahifv, 2017). They learnt therefore from their intermittent contributions to these concomitant conversations how to engage at specific points rather than continuously (Fig. 3, steps 2–3) until the part of the project they were working on was completed (Fig. 3, step 4). The outcome of this projectified working and learning process is the development of a “fractional ontology”, that is, knowing how to deploy expertise in relation to phase of work and combination of actors (Guile & Lahifv, 2017).

This commingling of expertise, resources and budget into the scope inevitably reflects different conceptions of worth or value (aesthetic, technical, financial) that are held by actors in the project team. Their challenge therefore is to learn afresh as they move from project-to-project to operate in one of two main ways: to participate in discussions to commingle aesthetic, financial, technical and health and safety legal obligations contingently and cooperatively so a scope can be transformed in modest ways to respond to client feedback, for example, listening to care home managers concerns about potential isolation in the design of a new building and varying the design to create more social space (Guile, 2012); and, to use ideas and suggestions that may have generated surfaced from observations passed by other actors in their discussions as a “trading good” (Guile, 2012, p. 320) to facilitate innovation. One example being members of a project team learning to develop the confidence to participate in several rounds of thinking aloud and hand sketching on paper the implications of their discussions from different perspectives, to identify a solution to a problem (Guile & Wilde, 2023). The object of the project is therefore contingent, unfinalized: actors are, on the one hand, working with one another but with very different conceptions of worth or value, influencing their engagement with, and development of, that object through the life of the project team (Guile and Wilde: Expert division of labour and client-facing interprofessional project teams: forming ‘situated judgement’?, forthcoming, p. 194). And, on the other hand, frequently working simultaneously on *other projects* with their own objects and very different timelines (Spinuzzi et al., 2018; Spinuzzi, 2015).

By focusing on emergence and assembly, both cases reveals issues about vocational working and learning that have rarely been discussed in the field of VL. In these cases, projects cluster around an emergent, ontologically indeterminate object. The different actors do not agree on the object’s ontological limits or the conceptions of worth that influence how they engage with it. Thus they conceive of it, leverage it, and understand it in different ways. In uniting around the shared, emergent object, actors in otherwise unaffiliated activities learn to define each others’ emergent roles as they work together to transform the projectified object to mutually address their separate motives. The projectified object is coherent enough to anchor cooperative activity, yet incoherent enough that it can provide traction to the different actors attempting to transform it in line with their own specializations. These actors must learn enough about the relevant specializations that they can orchestrate and manage the process of cohering the object, and they may borrow expertise from the otherwise separate projects in which they are simultaneously engaged.

## **Conclusion: Challenges and Opportunities for the Project Assemblage Unit of Analysis**

In the cases of entrepreneurship and CfIPs explored above, we explore project assemblages and their associated form of vocational learning that are:

1. *Made up of different actors working across organizations without regard to boundaries.* Actors' understandings of the object do not closely cohere: Different actors might enact the object differently, projecting different developmental pathways and thus requiring different plans, coordination efforts, and partners. Part of their vocational learning involves learning enough about the other vocations to cooperate effectively on the fractional object. Thus no single institutional view of the object is inevitable or desirable.
2. *Discontinuous and unstable:* with members rotating on and off at different points, this assemblage changes throughout the project. Thus, actors' enactments of the object are sometimes sequenced, and their vocational orientations are thus sequentially layered (contingently and cooperatively in the fractional object). The assemblage is not durable in the long term: the building is eventually completed, the entrepreneurial pitch eventually gives way to a marketed product, and the assembly disperses (Fig. 3).
3. *Enacted differently by different actors:* since actors represent different vocations (and disciplines, and specializations), they not only perceive the object differently, they *enact* it differently (Mol, 2002), learning how to "recontextualize" (Guile & Wilde, 2018) their vocationally oriented knowledge, tools, concepts, and processes to it, and in doing so, they may not bound this object in the same way. Their enactments do not necessarily cohere.
4. *Unsettled:* Since the assemblage disperses at the end of the project, the object is not reliably cycled over time by the same assemblage. A relatively durable, shared enactment or pattern of activity is not necessarily developed for future cycles; the project's object, like Law's aircraft, is only relatively coherent.

In these cases, and many others, actors' intermittent engagement with objects involves the forms of fractional working and learning that we have identified which are associated with project assemblages, i.e., learning-in-projectification, for example, customer discovery-interviews, capturing externalities, that hitherto have not been discussed in the fields of vocational and professional learning. Actors simultaneously contribute to different phases of projectified work in different projects, learning how to attend to different conceptions of worth, and using emerging ideas or suggestions as trading goods to dialogically renegotiate each project's object as it becomes relatively more coherent. Their projectified object is necessary ontologically indeterminate rather than ontologically settled. Thus cross-vocational dialogue about this object is crucial to the *centring process* (Law, 2002). Yet this process is frequently incomplete, requiring additional vocational expertise to be brought in through proliferating links with experts entering and exiting the assemblage as they address parts of the emerging project (Fig. 3, steps 2–3). Through this dialogical comingling of expertise, the project assemblage learns how to reconcile competing considerations (Fig. 3, step 4). The project assemblage requires vocational learning that is dialogical (drawing meaning through difference) rather than dialectical (drawing meaning through an emerging unity), a fact reflected in the projectified object's fractionality, its relative coherence.

It is this question of vocational learning that we've attempted to address in this paper. How do we study vocational learning-in-projectification, and what UoA can help us to address this specific question? The resulting UoA, which owes a debt especially to the important work of activity theorists, actor-network theorists, and cultural sociologists, can be viewed as a practical exemplification of, what Hacking (2002) refers to as, “historical ontology.” He invokes this term to refer to the “objects or their effects that do not exist in any recognizable form until they are objects of scientific study”, and that this presupposes the interplay between disciplinary concepts and social practices (Hacking, 2002 p. 11). In contrast, we have given this term a practical twist. We use it to refer to the way in which members of project teams draw on one another's specialist practices to stabilize a barely coherent object, so it becomes more coherent as these dialogical efforts are meshed, often repeatedly drawing in different expertise. Our UoA can therefore be used to reveal the phases of the assemblage of a project with a projectified object and project team to enact that object as well as their associated fractional forms of working and learning.

Although projectification is characterized by objects, these objects emerge through actors projecting their different conceptions onto the object. This process is enacted by interprofessional project teams and entrepreneurs and their partners and co-workers (instead of collaborators?) and enacted via concurrent and contingent activity. Thus, to analyse the fractional vocational working and learning associated with projectification, we proposed project assemblage as a UoA. Project assemblage allows us to investigate the incoherencies seen in our two case studies and beyond— incoherencies that might otherwise remain unobserved or be interpreted as contradictions to be addressed.

In the discussion above, our conception of a UoA is consistent with how that concept is understood in ANT, cultural sociology and sociocultural theory – and in qualitative case study methodology more generally (e.g., Bernard, 2002; Creswell, 2006; Yin, 2003) – where UoAs are generally understood as analytical decisions rather than phenomena (i.e., maps, not territories). Thus, UoAs are deployed pragmatically and flexibly to answer specific research questions. They involve a bounding principle so that one can compare different cases, for example, business projects with the same criteria. Put another way, such UoAs are suited to understanding phenomena ontologically because they do not assume eventual agreement about a unified phenomenon of which actors have differing perspectives. And this is how we apply our UoA: as an analytical decision, bounding the case with the principle of the emerging project. *What coheres?* That is, in an essentially contingent project, on what do the participants agree sufficiently to take joint action? How do they enact this project through their collaborative efforts? Under what conditions do all relevant participants understand it to have been cohered enough that they can disperse, turning to other projects?

Drawing such case boundaries can be *messy*, as Law (2004) argues. But, we contend, this “mess” is necessary in such cases of projectification, in which a single validated perspective is unenforceable, in which multidisciplinary adhoc teams bring their separate expertise to bear on an object of the joint effort emerging within a project, with different disciplinary enactments, as part of a temporary assemblage of actors that disperses at the project's end. As we saw in the cases, this projectified object coheres through dialogue—open-ended, unresolved dialogue that is radically

different from the type of discursive, dialectical exploration we see in Engeströmian activity theory (e.g., Engeström & Sannino, 2010, 2011), boundary crossing (Akkerman & Bakker, 2011a), personal agency (Billet, 2006) or common knowledge (Edwards, 2010). We see this paper as the first step toward realising this UoA, a UoA that will need to be explored and developed further through deployment in future studies of vocational learning.

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## Declarations

**Competing Interests** There are no financial or non-financial interests that are directly or indirectly related to the work submitted for publication, pertaining to either author.

The article was co-conceptualised and jointly written by both authors. The conceptual part of the argument did not require ethical clearance and the case study data which was derived from previously funded and published work had received ethical clearance from our respective university's Ethical Committees.

Data sharing not applicable to this article as no datasets were generated or analysed during the current study.

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