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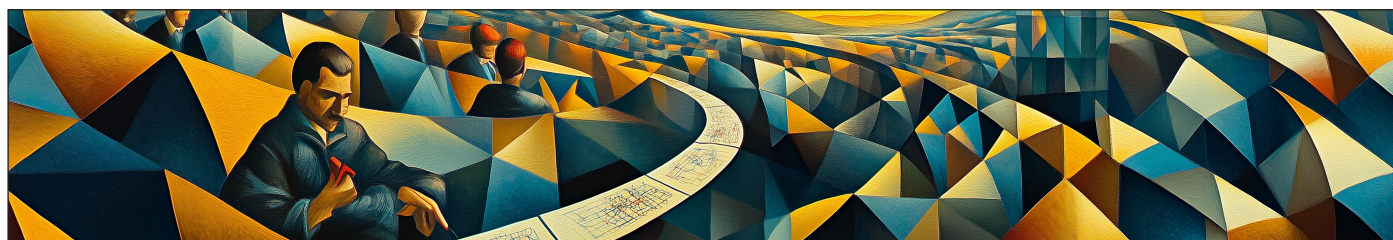
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Examining agentic actions: University teachers learning to embrace digital change

Meg Colasante

College of Business and Law, RMIT University, Melbourne, Australia

Keywords

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Abstract

Universities have progressively sought to grow their digital learning options for students, using various institutional change processes to encourage (or direct) university teachers to adopt technologies into their teaching practices. Nevertheless, systemic level cultural change can be difficult to achieve in meaningful and sustainable ways. In an Australian university, an organisational change project sought digitalisation of teaching at scale, by directing replacement of traditional lectures with digital options. Ethnographic fieldwork – as the first phase of an activity theory project – reveals how a community of anatomy teachers experienced various conflicts during this change process yet learnt themselves how to co-construct and transform their digital teaching practice. Accordingly, this paper positions teachers as learners in their university workplace and focuses on their agentic actions as they evolve their practice. Occurring over multiple cycles of activity transformation, teacher actions ventured beyond the required change of teaching tool, to build their digital teaching capabilities including designing their own pedagogical models and developing digital technology skills. Some further actions that the teachers took to gain control, namely efficient video production and quality assurance, evolved into system stabilising auxiliary activities which formed ongoing sustaining mechanisms for their digital teaching activity. Field data analysis utilised two activity-theoretical conceptual notions of actions, that of the hierarchical positioning of actions compared to activities,

and progressive actions within transformative agency double stimulation (TADS). Analysis also depended upon authentic tracking of the object across historical, transitional, and emerging forms of the teachers' activity. The anatomy teachers use of agentic actions for changing practice using well-established tools such as video technology has potential implications for improving academic/faculty development in other technology-enhanced learning practices, for example, teacher-agentic approaches to incorporating more complex emerging technologies such as generative AI into teaching activities.

1. Introduction

Universities, like all contemporary workplaces, function within increasingly digitalised contexts. Beyond the recent pandemic which accelerated online learning, university management have long faced various external pressures and incentives to digitalise, from government, technology vendors, and a globally competitive environment (Selwyn, 2007). Cascading expectations onto teachers to adopt technology occurs, despite teachers not necessarily being included in decision-making on technological tool choice (Gorrell, 2023). Increased technology, on one hand, has critically led to "more efficient, expedient and/or expensive forms of traditional education provision" (Selwyn, 2017, p. 31). On the other hand, technology offers benefits to university students, such as development of digital skills required for eventual workforce participation (Bowles & Kaviani, 2023), and access to learning when life circumstances inhibit on-campus attendance (Colasante, Bevacqua, & Muir, 2020).

Successful adoption of technology-enhanced learning in higher education is dependent upon teacher (and subsequently student) buy-in (Hollands & Escueta, 2020). Teachers, who demonstrated their agility to adopt digital tools as a matter of urgency during the Covid-19 pandemic to accommodate emergency remote teaching (Ebardo & Suarez, 2023), proved crises as "times of involuntary transformation" (Mascolo, 2020, p. 19). The change was necessary to meet immediate, transient needs where university teachers learnt quickly to adapt to online teaching, and where digital tools proved essential. Nevertheless, some practice responses were rudimentary, such as "running three-hour Zoom lectures" (Chik & Benson, 2021, p. 2), illustrating attempts to speedily mediate a traditional culture of teaching through a digital context. Improvements to practice might be realised via "a more sophisticated approach to pedagogy" beyond "teacher-centric instruction" (Rizvi, 2020, p. 33) and a more sophisticated approach to change (Hamadi & El-Den, 2024). These adoption factors continue

to be relevant, with ongoing opportunities or challenges on the horizon in technology-enhanced learning such as ever-increasing roles for established tools such as video (Colasante, 2022) or introducing relatively new tools into teaching such as generative artificial intelligence (GenAI) which universities cannot avoid (Hartley et al., 2024).

The Australian host university in this study, the pseudonymous *Elizabeth Normian University* (ENU), proved to be no exception as an increasingly digitalised workplace. At this mid-sized, multi-campus university, a centrally led digitalisation project caused disruption across several teaching disciplines by stipulating discontinuation of the traditional university activity of live lecturing for replacement with asynchronous digital teaching. The project promoted a standardised model of *blended learning* comprising online lecture-replacement content (principally via teacher-created video) plus on-campus non-lecture learning experiences (on-campus tutorials and/or laboratories). Blended learning, an approach adopted by many universities to increase technology in teaching (Bowles & Kaviani, 2023), involves redesigning on-campus teaching to purposefully comprise on-campus and online modes of learning (Douglas, Lang, & Colasante, 2014). A recent shift in terminology towards *hybrid learning* signals emergence of more sophisticated models (Colasante, Bevacqua, & Muir, 2020; Tierney, Hopwood, & Davies, 2024). A good blend, regardless of title, requires time and resources to achieve intentional pedagogical layering and interdependency between the modes (Glazer, 2012).

1.1 The activity theory project

Through the conceptual and methodological lens of activity theory, this paper follows the experiences of a team of anatomy teachers who, in response to the ENU digitalisation project advocating a standardised blended learning model, changed their lecture-centric practice to incorporate digital teaching. After first changing their large first-year subjects under duress, they then learnt how to improve their practice through volunteering their second-year subjects.

The primary participants are the teacher-coordinators (lead teachers) of two second-year undergraduate subjects (courses/units/modules). These anatomy subjects, with approximately 200 students in each, are recoded as *Human Anatomy (U2HA)* and *Anatomy of the Limbs (U2AL)*. The study explores the anatomy teachers' practices and how they construct, re-construct and transform their activity of digital teaching within the cultural-historical contexts of a university workplace that is simultaneously becoming increasingly digitalised. The teachers' labour is under examination, how

it has been disrupted, and how they interact as a social, collegiate community to learn to address these disruptions and ultimately transform their activity, with new tools and conventions, to support their new practice.

The key research question asked:

How do university teachers construct and transform their cultural-historically located teaching practices, and conceive the resultant outcomes, when using digital resources (including video) as tools to mediate learning in the contextual settings of higher education?

Activity theory was instrumental for examining the teaching activity during a period of object transformation towards digital teaching (including while the teachers' attention was focussed upon a transitional object of digital teaching capabilities), and as mediated through various teacher-created tools (videos and support resources). Specifically for this inquiry, cultural-historical activity theory (Sannino & Engeström, 2018) was employed, as led by Yrjö Engeström in Helsinki as workplace learning and development research, where the construct of human activity is viewed conceptually as a system and methodologically as a unit of analysis (Engeström, 1987/2015). This tradition built upon the works of Vygotsky, Leont'ev, and others, as established by Engeström (1987/2015) and detailed elsewhere (e.g., Bligh & Flood, 2015; Lémonie, Grosstephan, & Tomás, 2021; Sannino, 2011; Spinuzzi, 2020), and has been built upon since.

Using the second-generation activity theory model to illustrate a unit of analysis, Figure 1 shows an iterative version of anatomy digital teaching as an *activity* undertaken by human *subjects* of university teacher-coordinators who are focussed on an *object* which is mediated through digital *tools* and university *rules* and *community* conventions, and the associated *divisions of labour*. In higher education contexts, the *subjects* are here referred to as *actors* to avoid confusion with academic subjects (courses/units/modules) within a degree. The anatomy digital teaching activity was determined over time through layers of researcher and participant analysis (Colasante, 2024). The representation in Figure 1 illustrates the activity at a time when the teachers' attention was on developing their digital teaching capabilities, that is, the problem space (Taylor, 2009) that the teachers were working on and what was being developed in their activity in relation to the ethnographic findings in this paper.

An activity is not a fixed entity; it is in a continual state of flux with potential for disturbance and change (Engeström, 1987/2015). As such, the digital teaching activity is

dynamic with potential for conflict or contradictions to occur within or between constitutive elements, as represented in Figure 1 by the convention of double-headed arrows. For example, introducing a new technology into workplace practices can cause a contradiction between the tools and the pre-existing rules or division of labour (Engeström, 2001; Ludvigsen et al., 2011).

In reality, an activity does not exist in isolation from other activity systems (Lémonie, Grosstephan, & Tomás, 2021). For example, Figure 2 uses the third-generation activity theory model to illustrate (simply) the traditional anatomy teaching activity prior to digital teaching and at the point of being networked to the new ENU digitalisation project activity. This model facilitates the identification of contradictions between boundary activities (Engeström, 2001), where multiple “activity systems [are] connected by a partially shared object” (Engeström & Sannino, 2021, p. 5). While each activity has its own object, a partially shared object between networked activities might be determined through concerted analysis.

1.2 Actions as analytical concepts

During prolonged and systemic analysis of an activity, the concept of actions can be examined from (at least) two interrelated perspectives. One perspective is viewing actions within an activity-actions-operations hierarchy, specifically the “distinction between activity and action [which] is foundational for activity theory” (Engeström, 1987/2015, p. xxviii). Conceptually, an action is comparatively simpler than an activity but more complex than an operation (Leont'ev, 1972; Spinuzzi, 2002). An *activity* (as per Figure 1) is a collective/community system with a durable object, with some form of production and a division of labour (Engeström, 1987/2015). Comparatively, an individual relatively automated/mundane *operation* constitutes a small part of carrying out an action or activity operation (Leont'ev, 1972; Spinuzzi, 2002). In between these, an *action* is consciously enacted and contributes to one or more activities, and compared to an activity has a shorter-term motive (Engeström, 1987/2015; Leont'ev, 1972). As a technical or embryonic division (Leontiev, 1976 in Lémonie, Grosstephan, & Tomás, 2021), an action is typically represented by the upper triangle of an activity system (widely attributed as first-generation activity theory, e.g., Engeström (2001)), as it does not require all the systemic elements of an activity beyond the object, subject/actor, and tool. An action can transition into a new activity when adopted by the collective and cultural conventions and community norms are established (Sannino, 2011), and a division of labour emerges (Engeström, 1987/2015).

Figure 1. An iteration of the anatomy digital teaching activity, when the teachers' focus of attention was on their digital teaching capabilities (underpinned by the second-generation activity theory model (Engeström, 2001)).

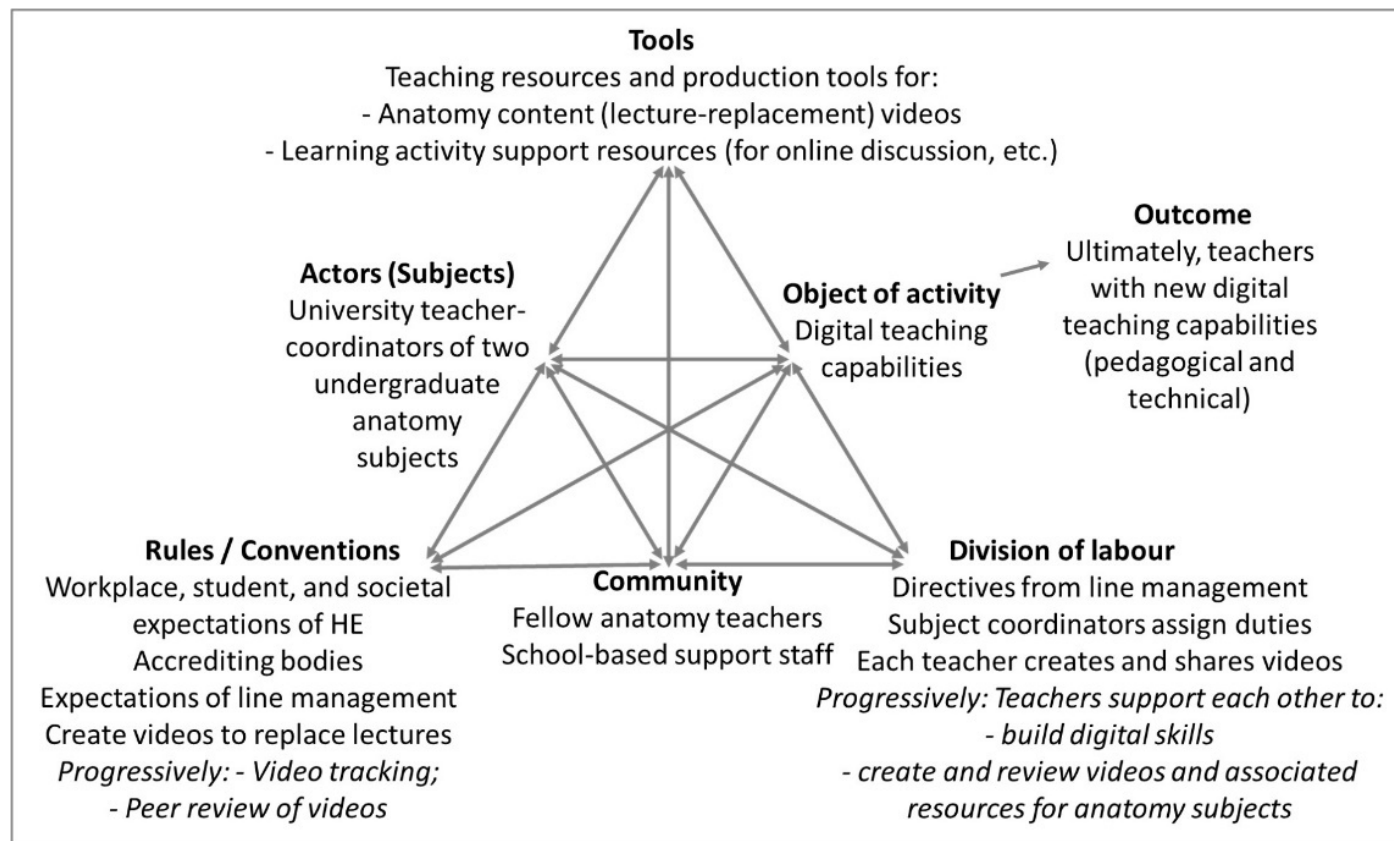
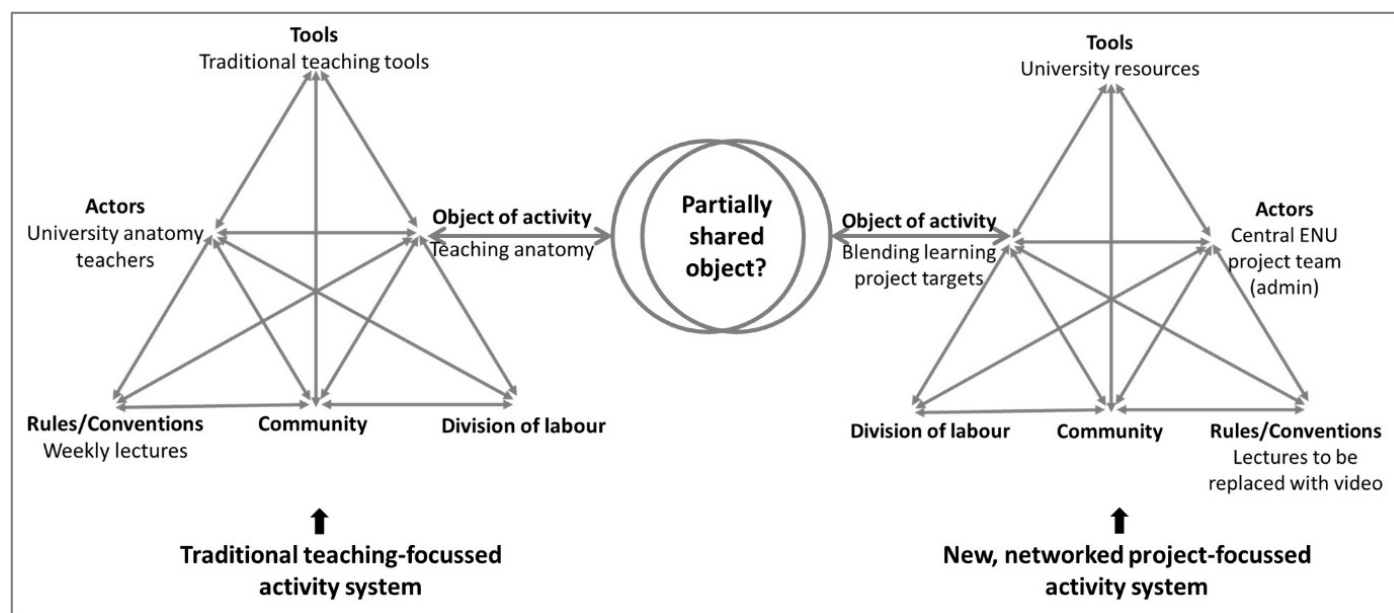


Figure 2. A simple representation of the traditional anatomy teaching activity when initially networked to the ENU project activity (underpinned by third-generation activity theory (Engeström, 2001)).



Another activity-theoretical perspective emphasises actions as agentic acts, which are pivotal for gaining control of an activity when conflict arises. Actors can take progressive agentic actions to emerge from conflict situations. Using Vygotsky's principle of *double stimulation*, people "intentionally break out of a conflicting situation [first stimulus] and change their circumstances" (Vygotsky 1978, in Sannino, 2011, p. 584), by using a second stimulus to reframe the conflict situation to enable focused action. The agentic actions taken by actors enable them to move away from a paralysing and polymotivated confrontation, once they attribute meaning to an artefact/tool and recognise its use for achieving a new motive (Vygotsky 1997, in Engeström, Nuttall, & Hopwood, 2022). Through taking actions, people can collectively learn to "deal with concrete problems within their activities" within their tangible lived experiences (Sannino, 2015, p. 1).

Double stimulation is core to transformative agency, as reconceptualised by Sannino (2022) as *double stimulation transformative agency (TADS)*, and as exemplified by the nautical metaphor of *forward anchoring* to "accomplish change amidst uncertainty" (Sannino, 2022, p. 9). This metaphor relies upon recognising a *keel anchor* as a *forward anchor* once it is coupled with a motive to re-float a grounded vessel. The first stimulus is the conflict (grounded vessel) while the second stimulus comprises the artefact (anchor) and the auxiliary motive (in this case a transient motive to unground the boat). People can "intentionally break out of conflicts of motives and change their circumstances by forming auxiliary motives (also called second stimuli) and implementing them systematically" (Sannino, 2022, p. 10). That is, forward anchoring requires a set of actions with the deliberate taking up of an artefact and an auxiliary motive "to face the conflict of motives triggered by the problem situation" (Sannino, 2022, p. 12). This includes positioning the anchor in the intended re-direction and pulling upon it to break free from the grounding; resulting in a pathway towards resolving the initially paralysing conflict (Hopwood et al., 2022).

The above hierarchical and agentic perspectives on actions are noted elsewhere, for example, as synthesised from the literature in the work of Clifford (2022). Here Clifford recognises culturally mediated actions as driven by an individual or a sub-group as finite actions to meet more personal goals, as compared to a more socialised activity towards achieving a collective object. Mediated actions are also acknowledged by Clifford (2022) for their role in gaining insights into actors' meaning making through their agentic attempts to transform their activity to meet their collective needs.

The two conceptual perspectives of actions discussed above were used in data analysis in the current study, and therefore associated terminology is used within this paper. The more recent and therefore less familiar anchoring forward terminology, inclusive of the concepts of TADS, is summarised in Figure 3 based upon the work of Sannino (2022) and the subsequent work of Hopwood et al. (2022).

2. Methodology

Activity theory as methodology significantly informed a two-phased research design to explore the digital teaching activity of university teachers, particularly the structure and dynamics of their workplace practice and their interactions as they learn to develop and change their activity over time. Activity theory guided the mapping of the field for the first phase (ethnographic fieldwork) and informed the interventionist approach for the second phase (formative interventionist workshops). For the scope of this paper, the first phase is the primary analytical focus.

For granular methodological detail on the project with an emphasis on limitations, see Colasante (2024). For example, one limitation related to timing. Ideally, the inquiry might have begun when the university-led project initially disrupted the anatomy teachers' practice, rather than partway through when the new activity was still in a state of flux albeit beginning to stabilise. To mitigate this limitation, the research employed multiple ethnographic fieldwork techniques and methods to allow present and retrospective views of the workplace change journey to emerge. Such a mixed data set can enable richness in the detail to surface (Engeström, Nummijoki, & Sannino, 2012). Additionally, input from multiple voices corroborated, extended, and challenged the constructed detail of the activity under focus, its genesis, and its transformation. Both multivoicedness and historicity are key principles of activity theory (Engeström, 2001).

2.1 Research design and participants

The first phase, ethnographic fieldwork, was a qualitative exploration of "a situated activity that locates the observer in the world" of a [university] workplace setting (Engeström & Sannino, 2012). At the time of the fieldwork, the anatomy teaching team had substantively changed their practice to incorporate digital tools in response the ENU workplace change project yet were still evolving their new digital teaching activity. The sites of the field were fluid and nonlinear (Markham, 2018), comprising a complex university workplace setting spanning campuses, schools, and online and physical spaces.

Figure 3. TADS schematic and terminology (including metaphorical nautical detail in italics), (inspired by and adapted from Sannino (2022) and Hopwood et al. (2022)).

Stasis	First stimulus	Conflict of motives	A polymotivated, paralysing situation, an uncomfortable stasis, a lack of momentum (yet) to change the situation. <i>(Disruption of the grounded boat. Hypothetical conflicting motives: A need for the journey to continue -v.- A need to not further damage the boat -v.- Emerging needs of people on board)</i>
Anchoring Forward	Second stimulus	Forward anchor	An artefact or discursive entity ascribed with new meaning by the actors. An item seen anew for its potential to aid a way forward to meet a new auxiliary motive and break free from the conflict situation. <i>(Kedge Anchor: not necessarily noticed or realised for action potential until boat is grounded)</i>
		Auxiliary motive	The actors establish an additional, associated, or transient motive; a new focus of attention subordinate to the object of the activity. The motive is associated with the forward anchor, and together a potential new pathway forward is visualised, stimulating volitional action. <i>(Motive to re-float boat, subordinate to the object of the overall journey)</i>
	Cluster of volitional actions	Search action	Ideation or attempting an action as a way of searching for ways to stabilise intended activity. Has potential to begin a forward moving process. <i>(Seeking suitable ground to drop the Kedge Anchor, so that a journey might still be realised)</i>
		Taking-over action (regaining control)	Taking an action to facilitate regaining control of the activity. The activity is now more stable, and the action has potential to progress or even transform the activity. <i>(Kedge Anchor is positioned and pulled upon; a journey might yet be achieved)</i>
		Breaking-away action	A progressive or transformative action that supports moving away from the conflict situation, resulting in achieving a modified or transformed activity. The activity stabilises in its new form until another conflict arises. <i>(Boat is re-floated; now moving away from trouble [stasis] and on a modified journey)</i>

Tools to frame the field included second- and third-generation activity theory (see Figs. 1 and 2, s1.1), along with the sensibilities of multi-sited and at-home ethnography. Second-generation activity theory framed the unit of analysis as an activity system, that of the anatomy teachers' new activity of digital teaching. The activity was followed across various and multiple physical campuses and online sites of practice, using multi-sited ethnography as "a sophisticated practice" to follow traces [related to the cultural-historical detail of the activity] including the tools used as culturally bound in the context and human behaviour (Marcus, 1995). Third-generation activity theory framed an extended focus onto interacting activity systems, principally the networked activity of ENU's digitalisation project. (Note: data collected from the networked anatomy students' activity is beyond the scope of this paper.) This structured approach to identify the boundary activities helped to mitigate a potentially blurred perspective from being too close when conducting at-home ethnographic fieldwork (Alvesson, 2009), given the university setting was the author's then-workplace.

The participants are referred to by pseudonyms and their preferred personal pronouns. The actors comprise the anatomy teachers with subject coordination roles, that is, the teacher-coordinators of U2HA (Hector and Harold) and U2AL (Adrienne and Astrid). By following the people, tools, and other traces (Marcus, 1995), as directly related to the activity, other staff were identified to interview including teacher colleagues who contribute videos to U2HA and U2AL (Cid, Christopher, and Coral), and a central university teaching and learning administrator who was involved with the digitalisation project and remained working at ENU at the time of the inquiry (Tim).

Observation formed a key ethnographic technique, supported by interviews, artefact analysis, and other fieldwork activities. Direct and online observation of the teachers' digital teaching activity occurred over an extended semester period (pre-student participation through to post-semester archived subject). On-campus observation was iterative, within planned observation-interview sessions (interactive interviews) and opportunistic as invited by individual

teacher participants. The teacher-coordinators ($n=4$) participated in multiple individual interactive interviews ($n=17$, 20-90 minutes, up to 5 per individual), which consistently included an overt on-campus observation component. The contributing teachers ($n=3$) participated in a single individual interactive interview each, also including on-campus observation. The central administrator ($n=1$) participated in a single individual interactive interview without an observation component. Intensive online observation time logged in the online classroom totalled 91.5-hours (56hrs for U2HA and 35.5hrs for U2AL). Artefacts shared for analysis, beyond online materials and interaction trails, included a video tracking spreadsheet, a peer review template, hard-copy student resources (e.g., anatomy workbook), University strategic plans, and more.

The second phase comprised formative interventionist workshops (three 90-minute workshops) conducted across the second semester, which are largely outside the scope of this paper. The workshops were inspired by the activity theory *Change Laboratory*, typically conducted in “a physical space or room in the workplace where the practitioners meet regularly to go through a cycle of analysis” (Engeström, 1999, p. 70). The workshops centred upon the teacher-coordinators’ collective analysis of their digital teaching activity, stimulated by field data and tools of activity theory.

2.2 Data analysis

Iterative data analysis occurred throughout the inquiry, utilising various activity-theoretical concepts and processes to focus the analysis. Techniques of thinking-writing analysis were employed for dialectical analysis (Engeström, 1999, 2016), and “inbetween writing” for “ethnographic sense-making and knowledge production” (Coles & Thomson, 2016, p. 253). These techniques enabled protracted iterative analysis by moving between the data and the tools and models of activity theory. The analytical process is discussed in Colasante (2024), while highlighting challenges experienced while managing a conceptually rich analysis.

Various models and concepts of activity theory (as introduced earlier, s1) were used during the thinking-writing analysis. Second- and third-generation activity theory enabled identification of conflicts and contradictions within the digital teaching activity and between it and the networked project activity. Actions by the teachers were also analysed in detail, using TADS via the nautical keel anchor metaphor (Hopwood et al., 2022; Sannino, 2022), and structural principles and concepts of actions (Clifford, 2022; Leont’ev, 1972; Spinuzzi, 2002).

2.3 Ethics

The Faculty of Arts and Education Human Ethics Advisory Group at Deakin University approved the research project, with the approval ID *HAE-16-199-Colasante*. The ethics Chair of the host university (referred to pseudonymously as ENU) gave reciprocal endorsement. Informed, voluntary consent was received by all participants prior to data collection. This article follows conventions approved by the ethics committee, including using pseudonyms and genericised subject codes and titles.

3. Genesis of the digital teaching activity and contradictions

Historically (prior to redesigning their second-year subjects of U2HA and U2AL), the anatomy teachers had redesigned their first-year subjects to comply with the blended learning model advocated by the University project administrators. The teachers created videos to replace all their first-year lectures while maintaining their on-campus practical laboratory sessions. Through the uncovering of the genesis of the digital teaching activity (via layers of field-work and analysis), various conflicts and contradictions were exposed between the anatomy teachers’ teaching-focussed activity and the project-focussed activity.

3.1 Conflict between the objects of networked activities

Recalling their initiation into the ENU digitalisation project, the anatomy teachers each described a blunt directive to participate. They were told by “the Dean [of Faculty] ... ‘You will go blended!’” (Astrid) and “told that we would no longer have lectures” (Cid), confirmed with unequivocal phrasing from other teachers such as, “forced”, “you will do”, and “decree from above”. The directive-styled messaging was confounded by a lack of clarity, as exemplified retrospectively by one teacher: “I don’t think that policy was well articulated to the staff who then had to enact the change, as to why we were doing it ... [it] felt like some arbitrary thing that we had to do” (Harold).

The lack of clearly articulated motives for the project left the teachers guessing the reasons for change. One guess included “a cost containment exercise” for a “quick and cheap” solution to the difficult situation of teaching anatomy across multiple campuses (Cid). Additionally, the timing of the project, occurring concurrently with a university re-structure, led staff “to read motives that may not have been there, such as making [lecture-replacement] videos as a way

to make more academic staff redundant” (Harold). Other guesswork included flexibility around freeing teachers from teaching duties, or “decreasing workloads” (Hector) so that more “time can be devoted to research ... [however] in the short term it takes [time to create videos]” (Christopher). There was also recognition of sector-wide moves to increase technology-enhanced learning, “a collective push amongst many universities ... [for] some of the new teaching techniques that are coming out” (Christopher).

Beyond the Dean’s directive for change, the anatomy teachers had no clarity of the chain of command. Ethnographic traces led to a senior administrator in a central teaching and learning department who was involved in the project’s inception, Tim, who clarified that the directive to the deans of faculties came from a central ENU area. The teachers may have “learnt later-on down the track via their faculty [management], at the point that they were being asked to engage in a redesign”, which “may have seemed [unexpected]” (Tim). According to Tim, the project was seeded when a former ENU executive aspired “to make break-through change within the University”, by looking “at what [innovative] practices were being adopted [elsewhere]”. This culminated in a “drive towards a blended learning target”, targetting 60% of enrolled students to experience blended learning (Tim). To achieve “the greatest impact”, the first tranche of subjects was selected in terms of large class size (Tim). The anatomy teachers’ Dean, as Faculty leader and seeming to reproduce the rules aligned to the project target, initially nominated large first-year anatomy subjects for redesign.

During the project execution, a conflict surfaced between the respective objects of the project-focussed and the teaching-focussed activities. The digitalisation project, while implying a qualitative desire to foster innovation and upskill the workforce, nevertheless conveyed an object of a quantitative target. This numerical orientation, voiced by Tim and supported by university documentation (e.g., strategic plans), may have overshadowed a motive more aligned to teaching needs. Tim conceded that while the project was “configured” as a “measure” of student numbers, it was not “to put things online for the sake of [it]” but “to improve student retention and student success” (Tim). An obscured partially shared object (see Figure 2, s1.1) between the teachers and the project staff might have been maximised during the project execution, coalescing around a positive impact on workplace capacity building to support blended learning teacher practices for improved student learning experiences.

Project staff may have inadvertently undersold technology-enhanced teaching by not clearly communicating potential advantages. The anatomy teachers, in retrospect, queried the lack of communicating the benefits of blended learning, when “there actually is really good evidence to show that it is just as effective, if not more effective, than face-to-face learning” (Harold). Indeed, there is “growing consensus” that a coherent and well-integrated blend of face-to-face and online learning “is an effective approach to teaching and learning in higher education” (Bowles & Kaviani, 2023, p. 3). Later, in the formative interventionist workshops, the anatomy teachers collectively lamented that there was no time at project initiation to analyse “what worked” (Harold) and that the project staff did not convey “how it helps” (Adrienne). Such problems seeded from not consulting teachers during institutional digitalisation and determination processes are long understood (Cuban, 2001; Gorrell, 2023).

3.2 Contradictions related to resources

Resource-related contradictions surfaced between the project-focussed and the teaching-focussed activities. Despite being initially “forced to go blended that way”, that is, replacing all on-campus lectures with video (Astrid), negligible technical support and infrastructure were available from the project team for the teachers to achieve the adopted rules of the advocated, standardised blended learning model.

Training in video editing was offered, which most of the anatomy teachers attended, “but that was it ... no more support” (Astrid). If a teacher “couldn’t make it to the [training session]”, they resorted to “pointing and clicking and hoping ... [they were] doing the right thing” (Harold). Compounding this issue, because the project commenced during a restructure involving staff redundancies, clashing projects meant that “a lot of the people who [usually] provided technical support ... were retrenched ... [just when ENU] was pushing us to blended learning” (Adrienne). Having high expectations of quality learning products, Coral was “frustrate[d]” that the teachers were “doing this basically on our own with very minimal support”.

Availability of infrastructure, for both video production and storage, was another issue. Compact video-recording booths were available, however, these were designed for talking-head-style slide presentations and proved not suitable for anatomical demonstrations (Astrid). Additionally, while the University was in the process of developing a video repository platform, there was otherwise no dedicated

place to house teacher-created videos. Given the “[online classroom] couldn’t handle video streaming”, Cid asked: “Well, ‘Where do you want me to put it?’”

Views on resource provision were different depending on perspective. As a project representative, Tim’s view of “committing quite a lot of [resources]” was challenged when represented in later workshop analysis, where the teachers unanimously disagreed. For example, Adrienne described being directed by project staff to “use my [budget] phone to make videos” despite its rudimentary functionality. While resourcing issues can present as typical annoyances in various university settings, there was a clear contradiction between being able to enact the new rules adopted from the project activity without also overtly receiving the tools to do so.

4. First round agentic actions

The anatomy teachers’ compliance with ENU’s digital initiative placed them in a conflicting situation. It disrupted the social structures of their teaching practice. They experienced changes in tools and rules compared to their previous existing culture of predominantly on-campus teaching involving the historically fundamental practice of lecturing. The teachers compliantly (albeit reluctantly) adopted the project-directed model in their large-cohort first-year anatomy subjects; however, they were unsettled by the outcome. Such dissatisfaction is not unusual, for example, teachers in a New Zealand tertiary institution found that their purposefully designed pedagogy was curtailed once they adopted a workplace-stipulated standardised model for using web-based technology (Lawrence & Lentle-Keenan, 2013).

The anatomy teachers found themselves in a bind. At this point, where the teachers had met their digitalisation obligations with their first-year subjects, they could have exercised their agency to resist any further involvement or practice changes given that they had fulfilled “the directions set by central administrators” (Hökkä, Eteläpelto, & Ras-ku-Puttonen, 2012, p. 92). The teachers could have ended their contribution to the project’s numerical target by not participating further, versus extending the standardised model that they weren’t satisfied with into other anatomy subjects. To complicate this otherwise binary position, the teachers came to believe that some aspects of blended learning were beneficial for teaching the visually rich subject of anatomy. This conflict of motives required the teachers to work through their choices on hand to determine a direction to proceed to wilfully control their own behaviour (Sannino & Laitinen, 2015).

In reaction to the conflict that they experienced (first stimulus), the teachers gave new meaning to the videos that they had created and also to the limited resources accessible to them. By attributing new motives to these artefacts, to (a) design their own blended learning pedagogical models and to (b) build their own digital-technical skills, they found stimulus to act. This second stimulus, involving these two auxiliary motives, provided two pathways of action to ultimately break out of their conflicting situation and move forward to a more stabilised activity (Sannino & Laitinen, 2015), initiating a way forward to volunteer to blend their two second-year anatomy subjects of U2HA and U2AL.

4.1 Developing pedagogical models

Despite their trying experiences with changing their first-year subjects, the teachers came to “believe” that blended learning was worth adopting due to recognising how video “works better” for anatomy as a visual subject (Astrid). If the videos are “used well, if created in a strategic way, [they] can ... improve from the face-to-face lecture”, while “blended learning ... [also] retains face-to-face elements” (Coral). By using teacher-created videos as lecture-replacement tools, visual affordances of teaching anatomy were maximised:

we can do a much better job of presenting information when we are able to have [anatomical] models, have skeletons, show the range of material ... so that ... [students] can make more sense of ... [diagrams in books which] are not always easy to interpret. (Astrid)

The seeds of transformation were sown when the teachers recognised how their video artefacts could support a new motive to design their own bespoke blended learning models. The anatomy team volunteered their second-year subjects while resisting the rules of the standardised model of replacing all lectures with digital learning (compared to acquiescence for their first-year subjects). They determined “Let’s voluntarily go there and do it our way”, on our terms rather than following a model that somebody else dictates [because] ... having some control over the model is really important” (Adrienne). The teachers used their agency in search-styled actions to determine their own models. They took control when deciding to retain some of their live lecture interactions with students. Ultimately, the U2HA teachers retained four live lectures across the semester while the teachers for U2AL retained half of their lectures, each replacing the discontinued ones with videos and associated resources.

The act of retaining some lectures suggests continuity of historical university pedagogical practices, despite the ENU efforts to increase digitalisation in teaching. The renewed pedagogical approach, however, enabled the teachers to go beyond substituting lectures for videos. In breaking-away actions they transformed their remaining lectures. For U2AL:

[by creating] videos to replace half of the lecture time ... we've tried to ... [change our practice from] "Here's a whole bunch of information" that we would stand in the front of a lecture room and transmit, to "Let's do most of that on a video, and then let's use the face-to-face time [differently]". (Adrienne)

As a result of this breaking-away action, the lectures became "completely interactive and addressing issues, almost like a tutorial-style rather than a lecture" (Adrienne). For U2HA, the four retained lectures were reconfigured away from content delivery to feature interactions for consolidating student learning, where students submit questions or nominate topics in advance for the teacher to "guide them through" (Hector). The U2HA and U2AL teachers developed active learning pedagogical strategies to evolve their digital teaching practice, including intentionally designing learning activities into most of their videos. (Note: how this active learning approach was engaged with by anatomy students is the topic of a paper in development.)

4.2 Developing digital skills

To support their new pedagogical models, the anatomy teachers identified the need to develop digital-technical skills. The contradiction between insufficient project resourcing and the teachers' resource needs created a cascading contradiction within the teachers' activity system, between their tools and their division of labour. To sustain their new digital teaching activity, the teachers were unable to rely on resources from their otherwise networked project-staffed system, and instead persevered by individually and collectively seeking their own resources. Such a secondary contradiction is not unusual, given:

When an activity system adopts a new element from the outside (for example, a new technology or a new object), it often leads to an aggravated secondary contradiction where some old element (for example, the rules or the division of labo[u]r) collides with the new one. (Engeström, 2001, p. 137)

Local (but limited) video production resources came to have new meaning in association with the new motive to develop their digital skills. The teachers sought and shared

disparate locally available resources to help master video production, and to support their bespoke models, and chose their preferred video capture and editing software to suit their needs (Astrid). They made use of basic webcam recording equipment in their offices, and videorecorded anatomical demonstrations in laboratory spaces using production equipment such as "a video camera there [on loan] ... the tripod ... [and] the [homemade] green sheet that we tack up on the wall ... [to] reduce distractions" (Adrienne).

Taking control, the teachers established their own "support group within the discipline" to learn "how to ... [edit the videos] ourselves" (Astrid). The technology, according to Harold, "was completely new to all of us, and we were kind of winging it ... [but] I got more confident with the process and the software". Some of the teachers were pleased with how they managed, while others lamented that better products could be created with better resourcing. However, as Christopher summarised, "We sort [things] out by ourselves". From the project as "the starting point, we've improved from there; dragged ourselves up and learnt some skills" (Adrienne).

In break-away actions, the anatomy teachers moved beyond individually focussed actions to collectively foster skill development across their discipline community. They created a guidance resource to help each other to produce videos: "A how-to video ... [to offer] a good way to start" (Christopher). Despite the teachers' precarious start to the blended learning project, by "initially being forced to do it ... [this] enabled us to maybe really think about it and consider it for our other subjects" (Coral). Due to "the experience of blending ... first-year subject[s], we developed some of our own policies and own ideas on how to tackle it for the rest of our subjects" (Astrid). Through a series of volitional actions, the anatomy teachers were able to change their context from conflicting to enabling, where "we've got the facilities; we've got the tools ... the extent to which we develop a clip is really dependent on ... how much we want to interact the students with the knowledge" (Christopher). Their new digital teaching models and skills enabled them to choose to forge their own way forward to remodel further anatomy subjects.

4.3 Teachers as collegiate learners

Overall, the agentic actions that the teachers underwent to transform their digital teaching activity (and to ultimately stabilise it as discussed next) called upon the collegiate nature of their anatomy discipline community in the forward anchoring process. Established historically, the anatomy teachers work via a discipline-centric approach,

which crosses the boundaries of ENU workplace structural arrangements, for example, they use “discipline meetings” to raise teaching issues (Adrienne) and collaborate on scholarly projects (Hector). This social interaction constitutes a “curious situation, because we sit in ... different schools within the university, but we work quite well as a discipline” (Cid). This collegiality may have influenced the transformative change that occurred in their regular workplace setting. The anatomy teachers portrayed features exemplifying relational and transformative educators, who are interested in learning in their workplace contexts, within learning ecologies where “colleagues are crucial” (Ranieri, Giampaolo, & Bruni, 2019, p. 1683). The role of collegiality has been noted as helpful in fostering growth in practice in other higher education teaching studies (e.g., Fitzmaurice, 2010).

Reflecting on their overall activity transformation in subsequent workshops, the teachers acknowledged their collective digital teaching skill development. They commended their own expansive response to change, acknowledging: “we’re all such resourceful folks” (Harold), and “we made our own resources ... [and] our own how-to guides, and shared them with each other because they weren’t [otherwise] available” (Adrienne).

5. Second round agentic actions

After the anatomy teachers had established their pedagogical models and developed associated technical skills, they faced a further conflict situation. The teachers wanted to continue their digital teaching activity, which they had spent considerable time developing; however, they found that they were not yet satisfied with this activity. They wanted a more manageable video production process and better-quality videos compared to those they had initially produced. Thus, the teachers experienced a further conflict of motives while their digital teaching capabilities continued to be their object of attention. In this next series of actions, the teachers gave significant meaning to a networked shared drive which all the ENU anatomy teachers had access to. This drive held potential as a second stimulus once aligned with motives to (a) establish production efficiencies and to (b) produce better quality products.

5.1 Utilising historical workload sharing

Leveraging an historical disciplinary tradition of sharing the lecture load across subjects, the teachers now contribute video content for each other’s anatomy subjects. With the change in practice, “generally whoever used to do the face-to-face lecture, if they’re still around, you assign them to

do a video clip instead, or a series of video clips” (Hector). However, cultural conventions around the division of labour altered with the shift from lecture-centric to primarily digital teaching of topic content. Historically, *who* lectured on *which* topic was influenced by *how* “the timetable worked for them” (Hector). One anatomy teacher who “made two videos on the foot, because that was his specialty”, had previously given “those lectures when his timetable permitted” (Hector). The constructs and logistics of a university timetable (as rules that influenced the division of labour) could be overcome when video replaced lectures and could prioritise academic expertise.

The anatomy community’s sharing of the video production workload was practical due to workload efficiencies. For example, given “it takes a lot of time to develop [a video] ... why limit it to one subject, when it could be used across three or four” (Cid). The resultant approach was to design the videos “in a way so that ... they could be used across” several anatomy subjects (Coral) spanning multiple allied health degrees. Sharing teacher-created videos has been noted as efficient practice in other universities (e.g., Huberts, 2017).

Ultimately, the teachers created a suite of content videos, 84 for U2HA and 50 for U2AL. Progressively, the teachers established cultural conventions for further video production efficiencies and to improve video quality, as discussed below.

5.2 New conventions for work efficiencies

While multiple teachers were contributing videos, there was frustration around “no university-provided place to put your videos” (Adrienne). The teachers were “putting [them] all over the place” (Cid), and thus arriving at multiple, disparate solutions. In search actions, the teachers found that “[s]ome people use a library server, some people use *YouTube*, some people use the *Echo* software to store the videos” (Adrienne). Nevertheless, the anatomy teachers decided not to mandate one repository to host their videos.

The teachers took control by creating a tracking database within their shared drive to identify and locate all their teacher-created videos. This forms “a database where colleagues will indicate what clips they’re going to be developing ... [and] when it’s completed ... then it becomes a resource for all [anatomy] coordinators to use” (Christopher). It presents as a spreadsheet purposed as a tabled database organised by human anatomical region, for example, “vertebral column ... lower limb ... foot and so on”, within which each video “has a title ... the subject it’s being used in, who created it, and the link to get to it” (Cid),

and is mapped to associated subjects. In a breaking-away action, the tracking system formed a new convention in the digital teaching activity. The process was matured, formalised, and mandated for all anatomy teaching staff to use:

We've got a database that's available on the server that all our staff can access where we put the link to our videos, and we also have a folder with all the work sheets that accompany each video, so ... there's a central [system]. (Coral)

5.3 New conventions to improve video quality

In parallel, the anatomy teachers noticed some errors and other issues of quality in their content videos. They were challenged with evidence of low production quality, and “the need for making sure of the [content] accuracy ... which then led to this process of ... [questioning] ‘How do we deal with this?’” (Cid). Informally, the teachers accepted that videoing complex anatomical concepts while manipulating various anatomical models was “easier if there’s a colleague ... to help” for logistical support (Christopher). They “[help] film each other” and “together ... work out who’s going to help film what” (Hector).

On a formal level, Adrienne drafted a peer review template to share in the drive in a search-styled action for a quality solution. The peer review option was valued by the team, given a “quality process is critical” for pre-recorded content where “students expect it to be right” (Cid). In a taking-over action, “as a team we set this up” to aim for professionally presented content to be “shared across our discipline” (Cid), with peer review subsequently adopted and progressively improved by the team. When such a “first expression of transformative agency is initiated by an individual, it requires collaboration and collective agency in order to survive and expand” (Haapasaari, Engeström, & Kerosuo, 2016, p. 258). The evolved peer review template or “feedback form” comprises technical detail such as “does it work, is the audio right, is the magnification right, are the visuals right ... and then the content, obviously” (Astrid). Once the reviewer fills out the form, required changes to the video “are made, and then it comes back for a final look, before it goes onto the [online classroom]” (Hector).

In break-away actions, the teachers formalised and mandated the new peer review convention. They no longer “make the videos in a vacuum; they’re all peer-reviewed and then amendments made before ... being published for the students’ use” (Harold). With peer review “for every one of our videos now” (Astrid), the process is supported by a division of labour reliant on goodwill and availability, with

no “hard and fast rules about who should review it, but that the process should be used ... [including the] template to do the reviewing” and all managed via the shared drive (Cid). Coral provided an intrinsic motivation for reviewing others’ videos, in that “you learn a lot from one another” while simultaneously supporting colleagues to create the “best products that they can”.

5.4 Anatomy teachers’ contributions to the University project

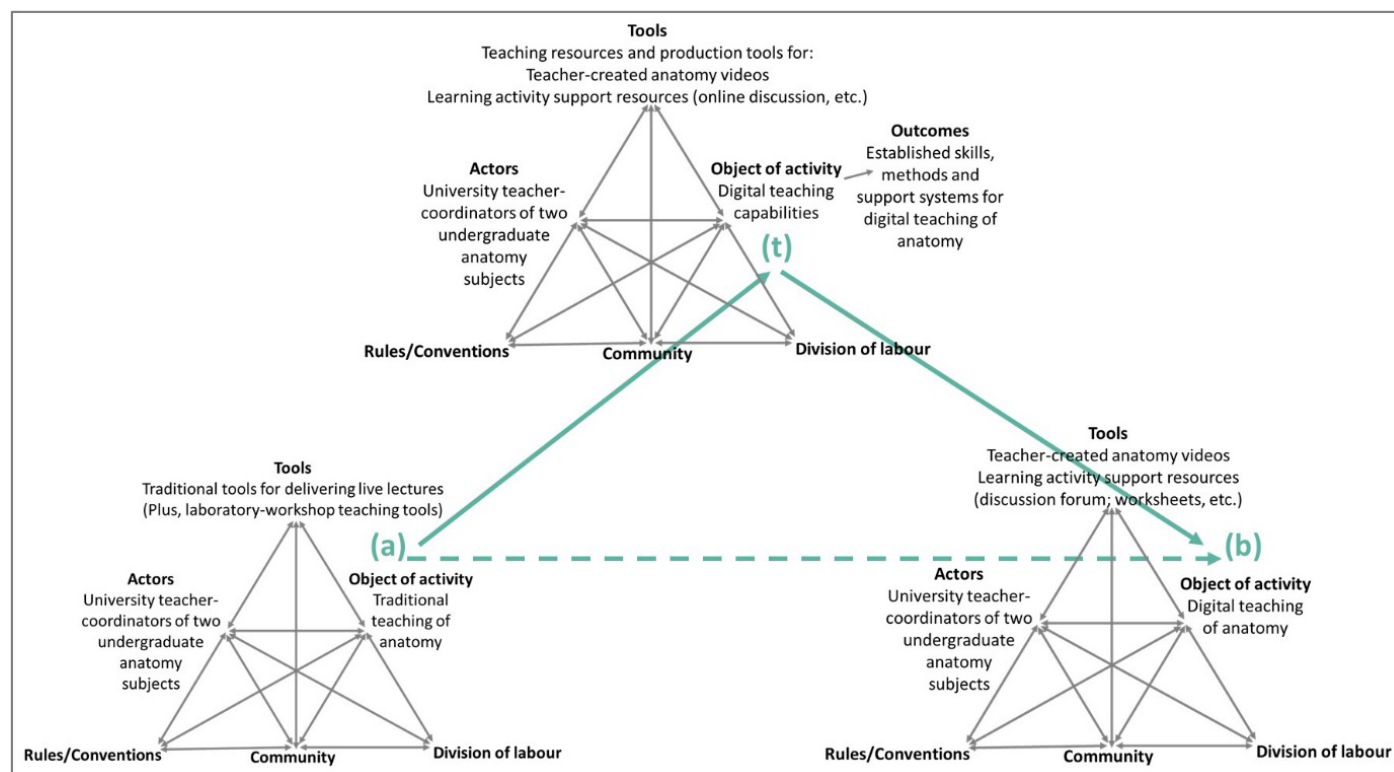
Overall, the agentic approach the anatomy teachers ultimately took contributed to the ENU target for blended learning. With “90% of our subjects ... blended”, given “the University ... [was] aiming for ... 60% blended; we’re well and truly above that in our area” (Astrid). While the project’s target of 60% involved counting enrolled students rather than subjects (Tim), regardless, the work of the anatomy teachers clearly positively contributed. Of the remaining on-campus anatomy subjects, some were planned for “going blended very soon”, while one or two “third-year dissection subjects” will remain in on-campus mode for the necessary “hands-on” experience (Astrid).

6. Discussion

The conflicts and contradictions that surfaced during the digitalisation project, stemming from discordant objects and insufficient resourcing, meant that the anatomy teachers needed to make their own “innovative attempts to change the activity” (Engeström, 2001, p. 137). Within their discipline community, the anatomy teachers engaged their agency to take various volitional actions to transform their teaching practice. They chose to work outside the project boundaries and ultimately constructed a robust digital teaching activity by giving substantive attention to their digital teaching capabilities.

6.1 Tracking the object of the activity system(s)

The agentic actions that the teachers took to gain control of their activity contributed to transforming their object, including towards a transitional one of building digital capabilities to support a new but ongoing object of digital teaching of anatomy. Figure 4 offers a simplified visualisation of tracking the object, representing what otherwise took layers of historical and dialectical analysis to authentically determine (Colasante, 2024). To transform the initial activity with the object of (a) traditional teaching of anatomy to (b) digital teaching of anatomy, the (t) transitional object of digital teaching capabilities acted somewhat

Figure 4. Tracking the object of the anatomy teachers' activity transformation.

as a hurdle object, one that held the teachers' attention for a sustained period until their transitional object was substantively achieved (see *Outcome* in Figure 4). Note that the figure focusses on the changing object and does not represent the full social-cultural contexts of the activity systems. For example, working on the transitional object required a tighter, staff-based community (see *Community* in Fig.1, s1.1) compared to the ultimate ongoing activity community involving more people (e.g., students, tutors).

The teachers' object of digital teaching capabilities was itself a new object that arose from "unintended consequences of multiple activities" (Engeström, 1987/2015, p. xvi) while confronting the project requirements and their own capability gaps for teaching in new ways. Once reaching a substantive outcome for the transitional object, the teachers were able to centre their attention more substantially onto their digital teaching of anatomy. The transformation that the anatomy teachers underwent in their teaching activity helps to illustrate that while objects are "durable concerns", "carriers of motives", and "generators and foci of attention", people through their activities "constantly change and create new objects" (Engeström, 1987/2015, p. xvi).

6.2 Consecutive series of agentic actions

While striving to reach the transitional object of digital teaching capabilities, the teachers as a collective (and independent of the project administration) underwent multiple TADS cycles. During this somewhat messy process, the teachers faced and resolved iterative conflicts of motives. For each conflict they faced, the teachers used artefacts and aligned auxiliary motives to iteratively implement various actions to alter their circumstances and break away from their conflict situations (Sannino, 2022) and to ultimately expand and stabilise their activity.

Applying the TADS framework (Hopwood et al., 2022; Sannino, 2022), Figure 5 summarises the volitional actions that the anatomy teachers progressively took in response to the conflict of motives that they experienced (first stimulus) after remodelling their first-year subjects to the University's stipulated model. The teachers, within their own discipline community, gave "significant meaning" to some artefacts (their videos and disparate local resources) and constructed "a new understanding of the initial problem" (Engeström, Sannino, & Virkkunen, 2014, p. 121). The artefacts, coupled

Figure 5. Agentic actions: from conflict to arrive at pedagogical remodelling and technological upskilling

Stasis	First stimulus	Conflict of motives	To end contribution to numerical targets after their first-year subjects – v. – To contribute further subjects despite dissatisfaction with standardised model and insufficient resourcing – v. – To extend components of what worked well with blended learning for anatomy	
Anchoring Forward	Second stimulus	Forward anchor	(a) <i>Artefact</i> : Initial teacher-created videos	(b) <i>Artefact</i> : Local, random video production resources
		Auxiliary motive	To develop their preferred pedagogical models, to make blended (digital and on-campus) learning better to suit anatomy	To develop their own digital technical skills
	Cluster of volitional actions	Search action	Individually and collectively put forward options for various blended learning models	Individually and collectively consider locally available video recording spaces, equipment, and video editing software to suit their needs
		Taking-over action (regaining control)	Design bespoke models, tailored to each anatomy subject, e.g., number of lectures to keep, active learning design elements	Collectively establish a video editing community of practice / support group
		Breaking-away action	Develop models to include active learning strategies: re-design remaining lectures to be more active; add activities to videos	Consolidate a discipline-based peer-support unit, for ongoing digital skill development and video creation for further anatomy subjects

with the auxiliary motives to design their own bespoke models of blended learning, and to develop their own digital-technical skills, provided a pair of second stimuli to prompt various actions along two action pathways (as summarised under (a) and (b) in Figure 5).

Figure 6 summarises the agentic actions that the anatomy teachers took after remodelling their U2HA and U2AL second-year subjects and after facing a new conflict of motives, again applying the TADS framework (Hopwood et al., 2022; Sannino, 2022). The new meaning the teachers ascribed to their shared drive, that it could provide a mechanism to support new work processes for work efficiencies and producing better-quality outputs, provided the stimulus to act along dual action pathways (as summarised under (a) and (b) in Figure 6).

Such consecutive iterations of conflict and stabilisation are not unusual for complex problems. For some demanding situations, single or “stand-alone cycles of double stimulation are insufficient and repeated implementations are necessary” (Sannino, 2022, p. 22). The anatomy teachers’ various searching, gaining control, and breaking-away actions resulted in pedagogical remodelling and digital reskilling, plus establishing ongoing system support mech-

anisms. These actions all contributed to achieving their object of their digital teaching capabilities, which in turn equipped them to better attend to their ongoing object of digital teaching of anatomy. The teachers became a largely self-sufficient collective to ensure that their new digital teaching activity can function sustainably with potential to be ready for further evolution if other conflicts arise. Such longitudinal development is intertwined with transformative agency (Sannino, 2022).

6.3 Agentic actions to stabilise activity v. agentic actions that become auxiliary activities

Structurally, the first round of agentic actions, that of pedagogical remodelling and technical upskilling, moved from individual actions to collective endeavours. However, these actions did not each form durable objects of an ongoing activity system, as their motives were largely met while the teachers worked towards building their digital teaching capabilities. During this sub-step of expansion, these teacher-led self-regulation actions ultimately “dissolve[d]... into the whole community of the activity” (Engeström, 1987/2015, p. 261). The dissolving of these actions into the activity resonates with novice-to-expert workplace developmental learning, that is, a trend for workers to apply

Figure 6. Agentic actions: from conflict to arrive at improved production and quality processes

Stasis	First stimulus	Conflict of motives	To continue the digital teaching activity which the teachers had spent considerable time developing – v. – Not wanting to continue unmanageable work processes nor settle for the current standard of video quality	
Anchoring Forward	Second stimulus	Forward anchor	(a) <i>Artefact</i> : shared drive	(b) <i>Artefact</i> : shared drive
		Auxiliary motive	To establish video production and process efficiencies	To produce better quality videos
	Cluster of volitional actions	Search action	Individual teachers share and consider their video storage solutions	An individual teacher drafts and shares a video peer review template. Other teachers consider the template
		Taking-over action (regaining control)	Collectively create a database for tracking production and sharing access to videos (and video-related resources)	Collectively trial and refine the peer review template, and establish a shared peer review process
		Breaking-away action	Collectively implement video sharing/tracking process. Formalise as a system support mechanism. Mandate process	Collectively implement a refined peer review process. Formalise as a system support mechanism. Mandate review for each video

more tacit knowledge and less explicit knowledge the more expert they become, while also acknowledging activity-based achievements built through interactive encounters between people and their mediating artefacts (Spinuzzi, 2020). The first-round actions contributed to stabilising the teachers' new digital teaching activity and to underpin a level of teacher expertise in digital teaching capabilities. The motives and outcomes of these actions were implicit until overtly surfaced during the fieldwork as part of the teachers' historic (albeit recently historic) development.

Comparatively, the more recent second-round actions of efficient production and quality assurance formed ongoing motives and production elements that indicate a transition of actions to activities. At the time of the fieldwork, these actions continued to be explicit areas that required overt teacher attention in their contexts of contributing to the still relatively new activity of digital teaching of anatomy in a productive capacity. This warrants examination using the conceptual differences between actions and activities.

Video production and quality assurance might each constitute discrete actions which contribute to the digital teaching activity; however, each action developed full system elements to arguably become activities. Nevertheless, these

new activity systems only emerged to support digital teaching, thus they are auxiliary to and help to sustain the focal activity. The associated ongoing (and still explicit) labour in each involves members of the community assisting each other during production and post-production stages while working toward their respective auxiliary objects. The new auxiliary activities go beyond short-lived or transient actions, given their respective durable objects continue into their ongoing work and the production components (producing anatomy teaching tools), and each required a new division of labour to emerge (Engeström, 1987/2015).

Figure 7 represents the anatomy teachers' auxiliary activity of efficient video production, as developed from individual actions into a collaborative activity system. This presents a stand-alone activity with a durable object (Engeström, 2001) of a manageable video production workload for replacing lectures with content videos.

Similarly, Figure 8 represents the auxiliary activity of quality assurance of videos, with its own inherent system and the durable object of quality anatomy teaching resources. Both auxiliary activities commenced as "innovative actions"; yet, once recognised, developed, established, and adopted by the teaching community, they transitioned and

Figure 7. Efficient video production (including creation, sharing, and tracking), which developed from individual actions to a new collective auxiliary activity

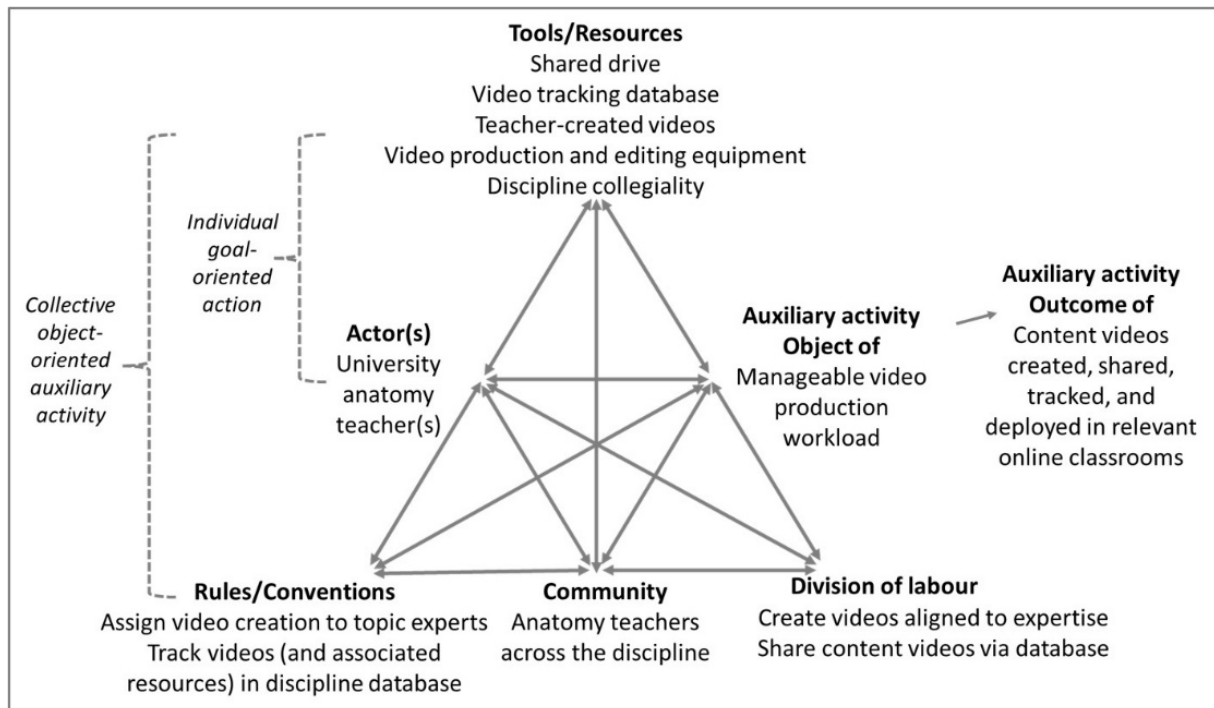


Figure 8. Quality assurance of videos (including peer review), which developed from individual actions to a new collective auxiliary activity

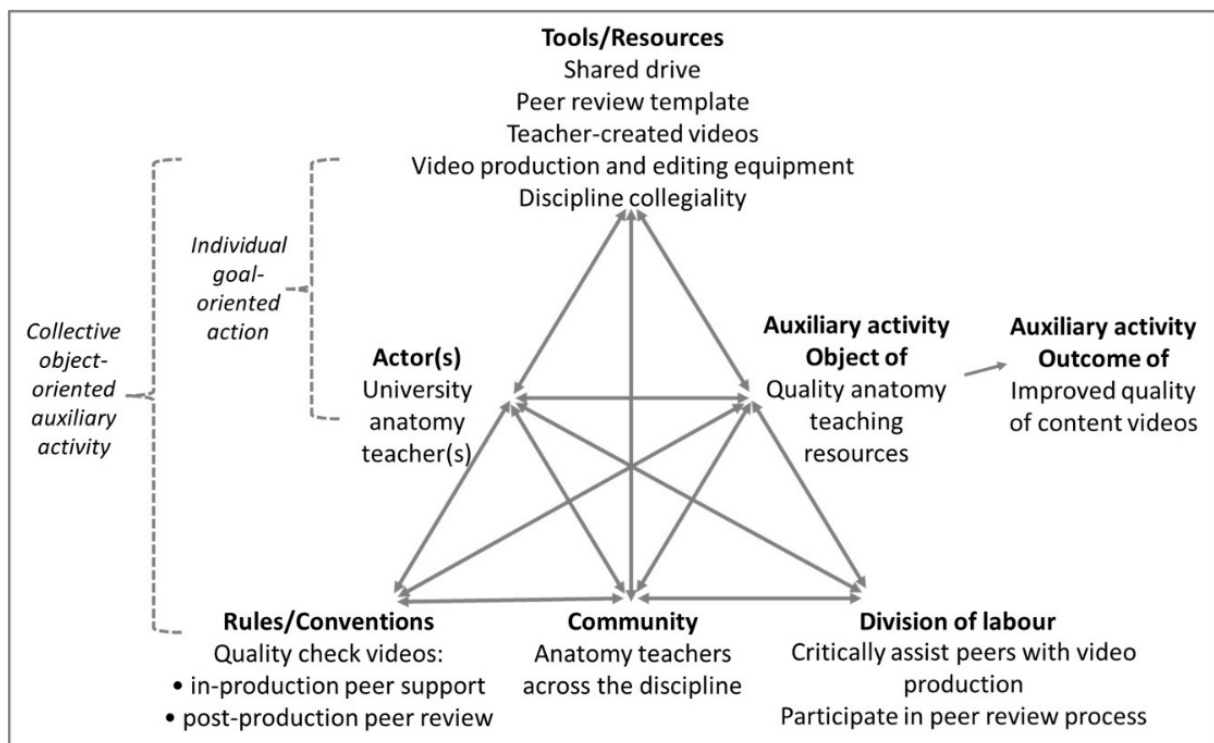
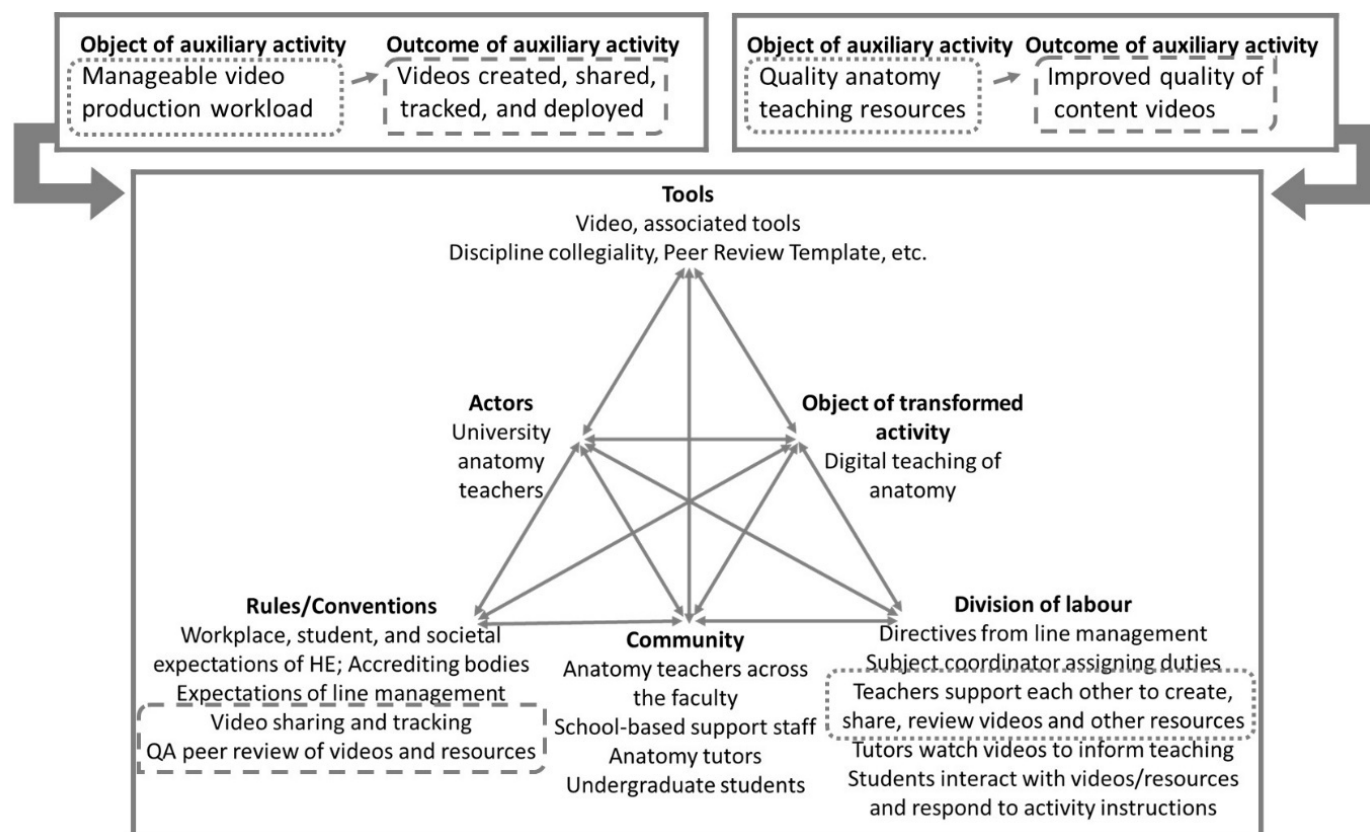


Figure 9. Collective influence of the auxiliary activities within the focal digital teaching activity



broke “through into new forms of activities” (Sannino, 2011, p. 573), each with a division of labour within the teaching community. The shared workloads of video production and quality assurance contribute to the ongoing digital teaching activity system and arguably constitute auxiliary activities to the focal one.

If the auxiliary activities are only viewed as discrete activities as illustrated above (Figs. 7 and 8), this view risks a fragmented analysis that is “understandable only when interpreted against the background of [the] entire activity system...” (Engeström, 2001, p. 136). In isolation the auxiliary activities might be void of some significant direction, meaning, and purpose. Nevertheless, they are showing signs of how they might ultimately dissolve within or at least currently influence the digital teaching activity. For example, the new conventions of video tracking and peer review became progressively incorporated into the internal structure of the teachers’ activity (see italics in prior Figure 1, s1.1) and have become routinised as ongoing sustaining mechanisms for the digital teaching activity.

When viewed in Figure 9, within the context of the digital teaching activity system, the auxiliary activities are shown to be subsumed within and contribute to the transformed digital teaching practice, by way of leading to new and ongoing cultural conventions and divisions of labour within the teachers’ new activity. Specifically, the auxiliary outcomes influence the cultural conventions, and the auxiliary objects influence the division of labour. This is illustrated by the objects and outcomes (upper windows) from the teacher-developed auxiliary activities, which in turn support the digital teaching activity (larger window) by contributing new cultural conventions (dashed frames) and divisions of labour (dotted frames). At this point, the teachers’ object of *digital teaching capabilities*, signifying their “project under construction” (Engeström, 1999, p. 65) as evidenced during the ethnographic phase of this study, is arguably achieved. The teachers’ new capabilities equipped and positioned them to direct more substantive attention onto their ongoing object of *digital teaching of anatomy* (as indicated in Figure 9).

By establishing workable solutions for their video production workload and to elevate quality, the teachers collaboratively “master[ed] their joint actions in transforming the context of their daily work” (Virkkunen, 2006, p. 49). The teachers redefined their situation through developing, formalising, and routinising two new auxiliary activities, video production and quality assurance, to move forward and to ultimately help to sustain their evolved digital teaching activity.

Just as “any specific production must at the same time be *independent of and subordinated to* the total societal production” (Engeström, 1987/2015, p. 66, original emphasis), the auxiliary activities help to stabilise and further transform the practice of anatomy digital teaching. This illustrates how associated actions can make potentially transformative contributions in generating a new form of the focal activity (Sannino, 2011). While these actions-turned-activity tentatively sit in harmony with the digital teaching activity, this can change when actions clash in relation to the overall system (Engeström, 1987/2015). If new conflicts or contradictions arise, the practitioners might begin to envision further changes (Sannino, 2011).

6.4 Researcher subjectivity/critique

Qualitative researchers tend to openly acknowledge their subjectivity and their inability to be completely separated from their research (Pelias 2018). By extension, there are areas ripe for reflexive critique in the (largely) ethnographic phase presented of this activity theory study.

First, the term of auxiliary activity in this discussion is relational to the activity under the researcher’s focus. What constitutes an activity, compared to an auxiliary activity, is arguably dependent on the researcher’s focus on the anatomy teachers’ digital teaching practice. Comparatively, in an alternative inquiry centring on wider teaching practice (focussed on a specific object), digital teaching might form an auxiliary activity. However, regardless of subjective perspectives of activity hierarchy, in a “complex and differentiated society, there exists a multitude of relatively independent activities”, and “within any such relatively independent activity system, we find the same internal structure” (Engeström, 1987/2015, pp. 64-65, emphasis removed).

Actions that ultimately establish a system need a mechanism of representation. Just as “actions make more sense when they are understood within the activities in which they emerge” (Engeström, 1987/2015, p. xxviii), the auxiliary

activities make more sense when seen for what they contribute to the focal activity. Figures 7 and 8 in this paper illustrate two auxiliary activities based upon second-generation activity theory modelling, while Figure 9 offers an example for illustrating how the auxiliary activities might be enmeshed within the activity under focus. This granular way of representing subordinate or auxiliary activities in relation to the focal activity might help towards resolving a known issue of ascribing multiple objects to a single activity system (Colasante, 2024), compared to recognising that each activity is determined by its singular object (Engeström, 1987/2015). Regardless, analysis of how actions contribute to and are differentiated from activities is not necessarily straightforward, with interconnections that rely on various historical, cultural, and social contexts (Clifford, 2022).

Second, an activity system in its dynamic form and as underpinned by associated principles of activity theory (Engeström, 2001) was considered a purposeful unit of analysis to use in this study. This is despite critique levelled at whether Engeström’s diagrammatic representation of an activity system is adequately used by researchers or even constitutes a unit of analysis.

Spinuzzi (2020) highlights a known issue in activity theory circles, that Engeström’s “graphical heuristic (the now-famous triangle) for picturing Leontiev’s activity system” (p. 10) is too often used at a descriptive level. Typically, this involves using the model, in both higher education (Bligh & Flood, 2015) and in other contexts (Virkkunen & Newnham, 2013), as a categorisation tool without exploration of developmental possibilities. Had the anatomy teachers’ activity in this current study not shown developmental potential – something the researcher could not guarantee at the time of recruitment in this study as designed – then use of the activity system as a unit of analysis may not have been as fundamentally useful. Spinuzzi (2020) notes that limiting use to an analytical or mapping device misses the opportunities for recognising the dialectical, interventionist, and codesign work potential to leverage participants’ tacit expertise. Through dialectic analysis of their workplace activity, the anatomy teachers’ insights provided past and present knowledge of their social system of their workplace practice to enable building a representative unit of analysis of how they envisioned a new way that their activity functions (Engeström, 2007). This does not imply that this process was easy. Researcher bias, compared to participant determination of their activity system and its object, did get in the way requiring layers of revisiting the data for further dialectical analysis (see Colasante, 2024).

Even in studies that go beyond a descriptive level of categorisation of activity system elements, the workplace developmental analysis of the actors might be missed. For example, Nguyen and Ha Van (2024) seek out contradictions in higher education contexts relatable to the current study. In Nguyen and Ha Van's study, they surface a range of legitimate challenges faced by university teachers during an institutional level transition to blended learning in a private Vietnamese university, to arrive at meaningful recommendations around improvements to guidelines, learning materials, assessment tools, and teacher professional development. Teaching challenges include finding new ways to organise and evaluate online sessions and monitor student progress. However, by aligning educator challenges to contradictions, Nguyen and Ha Van imply more than the routine practice annoyances presented, to signal a teacher developmental opportunity inherent in the change process which is not clarified. One challenge focuses upon a lack of guidelines for how teachers shift to a new way of teaching, leading to "inconsistent interaction patterns" (Nguyen & Ha Van, 2024, p. 20). This compares to the rules of the standardised pedagogical model that the anatomy teachers in the current study felt was imposed upon them, which the teachers adopted despite their dissatisfaction with this for anatomy teaching contexts. This rules-related contradiction manifested in a conflict of motives, which ultimately led to stimulating their development of new pedagogical models for their U2HA and U2AL subjects.

Blunden (2010) offers a layered critique of whether Engeström's activity system model can constitute a unit of analysis. On one point, Blunden appears to support an analytical mapping purpose for the model by acknowledging its usefulness for encouraging researchers to include key activity characteristics in their analysis. In his extended critique, Blunden (2010) poses arguments that the model is too complex to form a unit of analysis, given it is a "whole system" comprising components; a composite and not a unit of analysis but "an elegant general schema for various components of social life" (p. 232). In the current study in higher education contexts, using the activity system as a unit of analysis aided the conception "of teacher practice as a system of activity" and helped to "generate an account of how observable instantiations of practice, unfolding in the present, emerge from certain cultural-historical conditions (social, material and political) within which the subject is positioned as an agent" (Gale, Cross, & Mills, 2020, p. 54). Seeking a unit of analysis smaller than an activity system might imply that the constitutive elements each form units. However, any of the elements within the anatomy teachers' activity would make limited sense without the whole view of the functioning activity system unit. Recently, Engeström

(2024) restated the position of an activity as being "more than a mechanical sum of its components" (p. 18). This is consistent with analysis of human activity in a way that "does not break living activity down into elements" but should reveal "its inner relations" (Leont'ev, 1972, p. 28), makes the full contexts and conditions of the practice visible (Gale, Cross, & Mills, 2020), and analyses the "historical dimension" in order to view "more concretely" the successive forms of transition of the activity (Engeström, 1987/2015, p. 203).

Blunden's (2010) arguments, however, also focus upon whether the lower structure of an activity system forms "a satisfactory representation of the social context" (p. 232), including whether community and rules are matters of acceptance taken for granted by the individual actors involved. This is arguably a researcher bias-related challenge that needs attention, and through the lens of the current study might be addressed on two fronts. One is authenticity, including how much a researcher determines what constitutes the activity system under focus, including the lower socio-cultural part of the model, compared to having the practitioner participants represent how their activity exists. This paper primarily examines the first ethnographic phase of the research, and only a small part of the second workshop phase. In the field, the researcher drew upon observations of the activity, and participant recollections on the composition and development of their activity, including their relayed prior dialogues, actions, and interactions, that is, the slices of cultural detail shared. The codesigning and modelling of their solutions to the conflicts and contradictions that they encountered, to that pre-workshop stage, were conveyed in retrospect as a historical account (albeit in recent memory). The triangular activity system model was only shared with the participants in the second phase formative interventionist workshops for the teachers' collective and often dialectic input. The researcher, while aiming to authentically convey the anatomy teachers' experiences, made some missteps in appropriating what constituted the teachers' activity system, which required revisiting the participant voices in the data for further dialectical analysis (see Colasante (2024)).

Another front to address is individuals' acceptance (or not) of the community and rules, and not simply researcher determination of these components as if given. This is potentially the case in the Nguyen and Ha Van (2024) study on university blended learning. Overall, one activity system is implied, yet the elements are either compounded (e.g., heterogenous subject/actor grouping of "students, educators, and administrators" for the object of "successful implementation of blended learning", p. 20) or varied (e.g., object changing depending on subject/actor in focus). When

focusing on discussions that nominate the educators as the actors, the “community” is given as “the collaborative learning environment” and the “rules” as “institutional rules governing curriculum delivery” (Nguyen & Ha Van, 2024, p. 21). It is not clear whether the 11 interviewed lecturers, from a variety of disciplines, deliberated on what they conceive as constituting these elements in their activity and their acceptance or otherwise of these factors.

While the current study is not perfect (see Colasante, 2024), by using a unit of analysis to represent the anatomy teachers’ digital teaching practice in the ethnographic stage of the study, as discussed above, there was an attempt to interpret the teachers’ practice “in the wild” via observation, interviews, and artefacts, that is, in their regular workplace complete with organisational “rules, boundaries, and limitations” (Engeström & Sannino, 2012, p. 206). This allowed multiple individual voices to contribute their perspectives, including nominations by individual teachers of who they considered constituted their community. (This community identification led the researcher to approach U2HA and U2AL contributing teachers for voluntary participation, in Marcus (1995) styled ethnographic traces of following the people.)

In their expansive learning in the wild, the teachers engaged in un-facilitated “confrontation, contestation, negotiation, and hybridization between different perspectives and positions” to establish a united agentic position (Engeström, 2024, p. 30). Later, when the teacher-coordinators were invited in formative interventionist workshops to challenge the researcher drafted example model of their activity system, they again engaged in “confrontation and contestation as well as negotiation and blending” (Engeström, 2011, p. 611) to reset the visualisation of their activity to better represent their reality. The teachers also faced the added stimulus of the fieldwork data which provided different stakeholder views. They gave recognition to those in their activity community and edited the rules and conventions to represent those which guided their activity (see prior Figure 1, built via teacher deliberation).

Regarding adoption of the rules and conventions, the multivoiced data from the field evidenced the teachers’ initial adoption of rules from the boundary system of the university blended learning project, which (as aforementioned) the teachers did not agree with, and which limited their pedagogical modelling of their first-year anatomy subjects. By the time the teachers were in a position to reject or accept blended learning for their second-year subjects, U2HA and U2AL, they faced a conflict between these choices plus a further competing motive to employ

components of what worked well in blended learning for the visually rich discipline of anatomy (see top row of Figure 5, s6.2). The teachers refused to continue to work to the rules initially adopted from the project and instead decided to develop and adopt their own pedagogical models (e.g., “on our terms”, s4.1) and their own technological approaches (e.g., “we developed some of our own policies”, s4.2). The collegiate nature of the anatomy teaching team community, ethnographically evident, likely helped in their collaborative team pursuit to develop their agency through engaging in “dialectic, juxtaposing contradictory viewpoints or ideas to develop a common settlement”, compared to if they were a more disparate team with less favourable “social and peer production” contexts (Spinuzzi, 2020, p. 14).

6.5 Further research

In an age of increasing use of existing mediating technologies and continuous technological development, this study on the expansive learning experienced by one community of university educators calls for further research on explicitly enabling teacher agency within emerging technological contexts in higher education. For enacting change in teaching practices, there should be greater emphasis on affording teaching practitioners the opportunities to reconfigure and expand their own practice (Boud & Brew, 2013). One case context includes teacher agency in matters of artificial intelligence (AI). For example, since the 2022 release of the generative AI tool ChatGPT, conflicting perspectives have surfaced in higher education – such as the technology’s ability to positively facilitate equitable and personal learning versus negatively impacting academic integrity and job opportunities (Singh & Ngai, 2024). These and other conflicts of motives will arise as university teachers grapple with ways of implementing this technology into their teaching practices. In complex technological and emerging postdigital perspectives in university workplace environments, teacher agency will only become more important,

not only for designing and orchestrating meaningful learning activities but also for resisting institutional and political forces that use technology as a basis for streamlining, standardisation and efficiency, without considering how these changes manifest in the practices of students and teachers. (Fawns, 2019, p. 141)

While it may seem logical to state that universities must determine how to incorporate GenAI, and how to prepare teachers in critical and ethical literacies (Hartley et al., 2024), a top-down approach is not necessarily the answer. Compared to a top-down process, “a shared vision of how the digital initiative will be implemented” should take “into

account how decisions impact sociocultural constructs within the institution" (Gorrell, 2023, p. 10). Beyond insufficient resourcing in the ENU project, a shared vision was highlighted as a missing element in this project, as voiced by the teachers (e.g., the "why" not being "articulated to the staff who then had to enact the change", s3.1) and the central administrator (e.g., "[the change] may have seemed [unexpected]", s3.1). If a partially shared object had been determined between the teachers and the project administrators, some of the initial angst might have been avoided.

A teacher-agentic approach may be usefully applied from the start of a workplace change project. By the time of participating in this research project, the teachers had already come to believe that digital teaching was a good option. Working in discipline teaching teams and with others from boundary activity systems, the teachers enhanced their interpretations to collectively "strengthen purposeful responses to complex problems" and empowered collective expansive learning (Edwards, 2011, p. 34). This has potential practice implications for academic/faculty development in technology-enhanced learning practices, including the current focus on incorporating more complex emerging technologies such as GenAI into teaching activities. Further research might examine what contributing actions progressively build towards transformative and sustainable GenAI teaching practices, while positioning teachers as agentic actors.

7. Conclusion

This paper discussed the learning experiences of a team of university anatomy teachers, who experienced conflict during a workplace digitalisation project that sought to increase technology-enhanced learning. The teachers faced a university-led project advocating replacement of traditional lectures with digital learning options, which ultimately opened the door for them to change their teaching practice. During the process, their activity system for teaching moved into a state of instability ripe for re-tooling and re-configuration for digital teaching. However, with little direct control over the institutional policies that were affecting their practice, the anatomy teachers' initial compliance with the project left them dissatisfied with their changed teaching practice.

Through examining a range of the teachers' agentic actions which contributed to their expanded practice, this allowed for testing the metaphorical forward-anchoring framing of TADS (Hopwood et al., 2022; Sannino, 2022) within a specific higher education context. Analysis also

employed the action-activity hierarchy (Spinuzzi, 2002) and second-generation activity theory (Engeström, 2001) to examine teacher actions which became ongoing system stabilising actions of structural importance for their ongoing digital teaching activity. Some of these actions ultimately formed systems to become collective activities albeit auxiliary to the digital teaching system. This paper builds upon the work of others to offer an analytical mechanism to examine if and when a contributing action might become an auxiliary activity, and a method to illustrate how, in turn, such auxiliary activities influence the focal or supra-ordinate activity. This analytical mechanism is offered for testing and challenging in other higher education activities, particularly to test transferability or adaptability to other case contexts of teaching with established and emergent mediating technologies.

The immediate next step in this project involves publishing the findings from the formative interventionist workshops, where the anatomy teacher-coordinators participated in the second phase of the research and experienced a further cycle of expansive learning in Change Laboratory inspired workshops. This includes the teachers questioning and analysis of the iteration of their digital teaching practice shared in this paper, a process stimulated when they faced student data from the field, and how they modelled various solutions to engage their students more actively in the digital learning of anatomy (paper in development).

Additionally, a new research project is currently in design in another higher education technology-enhanced teaching context, involving the rapidly changing technology of GenAI in work-integrated learning in the business disciplines. The project draws from the anatomy teachers' experiences to pose questions around creating conditions in universities for fostering a teacher-agentic approach for discipline community teams to action their own bespoke pedagogical/teaching solutions for teaching practices with evolving digital technologies. Given a top-down, university-led approach is not always effective for executing digital transformation in teaching practices in higher education, compared to employing a more holistic approach that more actively involves teachers (Gorrell, 2023), this next project aims to support an agentic transformative professional development approach to foster university teachers' expansive learning to re-imagine the activity of teaching students how to use GenAI transparently and ethically in industry-partnered contexts. Activity theory researchers have a place to foster such teacher-agentic approaches, and to report on the outcomes, yet tackling the evolving issue of GenAI in teaching may take multiple projects to make a sizeable difference.

References

- Alvesson, M. (2009). At-home ethnography: Struggling with closeness and closure. In S. Ybema, D. Yanow, H. Wels, & F. Kamsteeg (Eds.), *Organizational Ethnography: Studying the Complexity of Everyday Life* (pp. 156-174). SAGE.
- Bligh, B., & Flood, M. (2015). The Change Laboratory in higher education: Research-intervention using activity theory. In J. Huisman & M. Tight (Eds.), *Theory and Method in Higher Education Research* (pp. 141-168). Emerald.
- Blunden, A. (2010). *An interdisciplinary theory of activity*. Brill
- Boud, D., & Brew, A. (2013). Reconceptualising academic work as professional practice: Implications for academic development. *International Journal for Academic Development*, 18(3), 208-221. <https://doi.org/10.1080/1360144X.2012.671771>
- Bowles, M., & Kaviani, A. (2023). Perceptions of teacher competencies in a new higher education blended learning programme: An exploratory study. *Studies in Technology Enhanced Learning*, 3(2). <https://doi.org/10.21428/8c225f6e.768acd6b>
- Chik, A., & Benson, P. (2021). Commentary: Digital language and learning in the time of coronavirus. *Linguistics and Education*, 62, 1-4. <https://doi.org/10.1016/j.linged.2020.100873>
- Clifford, S. (2022). The use and value of cultural historical activity theory in institutional educational technology policy. *Studies in Technology Enhanced Learning*, 3(1), 1-29. <https://doi.org/10.21428/8c225f6e.06989392>
- Colasante, M. (2022). Not drowning, waving: The role of video in a renewed digital learning world. *Australasian Journal of Educational Technology*, 38(4), 176-189. <https://doi.org/10.14742/ajet.7951>
- Colasante, M. (2024). Five methodological dilemmas when implementing an activity theory transformative intervention in higher education. *Teaching in Higher Education*, 29(7), 1736-1756. <https://doi.org/10.1080/13562517.2024.2367655>
- Colasante, M., Bevacqua, J., & Muir, S. (2020). Flexible hybrid format in university curricula to offer students in-subject choice of study mode: An educational design research project. *Journal of University Teaching & Learning Practice*, 17(3). <https://ro.uow.edu.au/jutlp/vol17/iss3/>
- Coles, R., & Thomson, P. (2016). Beyond records and representations: Inbetween writing in educational ethnography. *Ethnography and Education*, 11(3), 253-266. <https://doi.org/10.1080/17457823.2015.1085324>
- Cuban, L. (2001). *Oversold & underused; Computers in the classroom*. President and Fellows of Harvard College.
- Douglas, K., Lang, J., & Colasante, M. (2014). The challenges of blended learning using a media annotation tool. *Journal of University Teaching and Learning Practice*, 11(2), article 7. <http://ro.uow.edu.au/jutlp/vol11/iss2/7>
- Ebardo, R., & Suarez, M. T. (2023). Do cognitive, affective and social needs influence mobile learning adoption in emergency remote teaching? *Research and Practice in Technology Enhanced Learning*, 18(14). <https://doi.org/10.58459/rptel.2023.18014>
- Edwards, A. (2011). Building common knowledge at the boundaries between professional practices: Relational agency and relational expertise in systems of distributed expertise. *International Journal of Educational Research*, 50, 33-39. <https://doi.org/10.1016/j.ijer.2011.04.007>
- Engeström, Y. (1987/2015). *Learning by expanding: An activity-theoretical approach to developmental research* (2 ed.). Cambridge University Press.
- Engeström, Y. (1999). Expansive visibilization of work: An activity-theoretical perspective. *Computer Supported Cooperative Work*, 8, 63-93. <https://doi.org/10.1023/A:1008648532192>
- Engeström, Y. (2001). Expansive learning at work: Toward an activity theoretical reconceptualization. *Journal of Education and Work*, 14(1), 133-156. <https://doi.org/10.1080/13639080020028747>
- Engeström, Y. (2007). Enriching the theory of expansive learning: Lessons from journeys toward coconfiguration. *Mind, Culture, and Activity*, 14(1-2), 23-39. <https://doi.org/10.1080/10749030701307689>
- Engeström, Y. (2011). From design experiments to formative interventions. *Theory & Psychology*, 21(5), 598-628. <https://doi.org/10.1177/0959354311419252>

- Engeström, Y. (2016). Foreword: Making use of activity theory in educational research. In D. S. P. Gedera & P. J. Williams (Eds.), *Activity theory in education: Research and practice* (pp. vii-x). Sense Publishers.
- Engeström, Y. (2024). *Concept formation in the wild*. Cambridge University Press. <https://doi.org/10.1017/9781009030021>
- Engeström, Y., Nummijoki, J., & Sannino, A. (2012). Embodied Germ Cell at work: Building an expansive concept of physical mobility in home care. *Mind, Culture, and Activity*, 19(3), 287-309. <https://doi.org/10.1080/10749039.2012.688177>
- Engeström, Y., Nuttall, J., & Hopwood, N. (2022). Transformative agency by double stimulation: Advances in theory and methodology. *Pedagogy, Culture & Society*, 30(1), 1-7. <https://doi.org/10.1080/14681366.2020.1805499>
- Engeström, Y., & Sannino, A. (2012). Concept formation in the wild. *Mind, Culture, and Activity*, 19(3), 201-206. <https://doi.org/10.1080/10749039.2012.690813>
- Engeström, Y., & Sannino, A. (2021). From mediated actions to heterogenous coalitions: Four generations of activity-theoretical studies of work and learning. *Mind, Culture, and Activity*, 28(1), 4-28. <https://doi.org/10.1080/10749039.2020.1806328>
- Engeström, Y., Sannino, A., & Virkkunen, J. (2014). On the methodological demands of formative interventions. *Mind, Culture, and Activity*, 21(2), 118-128. <https://doi.org/10.1080/10749039.2014.891868>
- Fitzmaurice, M. (2010). Considering teaching in higher education as a practice. *Teaching in Higher Education*, 15(1), 45-55. <https://doi.org/10.1080/13562510903487941>
- Fawns, T. (2019). Postdigital education in design and practice. *Postdigital Science and Education*, 1, 132-145. <https://doi.org/10.1007/s42438-018-0021-8>
- Gale, T., Cross, R., & Mills, C. (2020). Researching teacher practice: Social justice dispositions revealed in activity. In J. Lynch, J. Rowlands, T. Gale, & S. Parker (Eds.), *Practice methodologies in education research* (pp. 48-62).
- Glazer, F. S. (2012). Introduction. In F. S. Glazer (Ed.), *Blended learning; Across the disciplines, across the academy*. Stylus Publishing.
- Gorrell, A. (2023). The impact of digital transformation on academic work. *Studies in Technology Enhanced Learning*, 3(2), 1-13. <https://doi.org/10.21428/8c225f6e.8efe18a1>
- Haapasaari, A., Engeström, Y., & Kerosuo, H. (2016). The emergence of learners' transformative agency in a Change Laboratory intervention. *Journal of Education and Work*, 29(2), 232-262. <https://doi.org/10.1080/13639080.2014.900168>
- Hamadi, M., & El-Den, J. (2024). A conceptual research framework for sustainable digital learning in higher education. *Research and Practice in Technology Enhanced Learning*, 19(1). <https://doi.org/10.58459/rptel.2024.19001>
- Hartley, P., Beckingham, S., Lawrence, J., & Powell, S. (2024). Using generative AI effectively in higher education. In S. Beckingham, J. Lawrence, S. Powell, & P. Hartley (Eds.), *Using generative AI effectively in higher education: Sustainable and ethical practices for learning, teaching and assessment* (pp. 1-7). Routledge.
- Hökkä, P., Eteläpelto, A., & Rasku-Puttonen, H. (2012). The professional agency of teacher educators amid academic discourses. *Journal of Education for Teaching*, 38(1), 83-102. <https://doi.org/10.1080/02607476.2012.643659>
- Hollands, F., & Escueta, M. (2020). How research informs educational technology decision-making in higher education: The role of external research versus internal research. *Educational Technology Research and Development*, 68, 163-180. <https://doi.org/10.1007/s11423-019-09678-z>
- Hopwood, N., Pointon, K., Dadich, A., Moraby, K., & Elliot, C. (2022). Forward anchoring in transformative agency: How parents of children with complex feeding difficulties transcend the status quo. *Learning, Culture and Social Interaction*, 33, 1-12. <https://doi.org/10.1016/j.lcsi.2022.100616>
- Huberts, R. (2017). Can video (created with PowerPoint and TTSAPP) replace "normal" lectures? In T.-C. Huang, R. Lau, Y.-M. Huang, M. Spaniol, & C.-H. Yuen (Eds.), *Emerging Technologies for Education (SETE 2017)* (Vol. 10676, pp. 116-124). Springer. https://doi.org/10.1007/978-3-319-71084-6_13

- Lawrence, B., & Lentle-Keenan, S. (2013). Teaching beliefs and practice, institutional context, and the uptake of web-based technology. *Distance Education*, 34(1), 4–20. <https://doi.org/10.1080/01587919.2013.770432>
- Lémonie, Y., Grosstephan, V., & Tomás, J.-L. (2021). From a Sociological Given Context to Changing Practice: Transforming Problematic Power Relations in Educational Organizations to Overcome Social Inequalities [Original Research]. *Frontiers in Psychology*, 11. <https://doi.org/10.3389/fpsyg.2020.608502>
- Leont'ev, A. N. (1972). The problem of activity in psychology. *Voprosy filosofii (Problems of philosophy)* (9 (Winter 1974-75, pp.4-33)), 95-108.
- Ludvigsen, S., Lund, A., Rasmussen, I., & Säljö, R. (2011). Introduction: Learning across sites; new tools, infrastructures and practices. In S. R. Ludvigsen, A. Lund, I. Rasmussen, & R. Säljö (Eds.), *Learning across sites: New tools, infrastructure and practices* (pp. 1-13). Routledge.
- Marcus, G. E. (1995). Ethnography in/of the world system: The emergence of multi-sited ethnography. *Annual Review of Anthropology*, 24, 95-117.
- Markham, A. N. (2018). Ethnography in the digital internet era: From fields to flows, descriptions to interventions. In N. K. Denzin & Y. S. Lincoln (Eds.), *The SAGE handbook of qualitative research* (5th ed., pp. 650-668). SAGE Publications.
- Mascolo, M. (2020). Transforming higher education: Responding to the coronavirus and other looming crises. *Pedagogy and the Human Sciences*, 7(1). <https://scholarworks.merrimack.edu/phs/vol7/iss1/2>
- Nguyen, H. T. T., & Ha Van, L. (2024). Challenges and implications of blended learning adoption in the age of communication technology: A case study of Vietnamese universities during the COVID-19 pandemic. *reFlections*, 31(3), 1144–1177. <https://doi.org/10.61508/refl.v31i3.276777>
- Pelias, R. J. (2018). Writing into position. In N. K. Denzin & Y. S. Lincoln (Eds.), *The SAGE handbook of qualitative research* (5th ed., pp. 659-668). SAGE Publications.
- Ranieri, M., Giampaolo, M., & Bruni, I. (2019). Exploring educators' professional learning ecologies in a blended learning environment. *British Journal of Educational Technology*, 50(4), 1673–1686. <https://doi.org/10.1111/bjet.12793>
- Rizvi, F. (2020). Re-envisioning higher education in Australia after COVID-19. *Higher Education in Southeast Asia and Beyond*(8), 31-34. https://headfoundation.org/wp-content/uploads/2020/11/HESB-8-COVID19_2020.pdf
- Sannino, A. (2011). Activity theory as an activist and interventionist theory. *Theory & Psychology*, 21(5), 571–597. <https://doi.org/10.1177/0959354311417485>
- Sannino, A. (2015). The emergence of transformative agency and double stimulation. *Learning, Culture, and Social Interaction*, 4, 1-3. <https://doi.org/10.1016/j.lcsi.2014.07.001>
- Sannino, A. (2022). Transformative agency as warping: How collectives accomplish change amidst uncertainty. *Pedagogy, Culture & Society*, 30(1), 9-33. <https://doi.org/10.1080/14681366.2020.1805493>
- Sannino, A., & Engeström, Y. (2018). Cultural-historical activity theory: Founding insights and new challenges. *Cultural-Historical Psychology*, 14(3), 43-56. <https://doi.org/10.17759/chp.2018140304>
- Sannino, A., & Laitinen, A. (2015). Double stimulation in the waiting experiment: Testing a Vygotskian model of the emergence of volitional action. *Learning, Culture and Social Interaction*, 4, 4-18. <https://doi.org/10.1016/j.lcsi.2014.07.002>
- Selwyn, N. (2007). The use of computer technology in university teaching and learning: A critical perspective. *Journal of Computer Assisted Learning*, 23(2), 83-94. <https://doi.org/10.1111/j.1365-2729.2006.00204.x>
- Selwyn, N. (2017). *Education and technology: Key issues and debates* (2nd ed.). Bloomsbury Academic.
- Singh, R. G., & Ngai, C. S. B. (2024). Topranked U.S. and U.K.'s universities' first responses to GenAI: Key themes, emotions, and pedagogical implications for teaching and learning. *Discover Education*, 3(115). <https://doi.org/10.1007/s44217-024-00211-w>

- Spinuzzi, C. (2002). Toward integrating our research scope: A sociocultural field methodology. *Journal of Business and Technical Communication*, 16(1), 3-32. <https://doi.org/10.1177/1050651902016001001>
- Spinuzzi, C. (2020). "Trying to predict the future": Third-generation activity theory's codesign orientation. *Mind, Culture, and Activity*, 27(1), 4-18. <https://doi.org/10.1080/10749039.2019.1660790>
- Taylor, J. R. (2009). The communicative construction of community: Authority and organizing. In A. Sannino, H. Daniels, & K. D. Gutiérrez (Eds.), *Learning and Expanding with Activity Theory* (pp. 228-239). Cambridge University Press.
- Tierney, A., Hopwood, I., & Davies, S. (2024). Staff and student experiences of hybrid teaching in a pandemic-impacted context. *Research and Practice in Technology Enhanced Learning*, 19(17). <https://doi.org/10.58459/rptel.2024.19017>
- Virkkunen, J. (2006). Dilemmas in building shared transformative agency (Dilemmes dans la construction d'une capacité d'action partagée de transformation). *Activités*, 3, 43-66. <https://doi.org/10.4000/activites.1850>
- Virkkunen, J., & Newnham, S. (2013). *The Change Laboratory: A tool for collaborative development of work and education*. Sense Publishers. <https://www.sensepublishers.com/media/1761-the-change-laboratory.pdf>

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About the author

Meg Colasante (PhD, SFHEA) is a lecturer in the College of Business and Law, at RMIT University in Melbourne, Australia. Following a background in teaching postgraduate courses in tertiary teaching practices and running projects in academic/faculty professional development, Meg currently teaches undergraduate business students in professional practice courses. Her research focusses on tertiary teaching and learning, especially towards innovations to improve student experiences involving curriculum design and/or educational technology, and university teachers as learners and agents for change within the higher education workplace. Meg completed her PhD, Co-constructing digital teaching practice in higher education: An activity theory perspective, in 2021 at Deakin University, Geelong, Australia.

✉ meg.colasante@rmit.edu.au

ORCID [0000-0003-4583-2858](https://orcid.org/0000-0003-4583-2858)

✉ [@meg_colasante](https://twitter.com/meg_colasante)

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