Liminality, uncertainty and troublesome knowledge in learning at work.

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Abstract

This chapter explores the learning generated through engagement with troublesome knowledge in changing work contexts. Liminality is integral to the post-qualification experiences of occupational groups profoundly impacted by disruptive societal changes. Workers in health services and in creative industries learn as they 'lean into practice' in situations over which the practitioner has little control. Liminal spaces are embedded in larger sets of relationships that influence the quality of learning in the work environment and the practices of day-to-day work. Affordances for learning, conceptual development and the construction of self-narratives play significant, interconnected roles in liminal learning and professional development, in changing circumstances.

Introduction

The essence of liminality is uncertainty. The concept is often used to describe key events during the life course when individuals (sometimes in peer groups) enter transitional phases from one social state to another. In educational contexts, liminal spaces occur when learners are confronted with new concepts and ways of thinking which hold the key to understanding disciplinary practice. These concepts and ideas disrupt existing understandings and render knowledge 'troublesome'. Mastering them allows the learner to move to another level in approaching topics and problems. In the post-liminal phase, students and practitioners are meant to emerge transformed in their knowledge and ability to advance in the field of activity, but the cognitive frame gives scant regard to the social, embodied and interactional aspects of learning that arise from the melding of cognition and affect elaborated by Damasio (2018). Liminal states have also been interpreted as psycho-social spaces and used in exploring 'learning journeys' of practitioners in which crossing thresholds is unsettling (Land 2014), leading to shifts in identity and potentially a sense of loss

In a broadcast radio discussion (4/8/21) between a newly qualified hospital doctor and an experienced doctor who had qualified some 20 years earlier , the new entrant talked of the strangeness of walking into the hospital setting as someone who was both the same as he was before, yet fundamentally different. He spoke of the uncertainty and insecurity he felt, of desperately wanting to be sure he was right in the decisions and actions he was taking minute by minute, of wanting to ask questions of people but being afraid to because he thought they expected him to know. His discussant, the experienced doctor, empathised and gently urged

him to 'lean into' the uncertainty and the support of his team. Not being sure is part of practice, however experienced you are, she explained.

Liminality is characterised as a temporary 'in-between' state, yet it has become an enduring feature of working lives. The notion of transformation through liminal learning is central to the construct of liminality. Drawing on its origins in classical anthropology, liminal learning has been characterised as taking place in a defined 'in-between' space into which we enter and through which we pass, emerging at the end point into the security of a new perspective, a new world view, a new identity, with doubts and uncertainties confronted and resolved.. The original anthropological notion of liminality has presumed end-points marking the stage at which experimentation ceases and the person is able to inhabit their new position in a way that meets socially defined expectations. Such linear concepts of transitions are weakened by changing norms and disrupted by changing circumstances, where end-points themselves become less predictable.

In liminal states, established ideas and practices are questioned and challenged. Troublesome knowledge is knowledge that poses challenges to existing ways of thinking, acting, and interpreting what lies before us, in ways that disrupt settled ways of understanding and doing things. Troublesome knowledge potentially leads to new ways of reading and making sense of the world. Yet what do we know about the role of knowledge in liminal learning in work settings?

Liminal learning entails 'learning how to go on' in life situations which are, in some important respects, unfamiliar us. Learning how to go on, in Wittgensteinian terms (Wittgenstein, PI 185 1953; Ginsborg 2020) means being able to work out what is the appropriate next step, in light of what has gone before.

Learning 'how to go on' becomes an increasingly troublesome process in liminal situations where the surround itself is changing. In exploring liminality in working lives, I draw on a series of research inquiries into how knowledge in its different forms (tacit, experiential, propositional, procedural, ethical) is put to work, focusing on situations that demand transformations of outlook, perspective and action.

Perspectives on liminality

Theoretical conceptualisations of liminality explore the relationships between 'in-betweenness' and transformation. Some approach liminality from the perspective of changes in perception, understanding and identity that liminality brings about; some focus on enactments of liminality in practice, while others emphasise the sites and spaces of liminality that structure the workings of liminality.

Taking these angles in turn:

Transformative learning

Changes in perspective and understanding are central to 'transformative learning' discourses. A conceptual approach to transformative learning focuses on 'threshold concepts' and transformational conceptual gateways that lead the learner to acquire new outlooks. This approach often focuses on changes in the perspectives of individuals that occur via educational interventions, notably in higher and adult education. In its approach to

troublesome knowledge and its resolution, transformative theory invokes the necessity of changes in meaning structures and sense -making. When a person's current meaning structure does not enable them to make sense of an experience, knowledge becomes troublesome and 'disorienting dilemmas' demand new ways of making sense of the experience. Learning how to go on entails finding re-orientations that enable progress to be made.

Changes in how we make sense of experiences are transformative not only when they influence how we learn to read the world but also in how they change our sense of self in the world. Liminal learning becomes liminal identity development (Beech 2011), facilitated through experimentation, reflection and self-questioning. Identity development also involves internalisation of others' expectations, as the doctor speaking in the opening extract suggests. Identity work includes struggles around confidence, or 'knowing that you can', not only when students are *becoming* practitioners (Rantatalo & Lindberg 2018) but also in continuing professional education.

Doing transitions

Perspectives that focus on 'doing transitions' connect with ideas of 'becoming' but extend beyond the learning individual to explore how transitions are socially shaped and produced. Inquiries focus on interrelations between the experiences and social practices of transitions, institutional regulation, and pedagogical action. Liminality, in this view, is associated with processes of coping in disorientating circumstances. Liminal learning and pedagogical action are included in the processing of transitions, which are studied longitudinally and, increasingly, across life domains.

Destabilising changes, where the end-point of transition is massively disrupted, can also be explored in this perspective. For example, in East Germany in 1989, young adults who had started their professional preparation under the structures of the communist regime had, suddenly, to make their way in labour markets of the 'reunified' Germany. Studying the transitional processes whereby entirely new scripts and routines have rapidly to be learnt (Evans, Behrens, Kaluza 2000) reveals, in stark terms, how expressions of agency are mediated institutionally. Macro- perspectives also come into view in the contexts of migrations, where refugees navigate transitions that entail new scripts and routines and pedagogical actions of adult education strive to offer significant mediation (Kersh et al. 2020).

Spatially-connected activities and practices

Practice theory conceptualisations of liminality explore how liminal spaces are constituted through enactment (Hopwood 2014) The idea of practice architectures (Kemmis 2008) has focused on dimensions of practice that link social and material spaces with enacting subjects and the activities that are performed in practice. In this perspective, liminal workplace experiences that entail 'learning how things are done here' can connect the practices and activities of new entrants and experienced workers across multiple social spaces, in 'trellises' of practices that support learning (Francisco 2017).

When workplace learning is equated with increasing participation in a practice, what happens when the practice is itself changing? This family of theories takes account of cultural and

socio-political dimensions and accommodates changing circumstances when the changes produce incremental changes in practice. How far they are able to explain the relationships between learning and practice where there is discontinuity and disruption in the practices themselves, is an open question.

Keeping multiple dimensions of liminality in view

The perspectives introduced so far struggle to keep in view all the dimensions they acknowledge to be significant. The explication of *how* workers learn loses focus on *what* is learned in both spatial and 'doing transitions' perspectives, while practice-based theories struggle, at the granular level, with turbulence in practice situations and with the dynamics of change over time (temporality). The transformative learning perspective focuses on individuals transforming how they understand their situations but tends to lose touch with complexities and proximal processes of practice in assuming that enactments of change will follow. Transformative learning assumes personal and collective agency while practice theory acknowledges agency. 'Doing transitions' emphasises a temporal role for agency through its emphasis on the forging of transitions beyond merely reflexive enactments. Each perspective illuminates some facets of learning, but none takes us very far in understanding how people become knowledgeable practitioners in the liminal spaces of work where the nature of the work and its contexts are themselves fundamentally changing.

What does knowledgeable practice mean in unpredicted and unpredictable contexts? How do the dynamics of uncertainty influence learning in liminal spaces and how can professional development be supported? How can transformations be achieved, for whom and what? How can our understandings of them take more fully into account the complexities of organisational, political, regulatory and cultural interdependencies - and how these change over time in social eco-systems? It is not my intention here to de-territorialise the field of inquiry (these established perspectives rarely talk to each other) nor attempt a comprehensive theory that bridges them, but rather to show how an approach previously used to explore knowledge recontextualisations in both pre- and post-qualification vocational learning can be elaborated to explore, through empirical encounters, the dynamics of practice and knowledge development in liminal spaces of learning at work.

How knowledgeable practice develops at work

Considering the role of troublesome knowledge in the liminal spaces of working life requires insight into how knowledgeable practice develops. The concept of knowledgeable practice (Evans 2015) enables us to focus on the practice while attending to the knowledge frameworks that underpin (1) the directing of work and (2) the exercise of judgment (Beckett & Hager 2000). Different forms of scientific, procedural, ethical, personal, experiential and tacit knowledge all come into play in the development of the knowledgeable practitioner.

Progress towards knowledgeable practice can be understood as a series of recontextualisations of the different forms of knowledge that people 'put to work' as they navigate the liminal spaces of working lives and work environments. Knowledge recontextualisations extend beyond making connections between theory and practice. Chains of recontextualisation are forged day-by-day as, for example people are stretched and challenged at work and exercise judgment in making decisions and taking action. These

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reworkings of knowledge are non-linear and differ, in scope and direction, according to points of entry into the liminal space.

The metaphor of the structured liminal space as a tunnel with a fixed start and end point is widely adopted. Liminality takes people into a tunnel from which they will emerge with new understandings and capabilities that are attuned to the environment at the end points of, for example, work entry or practice readiness. The linear assumptions of a liminal tunnel with a defined exit become increasingly problematic, when the possible end points are themselves shifting and no-one can predict what the 'new normal' might be.

Savin-Baden (2020) extends the tunnel metaphor to characterise it as rhizomatic – but the subterranean connotations remain problematic. Liminality in working lives involves reworking new perspectives in activities and in the relational practices that are fundamental to workplace learning. Moreover, transformational learning at work, building on Mezirow (1991), entails striving to understand situations, causes and effects while actively working to change them.

Transformational workplace learning is a profoundly agentic process, depending on social relationships that are generative of change amidst the socially reproductive processes of workplaces and institutions. For example, micro-interaction studies (Luff et al. 2010) show the influences of work organization on how people learn when cooperating in daily work tasks. People seek out and observe those who are 'knowledgeable' about activities; they can look for peer support; in focused workplace discussions; in practicing without supervision, in searching out information, ideas and solutions (Taylor and Evans, 2009). Professionals engage with each other with varying degrees of intentionality to develop their practice. This development takes both adaptive and productive forms, as professionals strive to adapt their practice to changing situations and to produce creative responses to unpredictable circumstances or problems for which identifiable solutions are not readily available.

Work practices draw on knowledge frameworks, both explicitly and tacitly. Existing knowledge becomes troublesome as soon as new limits to its applicability become apparent. Such situations are generative of fresh knowledge and insights, and transformative potential is realised in altered practice.

Recontextualising knowledge through action

The development of knowledgeable practice has been investigated through a series of inquiries into the part played by knowledge recontextualisation in agentic processes of learning. This approach (Evans, Guile, Harris and Allan 2010; Evans 2017) shows how knowledge generated and practiced in specific contexts can be recontextualised in ways that change both practices and contexts. This version of recontextualisation has substantially expanded perspectives of Bernstein (2000) and van Oers (1998) to embrace the ways in which adults themselves change as they 'put knowledge to work', reworking concepts and practices, and developing new professional identities.

The ways in which knowledge is put to work in and through work activity are differentiated by role and occupational field. Practitioners draw on and combine different forms of knowledge (propositional, personal, procedural, tacit, experiential) as they move between sites of learning and practice, continuously reworking knowledge in liminal spaces and

developing the attuned judgments associated with knowledgeable practice.(Beckett and Hager, 2000). Support and resources for learning are needed to be able to move from established ideas towards new ones in work contexts. According to Ellström (2001) employee involvement in workplace development and innovation means moving beyond adaptive learning towards developmental learning, usually as part of rather controlled processes.

Knowledge recontextualisation takes place when the practitioner recognises a new situation as requiring a response and uses knowledge, in all its forms, in acts of interpretation that, in van Oers' (1998) terms, attempt to bring the activity and its setting under conscious control. In the enactment of well-known activities in new settings, adaptive forms of recontextualisation takes place as existing knowledge is used to reproduce a response in parallel situation. Where the interpretation leads the learner to change the activity or its context in order to make a response, a productive form of recontextualisation takes place. The limits to the following of rules and enactments of existing roles become apparent, the reworking of knowledge becomes troublesome and new knowledge is produced in learning how to go on. Liminal learning in disrupted environments thus moves beyond development to entail knowledge production, as existing knowledge becomes troublesome in more profound ways and requires complete shifts of perspectives and conceptions of what practice actually is and what the possibilities might be.

How does knowledgeable practice develop as knowledge becomes troublesome and disorienting dilemmas occur, as end points of the liminal state themselves become ambiguous? These processes can be illuminated by considering contrasting examples that explore the relationships between knowledge, practice and agency in contexts of uncertainty.

Example: liminality and learning in nursing (public sector professionals)

Newly qualified nurses (NQNs) in the National Health Service (NHS) of the UK work as fully accountable practitioners in hospitals, during a structured liminal period of 'preceptorship' intended to support and build confidence (Muir 2013). In its original form, this liminal space is intended to move the new entrants from the capabilities and identities of the graduating student nurse towards the capabilities and identities associated with knowledgeable practice, working through a period of self-doubt to emerge in a new place of self-confidence. The in-between phase is characterised by uncertainty and contradiction, as NQNs assume authority as fully fledged nurses but continue as learners. Reworking of knowledge takes place continuously and thereby the process of liminality becomes potentially transformative.

Delegation and prioritisation are among the threshold concepts, embedded and embodied in practice, that newly qualified nurses find troublesome (Allan et al 2016). In negotiating liminal spaces, they come to better understand the tacit 'rules of the game' as their ways of thinking about practice are potentially transformed (Land et al. 2014). In liminal spaces they recontexualise and rework what they know, think and feel to emerge with new perspectives regarding themselves, and how they are regarded by others. But existing accounts do not take account sufficiently of constantly shifting circumstances nor the tensions inherent in striving for means and ends that are beyond mere compliance.

Newly qualified nurses learn to enact established workplace practices and procedures, in *adaptive* forms of knowledge recontextualization. They also modify their responses in the search for solutions to unexpected occurrences or in the light of experiences of mistakes they,

or others around them, have made. They learn through this process to develop their judgment of what constitutes safe practice, enacting that judgement through processes of effective prioritisation and delegation in providing care. Learning through difficult experiences and through mistakes is associated with *productive* forms of knowledge recontextualisation, while defensive practices can sometimes be traced to difficult experiences that have not been fully worked through with supportive de-briefing.

In frequent accounts of 'muddling through', NQNs adapt existing knowledge of many different types to respond, in the contingencies of the present moment, to multiple pressures and demands. Their responses are contextualized in the routines and protocols of record keeping, patient confidentiality and safety checks. They are also modified according to workplace relations and the organisational hierarchies that influence how NQNs communicate with health care assistants, doctors and their mentors. Knowing when, how and with whom to communicate in an emergency or unpredictable situation can be critical to the outcome. The NQN incrementally builds knowledge of how to work with protocols and manage workplace relations in clinical practice (Allan el al 2016).

NQNs want to emerge from the liminal space as knowledgeable practitioners capable in their own eyes and recognised by the ward team as capable of managing a ward section and eventually a shift. This liminal process entails learning to manage their authority as part of the agentic process of professional identity development. Yet this sought-after unambiguity on exiting the structured liminal space of preceptorship is never fully achieved. Developing one's professional's identity may be better thought of as an undertaking rather than an accomplishment (Allan and Evans 2022). It requires flexibility in thinking and an ability to tolerate confusion before understanding (Savin-Baden, 2020: 46), intensified by competing discourses about nursing roles and responsibilities (Drevdahl and Canales, 2020).

Liminality also occurs in the role changes throughout working life. In an (experimental) multi-disciplinary unit that was designed fundamentally to reshape working roles and practices, experienced nurses often constructed moral narratives justifying the changes in terms of improved patient experience and comfort. They showed a propensity to theorise in practice, a form of liminal learning in the face of huge organisational changes (Allan and Evans 2022). Acts of interpretation and productive workplace recontextualization arose daily for these experienced healthcare professionals, in the midst of role changes, service reorganisation, restructuring and, in some cases, redundancy. In common with newly qualified nurses, they theorised about their professional identity and questions of purpose and leadership in these newly-constituted multi-professional teams.

In changing circumstances, the boundaries of the liminal space become less defined by mastery of existing protocols, and more defined in terms of capabilities to make effective responses in unpredictable situations. In times of disruption (e.g. under pandemic pressures) the liminal space continuously changes shape under extreme pressures to find the best available responses in situations in which so much is unknown and unknowable.

Example: liminality and learning in 'free-lance' or short-term contract-based work

The public sector scenario of highly regulated practice has stark contrasts with the insecurities of free-lance work in technical occupations in creative industries. For workers

who have multiple clients, a work-pattern of entering into new contracts and moving between sites of working becomes a way of life (Bound et al. 2019). Knowledgeable practice entails capabilities to read each situation anew, understanding not only the requirements of the task-in-hand, but also the expectations of each new employer, supervisor, team leader and team of co-workers.

Troublesome knowledge, in this context, is knowledge that demands new ways of making sense of what the contract-based workers observe and experience in situations that are constantly shifting. Repeated encounters with troublesome knowledge define the work of free-lancers, with little prospect of settled end-points where ambiguities disappear. The liminal space is continuously stretched and reformed.

Cameramen learn about the latest technology by reading relevant manuals and viewing demonstrations on 'you tube'; they develop judgment about light and aperture through trial and error. Helping each other out on-site provides opportunities for practice and learning about other roles (e.g. lighting, key grip, sound) as well as evaluating the potential for new team members. All these features entail the capacity to access knowledge and ways of working from diverse channels and to 'recontextualise' them in changing work settings. Experimentation and improvisation are important elements. For example, a 'key grip' describes how he adapts prior knowledge of physics in order to experiment with new camera angles (such as the suspension of the camera by a rope). Mimicry also features in accounts of learning that emphasise observation of others, for example, cameramen who are known to be expert in specialised ways.

At what point do adaptive recontextualisations become the productive, transformational knowledge reworkings of liminal learning? When learning through mimicry is synthesised to produce an individual style – a kind of signature on your work – knowledge recontextualistion becomes productive and potentially transformative. Other examples highlight the capacity to 'think on your feet' as an essential ingredient of becoming a knowledgeable 'soundman', who commented: 'it's a job where you have to think on your feet. You have to work things out in your head you know, like why we are having this problem.' The subject knowledge of acoustics is recontextualised to the problem at hand; the know-how and procedural knowledge are simultaneously reworked. The accounts of knowledge use transcend the specificities of the activity to emphasise the meta-level: the importance of critical abilities to 'read' situations quickly and knowing how to navigate shifting and often unpredictable contexts of free-lance work.

Knowledge is sometimes troublesome when 'you don't know what it is you don't know'; at other times, it is troubling when you are aware of what it is you lack. Consider the lighting engineer for whom this troublesome knowledge came in the form of recognition that he did not have the knowledge needed to do what he saw 'these other guys doing'. He wanted to do and be these things (and more) himself and set out to learn not just the tasks but to extend his capabilities. He described curiosity-driven learning, for example in understanding what lies behind how the light works. He started to specialise, in lighting, then in sound, then in rigging. Rigging so challenged him that he embarked on a process of learning new mathematical concepts.

The freelancer positioned himself as a constant learner, able to 'see' and participate in different roles and practices, actively seeking knowledge that demanded new perspectives and responses. This case was, in some ways, exceptional. While encounters with troublesome

knowledge triggered development for some workers, for others they were sources of unresolved frustration and de-motivation.

Varied freelance work requires swift moves from adaptive to productive recontextualisations as meta-cognitive strategies are applied in the constant reproduction of self at work. This is a liminal process in which organizational bounds are negotiated towards outcomes that have an element of co-production. The agentic worker negotiates the affordances of the profession as well as those of the workplaces to which they are attached. Conversely, where low- graded routine work entails little other than repetitive adaptive processes, development opportunities may be so restricted that atrophy of existing capabilities is a possibility.

Becoming knowledgeable practitioners in contexts of uncertainty

So far, I have argued that workers recontextualise knowledge as they navigate liminal spaces. Existing knowledge (in all its forms) becomes potentially troublesome as uncertainty grows. Striving for feelings of capability and control in the present moment is ever present. That Wittgensteinian sense of seeking 'how to go on' is reflexively and iteratively connected with the feelings of capability that come with knowing, with confidence, how or what to do next. This process is inherently troublesome. In changing circumstances, sought-after unambiguity on the other side of the liminal space is never fully achieved. Becoming a knowledgeable practitioner in changing circumstances means managing liminality as a recurrent feature of practice and learning.

I have argued that, for NQNs, liminal space is where multiple knowledge recontextualisations take place. The developmental nature of this process is recognised and supported by co-workers and supervisors. There are expectations and demands placed on NQNs that they will move out of this space fairly quickly to become competent and safe practitioners on whom the team can rely.

Freelancers, by contrast, are expected to be ready to perform in any given situation immediately on hiring. It is their existing expertise that is being bought by the employer. Yet in practice their competence is constantly stretched in liminal situations where they are having to read anew what is expected and required of them.

Fundamental shifts in circumstances bring the experiences of these two groups closer together. Intensification of adaptive knowledge recontextualisations combined with the productive knowledge recontextualizations of liminal learning demand rapid assimilation in situations over which the worker has little control. Affordances for learning matter, with conceptual development and self-narratives playing key roles.

'Leaning into' practice

Both groups have to 'lean into practice' (Bound et al 2019) as they put knowledge to work. Both NQNs and contract-based workers are relatively powerless to do other than to 'lean into' the practices of their worksites. Having to be 'malleable' and having the ability to 'swallow your pain' are examples of expressions used by freelancers as they describe the pressures of having to fit the requirements of multiple contractors and tasks, to sustain work and survive in the profession. ('The more you swallow the pain the more jobs you will get').

The freelancers also explain how they are expected to be competent at the point of hire – the employer is buying your competence so trial and error learning cannot be overt.

In nursing, post-qualification practice development is predicated on leaning into practice, with full accountability under supervision. While this might appear to be a structured learning process, it is not unusual for a nurse to encounter just one episode of a condition or procedure during three years of education and still be expected to demonstrate competence in a range of clinical situations. Workplace pressures and the pre-eminence of patient safety rule out 'trial and error' as a learning strategy and the fast pace of the work relies on competency at crisis points, not learning. Encounters with troublesome knowledge are not worked through. Hierarchical relationships between NQNs and mentors put pressure on experienced staff to model competence and capability rather than admit to the uncertainties that inspire continuing learning (Allan and Evans, 2022).

Land et al. (2010) described how the search for routines in liminal spaces often takes the form of mimicry. Mimicry is a safe behaviour used by both nurses in hospital ward teams and freelancers in project teams. In shifting circumstances, mimicry is inadequate. We look to people whose judgment we trust as knowledgeable practitioners – not to mimic them but for support in the new sense-making that is an essential part of transformative learning.

Recontextualising (reworking) knowledge is subject to proximal and distal influences. Leaning into practice in work sites emphasizes the proximal but is strongly influenced by the distal. In organizations, interdependencies of interests play out as senior managers exert influence not only over working conditions but also over the culture of an organization and the affordances and support it might provide for workplace learning.

Affordances and support

Affordances for liminal learning are in-built structurally in nursing contexts that have formal 'preceptorship' periods. They are also present informally in the relationships between NQNs and clinical colleagues. There are no formally-provided support functions for freelancers, but there are affordances for learning in all contexts. Some practitioners recognise affordances more readily than others, observing knowledgeable workers; questioning and inquiring, searching for information, seeking out support.

The agentic worker negotiates the affordances of the profession as well as those of the workplaces to which they are attached. but the potential atrophy of skills that comes with low- graded repetitive routine work is attributable to the work environment, not to worker shortcomings. A focus on liminal learning and knowledgeable practice development should not divert attention from improvements to work practices. For both groups, opportunities for learning and professional development require quality mentoring and educational spaces, outside and beyond daily pressures, that can facilitate productive responses to demands, pressures, frustrations and contradictions in day-to-day work.

Threshold concepts

In the literature of higher education, threshold concepts have to be mastered by liminal learners if they are to transform understandings and emerge with a different perspective. For example, 'gravity' is a threshold concept in the physical sciences, 'opportunity costs' a

threshold concept in economics and the 'social construction of reality' a threshold construct in sociology.

In work contexts, threshold concepts are most evidently at play in work process knowledge. Concepts are embedded in practice; their meaning changes according to the contexts of use. For example, the practices of blood pressure measurement lead NQNs to an understanding that this is not a single concept but a multi-faceted construct (Allan and Evans 2022). Prioritisation and delegation processes that feature so strongly in the liminal learning of NQNs are threshold concepts in which both meaning and practice are grasped simultaneously in response to situational demands. In freelance technical work in film and TV, concepts in which meaning and practice have to be grasped simultaneously are often associated with reworkings of mathematical and physical concepts in, for example, camera work, lighting and rigging. In work process knowledge, the understandings behind the use of the metaphors of 'malleability' and 'self-presentation' also entail threshold conceptualisations that leads the freelancer to a new perspective: 'I worked really hard to understand self-representation' (freelance lighting technician).

Land et al. imply that threshold concepts are transformative and irreversible. However, the evidence from inquiries into nursing and freelance technical occupations emphasise that concepts, integral to practice, are continuously recontextualised as practice varies from ward to ward, from workplace to workplace, from assignment to assignment. As practitioners refine their abilities to judge situations that require their response, transformation occurs not by one-way movement through a conceptual gateway, but rather through an iterative process.

Self narratives

In liminal states, crossing thresholds is unsettling, leading to shifts in identity. Learning is also social and embodied, developed through daily interactions and construction of self-narratives.

Self-narratives refer to identities that are reflexively constructed in internalized stories of the self that provide a rationale and a sense of purpose. Self-narratives of freelancers gave them permission to pursue this way of life. For nurses, the self-narrative of long-term professional commitment was intertwined with a moral narrative of obligation to enhance patient safety and well-being and respond selflessly in crises. The power of self -narratives was demonstrated, in both groups, in how people continue to learn in the most dispiriting of situations.

Becoming a knowledgeable practitioner in changing circumstances connects the liminal processes outlined above. As workers expand their experience by 'leaning into practice', the self-narrative (of self in relation to changing context) becomes important in seeing possibilities and working through troublesome knowledge.

Conclusions

I have discussed how practitioners rework knowledge within liminal spaces and what the process of becoming knowledgeable practitioners means in changing and uncertain contexts. as practitioners develop their capacities for professional judgment.

Where liminal spaces are generated in workplace environments the tunnel and gateway metaphors lose much of their salience as liminality, self-evidently, entails multiple forms of knowledge that are embedded in workplace practices. The shape and properties of the liminal space are strongly contextualized and experiences within them are relational. Changing circumstances augment the liminal space and intensify the incidence of troublesome knowledge. Roles and relationships are continuously revised and re-enacted. Liminality is shown to be ontological and multifaceted, embodying the melding of cognition and affect that underpins all human striving (Damasio 2018).

A 'long view' of learning is inherent in liminality. Viewing learning as a liminal activity deepens understanding of how learners rework knowledge and put multiple forms of knowledge to work, as they form and reform professional identity across a working life. Furthermore, permanent liminal learning becomes a feature of working lives in changing circumstances. Barnett and Jackson's (2020) notion that rich ecologies of learning are integral to living 'on the edge' rather than in-between fixed states, highlights transformative possibilities. Yet edginess can be overstated. Extending the biological metaphor, in the social equivalent of homeostasis (the condition that regulates human functioning within the range that makes possible not only the survival but also the flourishing of life) sense-making and the exercise of attuned judgment (Beckett and Hager 2000) should ensure that transformations are consistent with both viability and the potential to flourish.

While the central idea of the structured liminal space is that people will emerge from liminal learning transformed in their knowledge, the idea that recontextualisation occurs every time a person learning in a new or changing environment encounters and acts on new knowledge, has resonances with Van Gennep's original idea of liminal spaces:

 'For groups, as well as individuals, life itself means to separate and to be reunited, to change form and condition… It is to act and to cease, to wait and rest, and then to begin acting again, but in a different way.' (Van Gennep, [1909], 1960, 189)

The reflexive processes of negotiating intensifying pressures, requirements and expectations of a regulated profession in a Hospital Trust differ profoundly from the constant re-inventions of the self that characterize free-lancers' contract-based work. The limits of rule-following and role re-enactment strategies are apparent in both scenarios as practitioners strive to learn 'how to go on' in the face of unprecedented challenges (Ginsborg 2020). Further variation occurs as practitioners put their unique configurations of knowledge and experience to work and differ in their perceptions of possibilities as circumstances change.

In liminal spaces, perceived 'ends' and 'means to ends' are reworked through engagement with threshold concepts of the field and the construction of self-narratives, as practitioners lean into the challenges of changing practice. Can professionals be prepared and supported for recurrent experiences of liminality in their working lives? In public sector nursing, liminal spaces recur throughout structured careers. Allan and Evans (2022) suggest that nursing curricula, which in England have been slow to evolve in response to changing circumstances, could go with the grain of nurses' propensities to theorise in practice, countering anti-intellectual stances and creating educational spaces through which nurses can make sense of learning in apparently 'disintegrated' practice scenarios. For free-lance workers, Bound et al. (2019) have posited the need for an integrated practice model, in which coordinated enactment of technical and aesthetic expertise, meta- learning capabilities and enterprise is explicitly developed through initial and continuing professional education curricula.

While productive knowledge recontextualisations can remake practices, learning in changing circumstances involves 'leaning into' forms of practice that are often pressured and demanding, controlled in ways that are beyond the power of the individual, in the present moment, to change. These realities bring the potential of enhanced socio- ecological perspectives into view for future inquiry. Enhanced social ecological understandings of liminal spaces for learning can uncover the dynamics of uncertainty. Liminal spaces are embedded in larger sets of relationships that influence the quality of the work environment and the practices of day-to-day work. The organisation of production; professional, industry, and workplace discourses; funding and industrial relations; and industry susceptibility to disruptive change, along with a worker's own sense of agency, are all reflexively influenced in ecologies for learning and the development of knowledgeable practice. Keeping in view organisational, political, regulatory and cultural interdependencies - and how they change over time - enables us to reimagine possibilities for development as the fragility of ecosystems becomes ever more apparent.

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