Lifelong Learning Book Series 27

Helen Bound
Jennifer Pei-Ling Tan
Rebekah Lim Wei Ying *Editors*

Pedagogies for Future-Oriented Adult Learners

Flipping the Lens from Teaching to Learning

Springer

Lifelong Learning Book Series

Volume 27

Competing visions and paradigms for lifelong learning co-exist at national as well as international levels. The fact that one 'official' discourse may be dominant at any one time does not mean that other ways of thinking about learning throughout the life course have disappeared. They are alive and well in a range of critical traditions and perspectives that retain their power to engage and persuade.

In this series, contributors critically analyse issues in lifelong learning that have important implications for policy and practice in different parts of the world. Evidence, ideas and the polity can mobilise political thinking in new directions, as policy makers search for the new 'big idea'. In turbulent times, ideas for better connecting system worlds and life worlds in the pursuit of broader and more just forms of meritrocracy can focus compellingly on learning as a lifelong process which links, rather than separates, the older and younger generations and incorporates the realities of working lives.

The series aims to engage scholars, practitioners, policy-makers and professionals with contemporary research and practice, and to provoke fresh thinking and innovation in lifelong learning. Each volume is firmly based on high quality scholarship and a keen awareness of both emergent and enduring issues in practice and policy. We welcome work from a range of disciplines and, in particular, inter- and multi-disciplinary research which approaches contemporary and emerging global and local challenges in innovative ways. Through advocacy of broad, diverse and inclusive approaches to learning throughout the life course, the series aspires to be a leading resource for researchers and practitioners who seek to rethink lifelong learning to meet the challenges and opportunities of the 21st Century.

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Helen Bound • Jennifer Pei-Ling Tan
Rebekah Lim Wei Ying
Editors

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Editors
Helen Bound
Institute for Adult Learning
Singapore University of Social Sciences
Singapore, Singapore

Jennifer Pei-Ling Tan
Learning & Development Group Human Resource
OCBC Bank
Singapore, Singapore

Rebekah Lim Wei Ying
Teaching and Learning Centre
Singapore University of Social Sciences
Singapore, Singapore

ISSN 1871-322X ISSN 2730-5325 (electronic)
Lifelong Learning Book Series
ISBN 978-3-030-92866-7 ISBN 978-3-030-92867-4 (eBook)
https://doi.org/10.1007/978-3-030-92867-4

This Springer imprint is published by the registered company Springer Nature Switzerland AG
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

Foreword: Series Editors' Note

The Lifelong Learning Book Series was launched in 2004 and by 2021 had published 27 volumes on topics of international significance. In this latest phase in the life of the series, we aim to engage our expanding, international readership in 'Rethinking Lifelong Learning for the 21st Century'. Lifelong learning debates are refreshed and renewed when scholars bring fresh perspectives and critical analyses of emergent and enduring issues in lifelong learning that have important implications for policy and practice around the globe.

In selecting books for the Lifelong Learning Series, we recognise that competing visions and paradigms for lifelong learning co-exist at national as well as international levels. The fact that one 'official' discourse may be dominant at any one time does not mean that other ways of thinking about learning throughout the life course have disappeared. They are alive and well in a range of critical traditions and perspectives that retain their power to engage and persuade. Evidence, ideas and the polity can mobilise political thinking in new directions, as policymakers search for the new 'big idea'. In turbulent times, ideas for better connecting system worlds and life worlds can focus compellingly on learning as a lifelong process which links, rather than separates, the older and younger generations and incorporates the realities of working lives.

The contributors to this volume, *Pedagogies for Future-Oriented Adult Learners: Flipping the Lens*, argue for a re-orientation of pedagogy in adult education to emphasise the aspirations, circumstances and needs of adult learners. They focus particularly on practices in work-related adult learning, but the issues raised and the approaches explored are clearly relevant to learning throughout the life course. Placing learners and the processes of learning at the heart of education, both formal and informal, is clearly not new, with multiple iterations of, for instance, student-centred and self-directed learning over the years. The need, however, to fundamentally re-think how we learn, what we learn, where we learn and for what purposes we learn has, arguably, never been so urgent, most notably in the light of responses to, and the ongoing impact of, the Covid-19 pandemic and the growing imperative to

address the escalating global climate crisis. This is signalled clearly by the emphasis in this volume on being 'future-oriented' and attending to the complex and dynamic entanglement of self and context in the development of ways of understanding learning and designing and implementing approaches to learning that empower learners in shaping the future. The collection both explores how we conceptualise learning and how these forms of learning unfold in practice in particular contexts.

This volume makes a distinct and timely contribution to the series. What started as an opportunity to bring together contributions from across the globe to make an argument for learner focussed pedagogies fitting for future-oriented learning has become, in our current and emerging circumstances, an imperative for action in fostering forms of lifelong learning that are challenging, sustainable, meaningful and able to have a positive impact on our collective and entwined human and more than human global prospects.

Series Editors
Andrew Brown and Karen Evans
UCL Institute of Education, London
Lifelong Learning
November 2021

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Chapter 1
Introduction: Flipping the Lens from Educator to Learner

Helen Bound

Abstract There is growing demand for change in adult education, be it community, vocational, or higher education. Specifically, there is a need to put learners and learning at the centre of our pedagogical practices. Developing future-oriented learners requires shifts in how, educators position themselves, how institutions support them and how learning is understood and designed. This chapter introduces metaphors of learning as an organising principal for thinking about learning, and about teaching and learning practices. These metaphors can be a useful framework for considering the chapters in this book. Developing future-oriented learners demands that learners are actively engaged in learning, in ways beyond group discussions and projects. Future-oriented learning demands that learners' voices are not just heard but valued as co-constructors of knowledge, of bringing rich life experiences to the table. This changes the role of educator to one of challenger, of guide and access to resources, of ensuring a safe and trusting environment. This is not new, but when accompanied by the different ways of thinking about learning fore fronted in this collection, richer, deeper dimensions are given to these shifts in power relations to empower our learners. This chapter also introduces the three section of this book, and their Chapters.

Keywords Learner · Learning · Educator · Future-oriented · Flipping the lens

There is growing demand for change in adult education, be it community, vocational, or higher education. Specifically, there is a need to put learners and learning at the centre of our pedagogical practices, away from the traditional transmission and acquisition (Sfard, 1998) approaches. The urgency of such change has been accelerated through the experiences of the pandemic world that we live in. Learners are voting with their fingers as they switch off, engaging in online shopping, responding to emails, and the like, during online learning involving long hours of one-way talk from the lecturer/trainer (Tan et al., 2021).

H. Bound (✉)
Institute for Adult Learning, Singapore University of Social Sciences, Singapore, Singapore
e-mail: helen_bound@ial.edu.sg

H. Bound et al. (eds.), *Pedagogies for Future-Oriented Adult Learners*, Lifelong Learning Book Series 27, https://doi.org/10.1007/978-3-030-92867-4_1

The necessity for a shift in pedagogical practices from transmission methods to learner and learning focussed is not only to enable powerful learning but also as a means to add value to the work of educators. Those who persist with transmission approaches are likely to find themselves displaced by artificial intelligence and advanced technology. The changing nature of the work of educators is evident through digital transformation, policy changes, the pandemic, global distribution of work, changing value chains and new players entering the market (e.g. Ed Tech players, corporate universities and more). The adult education, higher education and vocational educator sectors (hereafter referred to as adult education) are responding to sector transformation as a duality; first the impact on the sector itself and second, in every sector adult education supports. Adult education must pay attention not only to change on multiple and increasingly overlapping fronts, as it seeks to respond to and pre-empt emerging needs in the sectors it supports.

The adult learners who are the protagonists in this book are, for the most part learning in, through or for work. This might include learning through everyday work activities, or undertaking courses as part of their continuous professional development. Adult learners might be engaged in a variety of different professions from being cooks in a restaurant chain attending a half-day training to learn how to cook a new dish; be network engineers attending a five-day course offered by a private provider to learn how to solve network problems; to human resource personnel, teachers, or team leads from enterprises in different industries undertaking a Masters' programme; to a self-employed film producer learning from a mentor how to shoot both creatively and efficiently to make a living and many other possible scenarios. Adult learners have multiple responsibilities, and roles, juggling study/self-development, family commitments, career and/or advancement challenges and opportunities, health issues of their own or of family members and much more.

At different life stages, adult learners have different life purposes and foci. For example, 50-year-old Joyce was working as a property agent while learning to be a therapy assistant. As she was getting older, she wanted to pick up some therapy skills to better enable her to take care of her elderly family members, and also herself in the future. Tony (45 years of age) was working as a technician providing equipment for schools for children with special needs. He noticed there were groups of children in need of more help and support, inspiring him to become a therapy assistant after he was retrenched from his previous job. Given that individuals' needs change over time, and under different circumstances, and that the meaningfulness of learning for adults depends on how learning is related to their personal, social and economic contexts (Taskforce on the Future of Adult Learning Research, Singapore, 2020), it makes sense to design learning that places the learner(s) and their learning at the centre.

The sub-title of this book, 'Flipping the Lens from Educator to Learner' is simply another way of saying we need to put learners and learning at the centre. This idea is not new and has been around for some 50 years in higher education in various permutations, from behaviourist approaches to personalised instruction in the 1950s to 1960s, to humanist self-directed learning (or more appropriately, negotiated learning), and constructivist problem-based learning in the 1970s–80s, to

work-based learning partnerships since the 1990s (Boud, 2012). Boud (2012) observes that the term student-centred learning is an over and oft-used term by the likes of vice-chancellors to the point where the term "has lost any sense of useful meaning, except in the very general sense of being somewhat student-oriented" (p. 59). However, putting learners and learning at the centre is now driven by an expanded understanding of learning as compared to what took place in the last century. Additionally, student-centred learning is not only the province of higher education but also the realities of the everyday messiness of working, living and learning. Learning when conceived as both formal and informal learning occurring in everyday life, will also allude to the importance of society addressing issues of inclusiveness and equity, and for enabling individuals' ability to thrive in uncertain and changing circumstances.

So, more specifically, what does it mean to 'flip the lens', to bring the focus to learner and learning? There are a number of metaphors used in the literature that provide some insights; these are considered under the heading of Metaphors. Following this, is an introduction to the three parts and chapters of this book, that considers how each of the contributing authors speaks to our title and core themes. The latter is expanded on in Chap. 2.

Metaphors Helpful in Unpacking the Learning Experience

Metaphors that provide insights into what it means to flip the lens, include the acquisition and participation metaphors of learning (Sfard, 1998), the banking metaphor of education and critical pedagogy (Freire, 1972), transformative learning (Daniels, 2011; Mezirow, 2009) and expansive learning (Engeström, 2001). Most of these metaphors frame learning as a process that takes place within contexts and ecosystems, within relations of power, dominant discourses and norms, and the emergence and complexity of relations between. They implicitly demand future-orientedness and impact on identities and agency. These conceptualisations provide a basis for appreciating what is involved in flipping the lens to focus on learners and learning.

Freire's (1972) banking metaphor arises from his naming of the depositing of knowledge where the learner is expected to receive, file and store this knowledge, positioning learners as passive recipients. The more this takes place, the less likely learners are to critically question. Rather, they adapt to accept this norm, accepting their role as passive receivers. There are some similarities between the banking metaphor and the acquisition metaphor. The acquisition metaphor positions individual learners as engaging with material in order to make sense of what they are acquiring. This metaphor is likened by Sfard (1998) to accumulating things that the learner owns. Once knowledge has become acquired and is now the property of the individual, it can be transferred to others and to other settings. Sfard (1998) points out that when knowledge is considered as property, it becomes an attribute of position and power and as such separates people into those who have and those

who do not, contributing to growing divides in our societies. Further, within these metaphors is the assumption that it is unproblematic to 'transfer' acquired knowledge to other settings. Yet, as Evans et al. (2011) point out, "putting knowledge to work", requires much learning in translating what is learnt in one setting to another. In other words, it is not a matter of having the need for 'input'. The point is, learners need to engage with the material and apply it in order for sense-making to take place (Bi et al., 2020; Weick et al., 2005). Solving authentic problems that are meaningful (Bound et al., 2016; Herrington et al., 2002) is naturally motivating. The participation metaphor acknowledges this, in part.

The participation metaphor, as the term implies is about taking part in and being a part of a wider whole, bringing attention to the relations between the parts and the whole. This metaphor brings "a message of everlasting hope: Today you act one way; tomorrow you may act differently" (Sfard, 1998, p. 8). Implicitly, context and social mediation are integral to learning in this metaphor. The permanence of "having" in the acquisition metaphor "gives way to the constant flux of doing" (Sfard, 1998, p. 6). Learning is understood as an ongoing process, as compared with learning as having a fixed end point marked by the acquisition of knowledge – that is cast as static. Context brings attention to the language of the community, including its norms that are constantly under negotiation. The participation metaphor provides opportunity for identity building as a learner into a particular kind of professional or role or ways of being. As one participates in a community, so the language, norms and behaviours become a part of the individual, and they in turn contribute to these norms and behaviours – both reinforcing and negotiating change. Such processes are core to identity, and to context. However, beyond these core aspects of context and identity, is a need to question and critique the norms, understandings and behaviours in one's community/ies. In today's rapidly changing world, this is a necessary ability contributing to successfully navigate changing circumstances, and to shaping one's world.

This is where the notion of transformative learning has something to offer. Mezirow's inspiration for transformative learning, was in part taken from the women's liberation movement, that was about the consciousness and liberation from societal conditions and suppression of women (Illeris, 2014). However, Mezirow stressed the cognitive dimension at the expense of the emotional and social dimensions and the situatedness of learning (ibid.). Illeris (2014) suggests a more holistic understanding of transformative learning, moving beyond Mezirow's focus on transformation within the individual and their encountering of difference that disturbs. People's conditions, suggests Illeris, create the need for, and the conditions, for the transforming process, and thus evolving identity/ies. Transformative learning requires strong challenges and needs that individuals and/or groups must meet. These conditions and motivations cannot be imposed. The difference appears subtle, but is fundamental. Mezirow's habits of mind (2000), or personal perspectives focus on individual cognition and are a means for helping individuals move beyond their circumstances. What is missing from this perspective is that the conditions of learning and of learners, mediate the potential and nature of transformation. Mezirow's six habits of mind (1997), for example, do not stand alone inside minds. Minds are insistently tied to the practices and contexts of which we are a part.

As to what a more holistic take on transformative learning might 'look like', Freire's critical pedagogy (1972), would seem to provide some clues. Paolo Freire wrote about the criticality of understanding the learner, their conditions, and what they know, as necessary for 'teachers'. His purpose was to develop a belief and capability in people such that they could transform their situation. A dialogical problem-posing approach means teachers and learners become co-investigators of knowledge and of the world:

> Our relationship with the learners' demands that we respect them and demands equally that we be aware of the concrete conditions of their world, the conditions that shape them. To try to know the reality that our students live is a task that the educational practice imposes on us. Without this we have no access to the way they think, so only with great difficulty can we perceive what and how they know. (Freire, 1998, p. 58)

He flipped mainstream pedagogy on its head by insisting that true knowledge and expertise already exist within people (Saxon & Vitzthum, 2012). His pedagogical approach situates learning and learners at the centre of pedagogical activity, positioning them as change agents of their world. Friere also reminds us that educational activity is never neutral; it can empower or disempower. Such pedagogical approaches bring attention to developing learners' identity, their agency within their contexts, such that they are future-oriented as they seek to change, their world in small or large ways and outcomes.

Transformative learning often involves individuals and their organisations, or communities or activity across organisations and/or communities. Daniels (2011), for example, writes of the transformative learning of agencies involved in the attempt to integrate Children's Services in England, from traditional collections of single service agencies to boundary crossing, across education, health and social services. This involves a range of different professionals working together, developing emergent practices. It was the conditions and the practices within sites that mediated the value and extent of emerging practices, enabling or limiting professional agency, as different agencies sought to move towards more integrated ways of working. These processes involved what Daniels called, transformative learning, for the individual professionals and for the sites of cross boundary activity.

The processes this research team (headed by Professors Harry Daniels, University of Bath, and Anne Edwards, University of Birmingham) used, drew on Engeström's work on expansive learning (2001). Expansive learning is the term Engeström uses to capture changes in practice through the co-design of new tools and processes to meet changing needs. Like the work undertaken by Daniels and Edwards, so too Engeström was working with professionals required to cross occupational boundaries to meet a need for more holistic care. "People and organizations are all the time learning something that is not stable, not even defined or understood ahead of time" (Engeström, 2001, p. 137). Engeström explains expansive learning as a cyclic series of "strategic learning actions" (2001, p. 152) in the process of resolving contradictions in an activity system, or overlapping activity systems. As with transformative learning and dialogic problem solving or inquiry, critical questioning is an important strategic 'learning action'.

Mezirow's disorienting dilemma (Rose, 2015), critical dialogue, critical self-reflection, Engeström s strategic learning actions to resolve activity system contradictions, Friere's dialogical problem-posing method and the participation metaphor's emphasis on engaging and being part of activity, bring a focus to learner and learning, as learners strive to meet emerging needs. Be it being involved in workplace or community settings and solving real issues, or bringing authentic issues to accredited learning, learners are engaged with authentic, real world issues, dilemmas, and/or contradictions.

The purpose here is not to provide an historical account of these ideas, but to note that like any field, our understanding of learning is constantly evolving, as are our practices to support learning. Theories of learning – behaviourism, cognitivism, constructivism – have long driven various approaches to learning, but there has been a disconnect between these theories and the realities and messiness of learning; concerns such as, separation of mind-body, of theory and practice, of context from behaviour. Socio cultural psychology developed out of "concerns about the separation of mind and the world, or self and context" (Edwards, 2010, p. 65) instead situate learners in cultural contexts and their material artefacts which mediate actions, activity, being, and becoming (identity) and thus learning. Socio-cultural perspectives recognise that "mind and world are recursively interconnected in relationships that change over time" (ibid, p. 139). We are always learning that which is not yet stable or understood (Engeström, 2001), that which is emergent, as we co-construct that which is emerging. Being future-oriented is implicit in such constructions of learning.

The Chapters

The first part, written by the editors, outlines the key ideas in this book. Part II provides various frameworks for re-thinking learning. Such re-thinking necessarily involves the use of differing conceptions, and theoretical frameworks. The third part shares specific approaches for enabling flipping the lens to bring a focus in different contexts, to learners and learning. For example, Lim's Chapter on work-based learning, also commonly known as work integrated learning, highlights identity development as a professional. Authors Bound and Tan focus on educational contexts, but indicate that dialogical inquiry can be applied in any context; and Bi examines learner's sense-making in and across multiple contexts of blended learning (classroom, online and work settings). These different contexts, create differing possibilities for enabling identity work and developing future-orientation.

Part I: Conceptualising Flipping the Lens

This first Chapter has offered a number of different metaphors that enable educators and others concerned with learning, to move beyond the traditional big theories of learning – behaviourism, cognition and constructivism. Chapter 2 builds on this first Chapter to unpack the three major constructs of identity, context and future-oriented that are central to this book. The editors' lay out their argument for empowering learners beyond a series of learning incidences or course(s), to learning that is future-oriented, and being and becoming a continuous journey of identity development where context is understood as integral to and implicit in learning. These constructs are conceptualised as linked, entwined and embedded each in the other, and positioned as key components of shifting to a focus on the learner and learning. Bringing a focus to learners and learning requires consideration of learner's biographies (Olesen, Chap. 5), their evolving identities, the contexts in which learning happens and why. Being and becoming future-oriented is a condition for thriving in a world of dynamic, rapid change.

Part II: Framing the Issues

The four chapters in this part powerfully contribute to new conceptualisations of learning, identifying the limitations of the metaphor of learning as acquisition, to reconceptualise learning as relational, embedded in contexts that mediate identity formation and reflective of today's complex world. Such new thinking about learning is necessary to enable flourishing of individuals, communities and societies.

Anne Edwards (Chap. 3) writes powerfully about what it means to 'flip the lens' for learners, for educators, for workplaces and for society, prompting the reader to consider the inter-relations between conditions, practices and persons in everyday practices. Using a Vygotskian conceptualisation of learning, she defines, "learning as an agentic process of recognising and tackling problems and using resources in practices in increasingly informed ways in order to reposition oneself more competently within a practice". Her gaze is firmly on the interrelationship between person and the practices of their context(s). As with her previous work, Edwards makes an important contribution to socio-cultural writings and the literature on workplace learning in her unpacking of cognitive processes and their mediation. Connecting what learners know implicitly in practice with conceptual frames that they build and develop, as they move iteratively between practice, synthesising (for themselves) concepts they implicitly know, and opportunities for reflection. Such processes provide the basis for using concepts to make inferences for arguments moving forward. This, Edwards suggests is important in developing future-oriented learners.

At this point, Edwards introduces Hedegaard's notion of 'motive orientation'. "Motive orientation" replaces the question, 'how to motivate learners?' This question places responsibility with the educator or supervisor, whereas, 'motive orientation' refers to learners' negotiation between their experiences of activity and actions within the practices they are immersed in. In sites of 'intersecting practices' Edwards unpacks three main capabilities of future-oriented learners: relational expertise, common knowledge and relational agency. She concludes her chapter with considerations of her cultural –historical approach for formal education, workplace and work-based learning and for society.

Säljö (Chap. 4) also repositions learning, not as behaviour and cognition taking place in individual minds, but, as emergent through activity in collaboration with the symbolic technologies in use in the context of the activity. Symbolic technologies are explained as, tools that intercede in intellectual activity. Everyday tools, such as writing, and use of tabulations, have embedded within them and thus provide access to, historical forms of mental activity. As such they become "cognitive amplifiers" which in turn become part of flexibility in cognitive activity such as analysis, prediction and reflection. As symbolic technologies provide us with access to a wealth of information and possibilities, it is not necessary, points out Säljö, to reduce learning to acquiring and remembering information. Säljö unpacks this claim through examples of shared experiences and actionable understanding from the medical field. He points out that symbolic technologies present their own hurdles; they are not necessarily self-instructive and thus require some scaffolding to learn their use and affordances. Learners need to be positioned as active users, and problem solvers.

Roger Säljö presents a strong argument for a rethinking of learning. The limitations, he claims, of theories and perspectives of learning that have informed research over the last 150 years are their inadequacy in explaining learning in today's complex environments. Skilled performance in contexts where symbolic technologies are in use, is about different ways of knowing always in relation to the specific circumstances and needs. Like other authors in this volume, this call for more complex, nuanced conceptualisations of learning have at their heart, a depth of understanding of today's changing world, and of human interaction. Säljö highlights that in complex contexts, knowing and learning are dependent on symbolic technologies that mediate actions, activity and learning.

Salling Olesen (Chap. 5) turns his attention to the subjectivities of working people and their learning experience. This brings him to a consideration of a complex agenda crossing the embeddedness of individual and the societal level of analysis. Development of professional identities, government policies and enactment of lifelong learning through provision of education and training, and competence frameworks, are brought together in subjective experiences; that is, what the *experience* of learning is for both individuals and for the collective.

Current policy and educational institutional focus on outcomes as they relate to employability, states Salling Olesen, both limit, but also raise new possibilities for working people's participation and democratic struggle over processes of learning. This is not and cannot be a struggle about learning over acquisition of knowledge,

but of learning as a constructive interactive activity; individual as an island replaced with social/collective/network subjectivity; and learning as beyond mental phenomenon to learning in relation to materiality, bodily knowing and learning as social processes. This redefining and refocusing of understandings of learning is rooted in Salling Olesen's conceptualisation of the social, political and economic agendas in relation to lifelong learning and the changing nature of work. He brings to the fore the contradiction in reliance on competency discourses that hold a tension between universality/abstraction and specificity/concreteness that cannot be resolved satisfactorily. This is because competent actions are subjective processes, in context. In this chapter, he also offers methodological frameworks for researching learners' subjective experience of learning through studying individual life history and the dynamics between life history and society, structures and change.

The final Chapter in this part, focuses on transitions in work and learning and offers a social economy perceptive on the future of work and a conceptualisation of future-oriented learning. Chia reminds us that futures are not so knowable, they are uncertain. He rejects human capital notions of learning and knowledge which position learning as separate from context; 'from the material basis of work and life'. Instead, he offers the readers an alternative future, imagined as more equitable, one where learning is based on needs and interests of working people. Critical questioning of the silences in much of the literature on the imagined futures of work, around inequalities, inclusion and exclusion, and who is doing the imagining, invite the reader to question utilitarian interpretations of transitions in futures of Bauman's 'liquid life'. Chia constructs the meaning of transition as having three strands: changing conditions of work; processes and strategies of self-making; and rising individualisation, as they relate to differing narratives of the future of work. By positioning learning in the context of constant transitions in liquid times, learning is conceived not as the utilitarian acquiring of knowledge and skills at the right time to get the job done (a human capital perspective), but that which is empowering, contributes to critical engagement and co-creation in conditions which are democratic, enabling the bringing of something new into the world. With this framing of learning in and for futures of work, he moves onto operationalising future-oriented learning by introducing the six principles of learning design (Bound & Chia, 2020). These principles, assume empowerment of learners to exercise control and mastery over their work, lives and futures; advance the autonomy and individual agency of learners; and future oriented learning as a set of practices enabling interpretation, reflection and creation of dialogues with others and with their social environment. The six principles of learning design, enact these three propositions engendering learning through mutual exchange, agency and a language of participation and engagement. He concludes with reference to Freire on empowering learners for transforming the world, connecting imagined futures and future-oriented learning, as enacted through the six principles of learning design.

Part II Flipping the Lens in Practice

Owen's concluding observations that facilitators and designers of learning for learners in work contexts should consider the cultural and structural conditions that would enable learning, is a core premise of her Chapter (Chap. 7). She brings together, the three core constructs of the book in her consideration of how enabling conditions afford opportunities for individual and collective learning, providing spaces for the exercising of individual agency. Like Edwards, and Säljö, she draws on the cognitive literature, using Kolb's four elements – experiencing, reflecting, conceptualising and experimenting – as a framework to facilitate learning in the workplace. Also, like Edwards, Owen highlights the affordances of context, but differently to Edwards' focus on mediation, which implicitly applies Säljö's conceptualisation of 'symbolic technologies. Owen brings a focus to the culture (s) and structure(s) of the workplace. Using her experience with 'High-3' workplaces (high intensity, high market and community expectations of reliability, and high levels of reliance on technologies) she links Kolb's processes of learning with elements of workplace contexts, unpacking these through a series of examples. This Chapter is rich in practical applications that are strongly embedded in theory.

Lim brings attention directly to agency, identity, and how learners' identity development can be operationalized to account for learning towards expertise. She argues that "identity allows us to unpack how people become who they are, and in the same vein, the expertise they acquire and the kind of expert they become". She dances across Sfard's (1998) acquisition and participation metaphors of learning, in linking identity, learning and expertise. Lim argues that identity is a dialectical process between self, roles, positions, and social interactions. She highlights that identity development involves time-space interactions in relation to particular roles and the recognition of others of the enactment of identity in moments in time. The process is repeated across time, contributing to the ongoing evolution of identities and others' perceptions through a constant process of negotiation within particular contexts. The process of negotiation and renegotiation is mediated through cultural norms, and their discourses (big D and small d).

Lim (Chap. 8) links identity development to developing expertise. Interestingly she links this highly social and negotiated process, more akin to the participation metaphor of learning, to Dreyfus and Dreyfus' linear model of stages of 'skill acquisition'.

She provides some fascinating examples of kinds of identity into which people can be positioned as a precursor to suggesting that the range of identity positions made available to learners in work study programmes can be designed for. Design considerations include issues of power – who in the workplace hierarchy will the learner be in contact with, how will formal and informal influences be experienced? In considering progress, three perspectives are useful in journeys towards expertise: the learner's view, and how the learner is being influenced by others in the process of being and becoming, and also the learner's reflection of their own development in relation with their own desires and aspirations. To facilitate this process, Lim suggests debrief or stocktaking sessions between all involved – educators from the

institution, and expert practitioners from the workplace. When learners are part of these reflection opportunities, the value and importance of reflection, such as captured by Edwards in Chap. 3, is enhanced.

Bound and Tan (Chap. 9) make very direct links between the use of dialogical inquiry and learners' development of agency and future-oriented capabilities. Much of the literature on dialogical approaches has focussed on teachers using this approach with children in schools. This Chapter recounts its successful use with adult learners, but also tells of some of the challenges in using this approach. These authors see inquiry as a natural component of dialogue; hence the term 'dialogical inquiry', as the expression and building of meaning is always future-oriented. Dialogical inquiry approaches, as unfolded in this Chapter, requires a different stance and a different division of labour for both educators and learners than in monologic approaches. Dialogical inquiry also requires beliefs about learning, not as acquiring knowledge as a product, but as Edwards and Owen (this volume) indicate, as enabling a repositioning of self in practice and changing of relations in given contexts. Bound and Tan provide some very specific 'tools' they use to enable learner agency, meta-cognitive capabilities and deep understanding – all important aspects of future-orientedness.

In her chapter, Bi (Chap. 10) builds on the organisational literature on sense-making to share two of the case studies of a research project conducted in Singapore. She presents the reader with the features of sense-making as experienced by learners in the two blended learning courses discussed. One course provides an illustration of the use of all features of sense-making and the other course, has limited use of the features of sense-making. It becomes abundantly clear that particular attention to design and provision of experiences for learners, that afford opportunities for use of all features of sense-making is required. The feature that seems most problematic for learners to experience in typical courses, is action; this feature is particularly important for enabling future-oriented learners who are agentic. The study further confirms what has long been assumed in the work-place learning literature, that 'good' work (work that is well designed, includes challenge and autonomy for example) provides excellent opportunities for use of all the features of sense-making.

The intention of this book is to offer different ways of thinking about learning beyond the traditional big theories. These theories have done their time, and need to be reconsidered, recast, perhaps some aspects discarded and reconfigured in conjunction with different perspectives that give credence to the realities of adult lives, the complexity and messiness of learning, the embeddedness of learning and context and evolving identities, and the urgent necessity to empower our learners to thrive in their dynamic and changing worlds.

The bottom line is learners' experience of learning. The editors hope is that this book excites the reimagining of learning, the design and enactment of learning and most of all, contributes in some way to the joy of learning for all.

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Helen Bound (PhD), Institute for Adult Learning, Singapore University of Social Sciences, Singapore

Associate Professor Helen Bound is Deputy Director, Research and Innovation Division, Institute for Adult Learning. Helen's research interests focus on learning across a wide variety of contexts, including workplace learning, learning in high technology environments, professional learning and learning through collaborative activity. She is also interested in the contexts of learning and has published widely on a range of topics, including, learning spaces between classroom and work, specific pedagogical approaches and tools to support learning, competency development, professional development of continuing education/vocational teachers, workplace learning, and learning and development of non-permanent workers. Helen has a background in vocational training and education (University of Tasmania, Australia) and before that spent some years as a trade union trainer and running her own training and development business. Prior to that, her experience teaching in Australian secondary schools is the source of her deep interest in pedagogy and learning. Helen is a member of the Committee for Researching Work and Learning International Conference Series; has co-edited special editions of *Journal of Work and Learning*, is a member of the editorial and review boards for *Australian Journal of Adult Learning*; *Futuristic Implementation of Research in Education, and International Journal of Vocational Education and Training Research.* Her other books include *Towards a new understanding of workplace learning: The context of Singapore* and *How non-permanent workers learn and develop. Challenges and opportunities.*

Chapter 2
Key Constructs: Conceptions of Learners' Future-Orientation, Identities, Contexts and Practices

Helen Bound, Jennifer Pei-Ling Tan, and Rebekah Lim Wei Ying

Abstract There are three major constructs that are pivotal to the chapters in this book. They are: future-orientation identity, context and practices. These are not stand alone constructs but are inextricably linked and related. The intent of this chapter is to unpack and foreground these constructs and show how we, the Chapter authors, believe them to be related and embedded each in the other, and most importantly, how they are key components of shifting to a focus on the learner and learning.

We argue that to empower learners beyond a series of learning incidences or course(s), learning needs to be future-oriented, such that being and becoming are a continuous journey of identity development within and across contexts and their practices. Although we emphasise the relatedness and embeddedness of these constructs each in the other, we treat them separately for explanatory purposes, but keep true to their relational integrity within the explanation of each construct. We begin the Chapter with two stories which are used to illustrate each of future-orientedness, identity, context and practices and the relations between them. The stories are followed with an unpacking of each of our core constructs. The Chapter concludes with a discussion of what these constructs imply for our understanding of learning.

Keywords Future-orientation · Identity · Context · Learners · Practices · Learning

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H. Bound (✉)
Institute for Adult Learning, Singapore University of Social Science, Singapore, Singapore
e-mail: helen_bound@ial.edu.sg

J. P.-L. Tan · R. Lim Wei Ying
Singapore University of Social Science, Singapore, Singapore
e-mail: JenTan@ocbc.com; rebekahlimwy@suss.edu.sg

H. Bound et al. (eds.), *Pedagogies for Future-Oriented Adult Learners*, Lifelong Learning Book Series 27, https://doi.org/10.1007/978-3-030-92867-4_2

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Two Stories

David's Story

The story that follows is of a Human Resource Manager undertaking a Masters programme, part-time. The course discussed here is on Workplace Learning and Performance. Students were required to select a workplace learning issue at their workplace, gather data and analyse this to understand the nature of the issues or problem, and design learning solution(s) and an evaluation plan to address the issues. These were required elements of the assessment activities. David's (pseudonym) workplace learning 'problem' and aspects of his learning journey are detailed here.

In a workplace involving heavy machinery in Singapore, there are workers from many nationalities and cultures, where Singaporeans work closely with other migrant workers from neighboring countries—India, mainland China and Malaysia. The local on-site supervisors are often frustrated with foreign team members not wearing steel capped boots, helmets and other personal protective equipment and with those who operate the forklifts zapping across the work spaces at high speeds. To address this problem, David (a psuedonymn), a member of the human resource (HR) team used a common HR discourse that focuses on performance gaps to address what appeared to be a lack of occupational health and safety (OHS) capabilities. However, on understanding more about the processes and perspectives involved in supporting and designing for workplace learning, David came to perceive that the HR discourse of a deficit approach, needed to be challenged. He commented in an assignment (data from an Institute for Adult Learning and CRADLE, Nanyang Technological University project on Dialogical Teaching by Bound and Tan) that,

> "I was … influenced by preconceived stereotypical ideas of the foreign operators' work practice. These had blindsided me from their strengths and competences, which were equally important, as these are personal factors that would also influence and shape their learning

interventions. I realized that the stereotypical perception that they were novices had to be challenged, as their behaviors were not due to their lack of skills, but due to the culture and the work environment they had back home. This subsequently led me to reframe my perspective and improve [the learning intervention to establish a culture of safe practices] by looking at strategies that capitalize on the strengths of the learners and supervisors who are their mentors." (David). (Permission to use this material was sought and gained from 'David'. See Bound et al., 2019 for project details)

The Story of Cassie and Alice

This story illustrates teachers' use of technology tools and the implications for their teaching and the experience of their 10-year-old learners. The story centers on modifications to the design of an applet in a lesson study context. This computer applet was used in tandem with a worksheet for the conversion of mixed number to improper fraction. It was found to be inadequate in supporting learners to visualize the math in the conversion task. Specifically, the learners were supposed to engage in visualization via the applet to convert the mixed number 2 ¼ to an improper fraction (answer ⁹⁄₄). They did it by rote method, and derived the answer without using the applet. The teacher Cassie [pseudonym] was the one who developed the computer applet, and embodied a situational identity in the school as the technology kind. Alice [pseudonym], was the head-of-department, in charge of the math curricula in the school.

The teachers explored how the applet could be modified such that it will engage learners in visualizing fractions in problem solving. As Cassie was deliberating the programming issues she would face, Alice proposed that a simple interchange in the representation would do (see Fig. 2.1), and no challenging programming was required. Essentially, when learners entered numeric numbers into the green boxes, and observed the pie charts change dynamically, it would allow them to visualize how improper fractions were derived (from the number of quarters shown in the pie charts).

"We want to see the change... so the child will be able to see that. Then it will be how many quarters plus how many quarters. I should be able to count" (Teacher Alice).

These two stories are variously interwoven into the following sections.

Future Orientation

What do we mean by future-oriented learning and what does it mean to be a future-oriented learner? In what ways should (and can) we—as a global professional community of lifelong learning educators and researchers—engage with and cultivate future orientation in learners? And perhaps most important of all, why does future orientation matter to the lifelong learning enterprise globally, yet indigenously situated within individual learners' contexts and identities? Definitive answers to

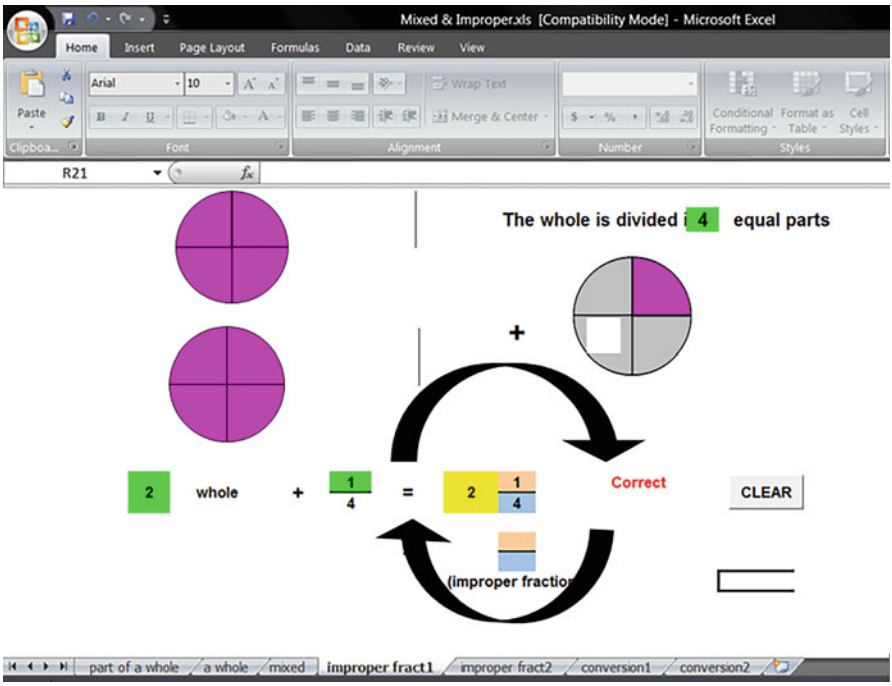

Fig. 2.1 The interchange suggested by Alice (Lim, 2013)

these imperative questions are far from clear. While modern conceptualisations of future orientation can be traced back to the early-mid 1900s (Seginer, 2009), current theoretical and empirical understandings of future orientation remain nascent, particularly in the field of lifelong learning sciences. To this end, generating new and meaningful insights into these important questions serve as a central aspiration of this collective book venture.

We attempt a brief outline of some notable contemporary definitions and approaches to understanding future orientation, and its implications for learners and learning. First, what is future orientation? Understandably, multiple definitions exist. Future orientation—sometimes referred to as "future thinking", "future time perspective", even "foresight"—is most commonly understood as "the ability to foresee, anticipate and plan for future desired outcomes" (Kooij et al., 2018). Put another way, it generally refers to the extent that individuals think about their future, anticipate future consequences, and set goals towards their aspired states (Steinberg et al., 2009).

One definition purported by Seginer (2009, p. 1) emerged as particularly distinctive because it foregrounds the latent negative affect or emotions associated with the unfamiliar or unknown, apart from more singular positive projections of the future:

> ". . . future orientation is about where one wants to get and the ways she or he ought to go, it is also about destinations one fears to reach and routes she or he should avoid." (p. 1)

From these generally accepted definitions, it becomes apparent that the concept of future orientation has its roots steeped in psychology. Leading up to the present, theoretical underpinnings of future orientation is still largely informed by six psychological fields: motivation, personality, self-theories, cognition, neuropsychology and human development (Seginer, 2009). From these theoretical stances emerged four popular interfacing conceptual approaches: the motivational approach; the possible selves approach; the personality goal approach; and the personal dispositions approach.

The motivational approach is largely credited to the pioneering work of Nuttin and Lens (1985) and propagated thereafter by the Leuven group (Kooij et al., 2018). It is premised on two basic assumptions: that humans are able and begin to engage with aspirations, goals and plans since young, and towards a future state in time. This approach, therefore, is particularly concerned with the ways in which future goals influence current behaviors, and the motivational mechanisms—both intrinsic and extrinsic—that drives humans to make present-day choices and behaviors with the aim of achieving their future desired goals (Seginer, 2009). In similar vein, the *possible selves approach* is rooted in self-theory research premised on three assumptions on the nature of self: that the self is (i) multifaceted; (ii) represented across the past, present and future; and (iii) responsive to motivational capacities that leads to goal directed behavior (Markus et al., 1990). Possible selves pertain to how people view their own potential and their future—their hopes, goals and fears combined. The *personality goal approach* shifts the thinking away from future orientation as a fixed trait, towards a recognition that it is contextual, malleable, and influenced by one's experiences of both successes and failures (Karoly, 1993). As such, this approach focuses on studying individuals' goals and how these influences their decisions and behaviors.

Last but not least, the *personal dispositions approach* tends to foreground the capabilities and competencies associated with future thinking, evaluation and action, including meta-cognitive skills such as goal-setting, planning, monitoring and regulating (Anderson & Wood, 2005; Snyder et al., 1991; Boyd & Zimbardo, 2005). This is arguably most widely manifested in the current educational landscape through various representations of twenty-first century curriculum frameworks—both national and global (e.g., Ministry of Education Singapore, 2010; Tan et al., 2017), as well as various adult learning/skills frameworks that point to "future skills", "future readiness" (e.g., Voß & Pawlowski, 2019), and "future smart" (e.g., OCBC, 2018), among others.

Reflecting on the four interfacing approaches outlined above, we observe that although traditionally borne out of psychological studies, focused on the individual, isolated from their context and practices, there is increasing recognition that *future orientation* powerfully shapes, and is shaped by identity formations and transitions, and deeply embedded within social-cultural and historical contexts (Ronkainen & Ryba, 2018; Seginer, 2009). Building on this more ecological perspective, but still informed by the psychological perspective future orientation, and by implication, being future-oriented could be considered as *the dispositions, process and accomplishment of thinking about, preparing for, and traversing the future*.

However, this conceptualisation of future-orientation only nominally accounts for socio-cultural and historical contexts; the emphasis remains on the individual and their usual responses and behaviours, separate from the dynamic, changing circumstances and conditions of the individual, over their lifetime. Why learners should develop such dispositions is not accounted for. As the authors in Part II of this book inform us, future-orientation is contingent on intent and context (Edwards; Säljö, Part II, this volume). Edwards (this volume) points out that the need to meet different demands of different circumstances, practices, roles and purposes is the motive for a future-orientation. As identified in Chap. 1, she uses Hedegaard's, (2012) term, 'motive orientation' that refers to cognitive and emotional responses as people orient themselves to meet emerging needs throughout their lifespan. Chia (Part II, this volume) likewise situates future-oriented learning in a context where futures are less knowable and uncertain.

Future-orientation, then is implicit in human responses to lived circumstances and has become a focus as change is increasingly a part of societies' and people's lives. However, orientations—beliefs and actions—that are geared to 'future' is of course highly varied and constantly emergent. While the personal dispositions approach, often resulting in lists of skills, may be helpful in guiding what to teach, it does not account for the circumstances of people's lives, that is, the source of motives to *be* future-oriented.

Cassie and Alice's story is illustrative of the implications for learners and learning. Students using rote learning strategies does not equip them to solve unusual, complex or emerging problems. In using technology as a teaching tool, the challenge and learning for the teachers, was to help learners develop a deep understanding of what is happening when you add fractions together. This deeper understanding contributes to positioning learners to work with more complex challenging problems in the future. In this instance it is about developing capabilities that are future-oriented. Alice's suggestion was critical in her own and Cassie's learning as she moved to positioning the learners as the focus, not the technology. The use of symbolic technologies (Säljö, Part II, this volume) such as this, illustrates their potential for extending minds (see Säljö); something that is implicit in the very nature of future-orientedness, where "new epistemic practices emerge" (ibid).

David's story is similarly illustrative of opportunities for learners to develop deep understanding, and learning to learn, albeit that the symbolic technologies used were more basic. Through dialogue, exposure to different theoretical perspectives, critical questioning and feedback from peers and educator, David was able to develop new epistemic practices, shifting from human capital formulations to a holistic valuing of people in their contexts and valuing their biographies and life experiences.

The course David was taking was designed using the Six Principles of Learning Design (6PoLD) (see Chia, Part II, this volume) (Bound & Chia, 2020). The 6PoLD is posited as a possible framework for a praxis of future-oriented learning. As Chia notes, when considering future-orientedness, we must also consider what we want the future to be. The 6PoLD, he suggests, is a framework that enables learning environments that are democratic and foster flourishing in the 'liquid life'.

All four authors in Part II argue that *being* future-oriented, is indelibly bound up with identity and agency.

Identity

Identities determine what matters to us, with whom we share information, and who we trust for what purposes. Identity is knowledge of "what one is doing, and why one is doing" (Giddens, 1991, p. 31 in Trede & McEwen, 2012, p. 30) and also, what one stands for. Professional identity is developed through experiences and the individual expressing what matters to them as they engage in activities. We develop many identities which are enacted in different settings with different purposes. Trede and McEwen (2012) suggest that identity can be understood as three different selves—a coherent core self, a socially constructed self and a fragmented, constantly reforming through dialogue self. The coherent core is important in being true to oneself, in order to negotiate the self in changing settings, purposes and conditions (Bound et al., 2019).

This constant negotiation between the self and the social conditions (Eteläpelto, 2015) means the inner world of the individual is always dynamically and dialectically engaged with:

> external representations mediated in and through semiotic systems [cultural tools]. In this view, identity is regarded as a dialectical process between self and social roles and positions, developed and maintained through relevant social interactions (Antaki & Widdicombe, 1998; Bakhtin, 1981). This view privileges the micro interactional moments as sites of identity construction, and reconciles the many and sometimes contradictory identity positions circulating at different timescales (Benwell & Stokoe, 2006; Lemke, 2008). (Lim, 2017, p. 1)

Identities are always work in progress as we participate and engage in different activities and communities. As such we are always being and becoming our core selves, a particular profession or vocation, or role (e.g. a parent, a manager, and so on). Identities "are important bases from which people create new activities, new worlds, and new ways of being" (Holland et al., 1998, p. 5).

Ways of talking about identity and growing identity, such as being and becoming are important for educators. The authors of this Chapter argue that developing identity as a learner and as a particular vocation, profession, change agent, or whatever, means it is essential for educators to deliberately plan for and facilitate identity work. This is not to say that there is a singular professional or vocational identity; indeed, as Eteläpelto (2015) notes, subjects' professional identity within the same profession can be quite different. For example, Vähäsantanen et al. (2008) found four types of teacher identity amongst Finnish teachers, based on their different orientations; educational, network, subject-matter and research and development orientations.

Identity mediates agency. Agency can be understood as subjects exerting influence, making choices and taking stances (Eteläpelto et al., 2013). Agency can be

individual and collective; it can be exercised to support or negate change, yet, human agency is necessary for change. Agency involves making judgments and decisions that make visible what one stands for; it is a process of "disintegration and emergence, of getting lost and finding something anew" (Trede & McEwen, 2012, p. 32). It is a process of learning to connect all aspects of professional practice in a responsible and reasoned manner, enabling the development of a sense of ownership of identity and thus to negotiate one's position within a profession, vocation, organisation or other context.

However, none of this takes place in isolation. Albeit that individuals elect whether to, when, and how they engage in opportunities afforded them (Billett, 2015), this exercising of agency is mediated by the conditions or context in which individuals and collectives interact in or engage with (see Edwards; Säljö, Part II, this volume). It is not just the immediate setting, but the global structure and dynamics of the systems, that constitute what we become (St. Julien, 1997; Henning Olesen, Part II, this volume). "Any identity is basically relational to its conditions of existence, any change in the latter is bound to affect the former" (Du Gay, 1996, p. 184).

Curriculum and learning frameworks enhance or limit opportunities for agency. Chia (this volume, Part II), for example, notes that competency-based learning and its appropriation of cognitive and behavourist understandings of learning usually offer but one way, one frame of understanding, one process, rather than multiple possibilities and perspectives. Edwards (Part II, this volume) neatly captures identity and agency in her statement that people are "not the agents of capital or Empire, but responsible beings, changing the conditions of their lives as their agency unfolds and their identities evolve". Agency is necessary to change the conditions of our lives.

David's story illustrates the potential of people to transform the lives and identities of others and self. He exercised considerable agency in changing the typical HR response and practices from a deficit approach based on traditional understandings of competencies to a more holistic approach, delving deep to understand the problem, and addressing contextual and individual needs. David's solution involved the sharing of stories, putting individuals in the shoes of others to develop cultural understandings and deep understanding of safe work practices. Supervisors and the operators across the different nationalities renegotiated their identities and work practices, as a result.

In using a dialogical inquiry approach, learners in David's class (n = 30 practitioners—teachers, maritime HR personnel, nursing, team leads for administrative work, etc.) undertook extensive identity work—it was implicit in the pedagogical approach of the lecturer. This was *the first time,* these learners experienced a dialogical approach. The essence of a dialogical approach involves using authentic issues, problems and assessments, student choice on what they work on, exposure to multiple perspectives, the learner's voices are not only valued, but required as they build their own understandings, question beliefs, critique and in the process co-construct knowledge and learn to learn (Bound et al., 2019).

In comparing this unit with other units in the Master's program students expressed initial confusion and concern.

> Not so much of a top-down approach. It's like the facilitators (of the course], they basically, they don't just come in and they start pouring information into our heads. Maybe for some of us they are not so used to this kind of approach they may find it threatening.... (Holly)

Holly's experience of having information poured into her head positions learners as passive receivers of knowledge, and the educator as expert. This contrasts with Bernard's reported experience in the dialogical inquiry classroom in the Workpalce Learning and performance course.

> It definitely challenges us to think more about the issues that were presented to us and as compared to, you are doing it alone, it's like the acquisition metaphor. You do it alone, you try to think about it, you try to read books. But through participatory, in a group, the exchanges, the kind of views that we share and whether we agree or disagree, it actually helps us to really...how should I say? *Think about the questions, look at it from a different perspective* and try to also *understand from your peers their other angle* on the way they see the issues. And that actually expands our so-called *understanding of that particular issue* that we are talking about. Because without that, you will only have your own perceptions and your own understanding. With others' inputs, that *helps expand your ability to understand* the subject better. (Bernard)

The intersection of identity between the individual and the social (Eteläpelto, 2015) is clearly evident here. The conditions established through using a dialogical inquiry approach provided affordances for changing identities, both as a learner (from passive to active) and as practitioners in their own fields. Specifically, multiple occurrences of dialogue that required the linking of theory and practice (their own practices) afforded learners opportunity to progress their discourse so that they proposed, explored and evaluated alternative ideas, explanations and solutions and, together, to construct the most satisfactory outcome of which they are capable (Wells, 2002).

Notably, the lecturer also exercised agency, by going against the 'social suggestion', the big D discourses within the Masters program, in using a dialogical approach. Her core identity valued empowerment, and developing people as change agents, a strong belief that learners actively make sense and have much to contribute. She saw the dialogical approach as a pedagogical means (cultural tool) to enact her values.

In the story of Cassie and Alice, the teachers were learning to be the technology kind; an identity where new practices could be enacted in the classrooms for deeper inquiry-based learning, that implicitly contributes to future-orientations and evolving learner identities. For these teachers there were overlapping aspects of selves. Cassie had been socially regarded as the experienced one in technology infusion and had positioned herself as the programmer of the applet by evaluating suggestions from a programming point of view. Cassie's positioning, had in dialectical ways, positioned other teachers as providers of solutions. Such was the case with Alice as she drew on enactment on the applet to assert her suggestion. The new ways of teaching moved learners away from the rote method of problem solving to one that focused on mathematical reasoning—a more future-oriented approach.

We have seen how future-orientedness and identity are entwined, each with the other. As Salling Olesen consistently argues (Part II, this volume), identity and

agency must be studied in relation to context, to individual's circumstances and conditions and the practices they are engaged in.

Context and Practices

Context is often understood as being 'out there' as external and that which can be conveniently fenced off. Such understandings set up binaries that are not helpful. For example, internal to the organisation, external to the organisation, internal to individual decision making and judgement and external to these processes and actions. Another way context is often understood is in layers—macro, meso and micro. Typical examples include, national policy, industry markets, then organisations, then teams or individual competence. Such understandings often pay limited attention to the relations between these layers (Bound & Rushbrook, 2015). So what do we mean by context?

Context can be understood as the interconnectedness of policies (national and organizational), discourses, norms (e.g. professional, national, organizational, within a team, a classroom), the physical architecture, the stage of development of an industry that shape relations and interactions between people and things. The theoretical practices lens (Schatzki, 2012; Kemmis, 2019) provides a more fine-tuned lens to understand relations between doings, saying and relatings (Schatzki, 2012) between humans and non-humans in what is generally a situated context. However, situated contexts are themselves mediated by context as described here. Nicolini (2013) brings these together when he writes about the need to 'zoom' out to this bigger picture context and 'zoom in' to the situated practices.

But what does context and practices, have to do with learning? The authors draw on the Vygotskian tradition to understand that learning is mediated by the cultural tools that constitute the context and practices in which individuals and collectives engage. Vygotsky argues that the mediation of (human) action is through signs and tools (i.e. cultural tools) enabling individuals and collectives to regulate their interactions with the world (Vygotsky in Engeström, 1999, p. 29). These cultural tools (physical and mental) have embedded within them historical practices and understandings, discourses and ways of viewing and interpreting the world, policies, expected behaviours and standards of performance, power dynamics and so on. Cultural tools are part of everyday practices, mediating affordances for learning, and at the same time result in tensions and contradictions.

This dialectical relationship between people and the practices they inhabit, is central to Vygotsky's work (Edwards, Part II, this volume). That is, not only are our learning, identities, and future-oriented dispositions mediated by the practices and contexts we are part of, but we too *act on* these practices and help shape them (ibid). That shaping (and learning that is part of the process) may involve reinforcing existing practices, making adjustments (e.g. bending the rules), changing practices (e.g. thinking and acting outside the norms of the practices), albeit that some practices can be hard to change. Symbolic technologies (Säljö, Part II, this volume),

are particular kinds of cultural tools, that constitute important aspects of the dialectical relationships between people and the practices they are a part of. Säljö provides multiple examples of symbolic technologies extending human minds. However, like any cultural tool, symbolic technologies are embedded with cultural and historical practices that also have the power to limit thinking and ways of being (identity). Hence the importance of future-oriented dispositions that seek to challenge what is. Cultural tools, of which language is a primary tool, are also evident in race, gender, social class, sexuality and so on. Experiences, says Salling Olesen, both individual and collective, can change social practices. Be it explicit or implicit, all authors in Part II and most in Part III work with the understanding that context and practices, and learning, mediate each other. In rejecting instrumental understandings and enactments of learning, Chia (Part II), for example, writes of the importance of future-orientedness and working towards a future that is democratic, where people flourish. Such learning enables people to act on their worlds, their contexts and the practices they are a part of.

David's story is illustrative of how various cultural tools afford particular approaches to learning, and power dynamics. David's initial naming and framing of his workplace learning issue was a reproduction of the cultural tools of human capital perspectives, that are often embedded in the training of human resource personnel. On being exposed to different cultural tools—language and discourses (ways of thinking and framing an issue)—and with the help of feedback from his peers, David reframed his workplace learning issue. Core to the reframing was that the foreign workers did not so much lack skill in driving forklift trucks, but that their home practices and institutional requirements were different. The lack of trust in the competence of the foreign operators by the local supervisors and Singaporean operators was likely due to misunderstandings. Rather than providing courses for the foreign workers in Occupational Health and Safety and developing competence in driving forklifts, he worked with foreign workers and Singaporeans in the workplace, to create an understanding of each other's cultural practices and institutional requirements in Singapore.

Working with learners' contexts and practices enables learners to reposition themselves in their practices (Edwards, Part II, this volume).

Implications for Flipping the Lens to Focus on Learners and Learning

The implications of future-orientedness, identity and agency, and context and practices for conceptualising learning, offer very different understandings from the big learning theories of behaviourism, cognition and constructivism. This is not to outright reject these theories. As Säljö and Edwards emphasise, our emerging new understandings of learning are embedded in cultural-historical, traditional understandings. We can see this for example, in Säljö's explanation of the ways in which

symbolic technologies extend cognition, extend the mind. The role of neuroscience in enlarging our understanding of how the brain works is important in how we as researchers and educators make sense of how to design learning. To evolve learning theory we need new methodologies such as for neuroscience and cognition to be studied 'in the wild', in context and every day practices. What this Chapter offers for an emerging understanding of learning—and we say emerging as this is but one of many examples of newer theorizing about learning—is learning does not have to be about reproduction of humans as economic units. Learning should be about hope, about building capabilities such that people develop their sense of agency to change their world and the worlds of others, for the better.

To do this, it is necessary, not just to take note of learners' circumstances, contexts and practices, but to embed these into the very design of learning, and to actively build in future-orientedness and identity work. This is core to designing and facilitating learning that affords possibilities for people to powerfully act on the world. Agency and future-orientedness are a "societal imperative" (Edwards, Part II, this volume) for a sustainable, democratic world where people are enabled to flourish; not just be economic pawns. None of this happens simply or easily. As learners grow their understanding, they build their agency and future-orientations. At the same time, they variously change their sense of the power relations, their positioning, and their sense-making of the practices that they are a part of.

We know from our research (see for example, Edwards, 2010; Bound et al., 2016; Bi et al., 2020) and our practice as educators, that adult learners are naturally agentic. This is the case whether or not learning is designed to develop agency and identity. However, the difference we want to note here, is that our hope is for agentic learners who capably move beyond the confines of economic imperatives imposed through dominant discourses and more.

Flipping the lens to bring a focus to learners and learning requires different understandings of learning that those we have traditionally worked with. By definition, it requires very different pedagogies, power relations and end outcomes.

On this note, we invite our contributors and readers to partake in this exciting endeavor of collectively imagining, characterizing and designing pedagogies that push beyond existing paradigms of learning and teaching, that challenge pervasive delineations between spaces of work, learning and communities—to create new possibilities, futures and trajectories for our learners.

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Associate Professor Helen Bound (PhD), Institute for Adult Learning, Singapore University of Social Sciences, Singapore

Associate Professor Helen Bound is Deputy Director, Research and Innovation Division, Institute for Adult Learning. Helen's research interests focus on learning across a wide variety of contexts, including workplace learning, learning in high technology environments, professional learning and learning through collaborative activity. She is also interested in the contexts of learning and has published widely on a range of topics, including, learning spaces between classroom and work, specific pedagogical approaches and tools to support learning, competency development, professional development of continuing education/vocational teachers, workplace learning, and learning and development of non-permanent workers. Helen has a background in vocational training and education (University of Tasmania, Australia) and before that spent some years as a trade union trainer and running her own training and development business. Prior to that, her experience teaching in Australian secondary schools is the source of her deep interest in pedagogy and learning. Helen is a member of the Committee for Researching Work and Learning International Conference Series; has co-edited special editions of *Journal of Work and Learning*, is a member of the editorial and review boards for *Australian Journal of Adult Learning*; *Futuristic Implementation of Research in Education, and International Journal of Vocational Education and Training Research.* Her other books include *Towards a new understanding of workplace learning: The context of Singapore* and *How non-permanent workers learn and develop. Challenges and opportunities.*

Dr Jennifer Pei-Ling Tan OCBC, Singapore

Dr. Jennifer Pei-Ling Tan is Vice President of Learning and Development at Oversea-Chinese Banking Corporation Limited. She leads the Learning Technology and Design team at OCBC Campus that designs and drives technology-enhanced learning innovations to enable future capability build, promote learning agility, and foster a thriving learning organization for sustainable growth. Having spent the early years of her professional life in business advisory and assurance, Jen brings a unique combination of business, strategy and management skills to bear in her current role as an applied learning scientist and innovator. She has held various academic roles including Assistant Dean (Learning Analytics and Knowledge Mobilization), Programme Director (Lifelong Learning, Cognition and Wellbeing) at the National Institute of Education Singapore, and Research Fellow at the ARC Centre of Excellence in Creative Industries and Innovation, Queensland University of Technology, Australia. She forged close partnerships with schools, universities, policymakers and industry partners to design and scale technology-enhanced collaborative learning innovations that cultivate 21st century literacies, lifelong learning and wellbeing in young people. Jen is passionate about leveraging technology affordances to provide learners with more relevant, meaningful and transformative learning experiences and life outcomes. She holds degrees in Philosophy, Education, Business Information Systems, and Accountancy.

Associate Professor Lim Wei Ying, Rebekah Singapore University of Social Sciences, Singapore

Lim Wei Ying, Rebekah is Associate Professor and Director of the Teaching & Learning Centre at the Singapore University of Social Sciences (SUSS). She leads the Centre in areas of academic development of lecturers, academic support for learners, and Scholarship of Teaching & Learning. Her research interests include professional identities, teacher learning and technology-enabled pedagogy; areas in which her research grant awards and publications are based on. Her other awards include the Hewlett Packard Innovation in IT in Education, Dean's commendation for research award, and the teaching excellence award 2011 & 2013. She has served as consultant to both local schools and international bodies, such as the Commonwealth of Learning, and more recently Southeast Asian Ministers of Education Organization, Southeast Asian Regional Centre for Graduate Study & Research in Agriculture (SEAMEO SERCA) in areas of professional development and technology-enabled learning.

Part II
Framing the Issues

Chapter 3
Rethinking Learning for a High Skills Economy: What a Cultural-Historical Approach Can Offer

Anne Edwards

Abstract In this chapter Edwards outlines a Vygotskian cultural-historical approach to learning, to argue that it offers a future-oriented approach to working in and on practices that can meet the demands of twenty-first century workplaces. Emphasising the importance of learners' agency as they interpret and respond to problems in practices, she discusses how practices both shape people's actions in activities, but also how participants in practices may in turn shape the practices. A key idea is the Vygotskian notion of social situation of development, a pathway of learning which is created by the learner as she propels herself forward taking advantage of the resources available to support her learning. Successful momentum involves informed interpretation of tasks and the ability to recognise the environmental affordances that can support actions on them. The challenges of changing practices and of individuals' transitions as they orient to new tasks and demands are recognised and the implications are discussed. There is also discussion of how Vygotsky-based ideas on working relationally across practice boundaries can help with planning for and engaging in collaborations on complex problems.

Keywords Cultural-historical · Agency · Practice · Relational expertise · Future-oriented

Introduction

One way of thinking about the kinds of learners we currently need is an instrumental one: if we want to be competitive in global markets education needs to create a workforce, which will attract capital investment. Indeed, I shall argue that the ideas to be discussed will achieve that outcome; but that is not my starting point. Instead, I first invite wider reflection on the purposes of education. In late nineteenth century England, the expansion of state education served two, then contemporary

A. Edwards (✉)
Department of Education, University of Oxford, Oxford, UK
e-mail: anne.edwards@education.ox.ac.uk

H. Bound et al. (eds.), *Pedagogies for Future-Oriented Adult Learners*, Lifelong Learning Book Series 27, https://doi.org/10.1007/978-3-030-92867-4_3

instrumental purposes: educating the newly enfranchised male population and creating the organised civil service required to run the expanding British Empire. In both cases, the education offered was designed to privilege existing knowledge and the values it embodied, in order to ensure that both the newly enfranchised and the civil servants knew their places in the social order. It was therefore unequivocally backward looking in content and presentation and still shapes the pedagogies of much of formal education.

With this understanding of the late nineteenth century geo-political environment, which was echoed across much of Europe, we can recognise the radical nature of Vygotsky's educational agenda. Writing in the 1920s and early 30s in a turbulent post-revolutionary Russia, Vygotsky created a psychology, which was both Marxist and modernist: education was the key to realising the intellectual potential of the Russian people in order for them to together construct a better world. Shotter summarised this approach: 'Vygotsky is concerned to study how people, through the use of their own social activities, by changing the conditions of their own existence can change themselves.' (Shotter, 1993: 111). Here we see a focus on the future-oriented agency of people working together as they act in and on the world. They are not the agents of capital or Empire, but responsible beings, changing the conditions of their lives as their agency unfolds and their identities evolve.

We find ourselves in a different geo-political environment today, one where the societal disrupters such as Stephen Bannon and a raft of populist leaders are at play; yet there are resonances. In England right-wing Education Ministers have turned back the clock on school curricula and pushed forward testing by examination, emphasising recall over problem-solving. At the same time, we see the young and educated, as agents of capitalism, tied into unstable zero hours contracts, which trebled in England between 2012 and 2017 from 252,000 to 758,000 (Clark, 2018). The disrupters need citizens who are uncritical and insecure: those who voted to leave the European Union in the 2016 UK referendum were less likely to have university degrees and lived in areas of economic decline. Similar dynamics were to be found in the 2016 US election of President Trump. In short, shifting the lens to focus on the learner and their responsible agency is above all a societal imperative and, as I shall argue, there is much in Vygotsky's legacy to assist with that agenda.

These arguments are not to downplay the need for people who create thriving economies; indeed, healthy economies produce citizens who are less vulnerable to the disrupters. But here too there are changes, which are making new demands for new pedagogies. Singapore offers one example, and its features are mirrored across most developed economies. Because of its emphasis on education Singapore has attracted high-end knowledge-based jobs from transnational companies (TNCs). But the geo-political environment has also impacted here. Increasing supplies of degree-educated young people in the emerging economies of South East Asia, China and India are proving attractive to TNCs, which can easily shift their employment strategies to take advantage of cheaper workforces.

In their analysis of how emergent economies, able to offer both high skills and low cost, were threatening existing high-skills high-cost economies, Brown et al. (2011) identified three types of knowledge worker:

Developers: *people with high potential, around 10–15% of a workforce, who are expected to think. They include senior researchers, managers and professionals.*

Demonstrators: *people who implement existing knowledge and standardised procedures, usually using established software. They include some managers and consultants, teachers, nurses and technicians. Their focus is largely communication with clients/customers.*

Drones: *people doing monotonous work such as call-centre and data entry, where everything is pre-scripted for them. These are easily standardised and digitally supported occupations, so can happen anywhere.*

This breakdown of knowledge work suggests that the challenges for Singapore and other developed economies is not to create the passive workforce that echoes late nineteenth century priorities: the drone jobs can easily be carried out anywhere there is internet. Instead, the focus needs to be: (i) creating developers who can maintain a focus on high-value knowledge work; and (ii) enhancing the specific contributions to be made by local demonstrators, through, for example, their developing a test-bed function, evaluating and adapting existing technological knowledge, thereby adding a value that is not being met by lower-cost competitors (Brown et al., 2015). Both Developers and the extended notion of Demonstrators need to be agentic problem-solvers able to interpret demands in tasks and act on them. Creating learners who relish the challenges of a future orientation calls for attention to the agentic learner who can propel herself forwards, recognising and approaching new demands. It also requires an analysis of the practices and the opportunities for learning that they afford, both in formal education settings and in the workplace.

Environments for Learning

Like the editors in Chap. 2, I start with a focus on environments and, in particular, discuss the demands they make on learners. Shotter's (1993) summary of Vygotsky's agenda reveals the dialectical relationship between people and the practices they inhabit. This dialectic was central to Vygotsky's work: we are shaped by the expectations and opportunities available in a practice, but we also act on the practices and in turn may shape them. In Vygotsky' cultural-historical terms learning involves both internalisation and externalisation, we externalise what we know in how we act. Not only is that analysis an argument against an over-reliance on examinations and recall, it reminds us that learning is evidenced in how we interpret and act on key features in the practices we inhabit, while we learn and re-position ourselves in the practice. Consequently, practices need to be able to accommodate the changes that arise from learners' new understandings.

For those of us who work with Vygotsky's legacy practices are historical, knowledge-laden, identity forming and shaped by the values and priorities of those who inhabit them. In brief, we learn to become *this kind of practitioner* in the practices that comprise *this organisation*. Of course, we act on and may change

elements of a practice, but established practices are hard to shift. We learn to function successfully within a practice by recognising the recurrent demands they make, interpreting them in line with others in the practice and responding to them. For example, the pre-schooler quickly recognises the need to stop playing and sit at a table when it is snack time; while the new apprentice learns initially that accuracy is more important than speed in the workshop. These demands will change over time as the pre-schooler is asked to share out the snacks and the apprentice is required to combine accuracy with speed.

Interpreting and responding to the recurrent demands in a practice is central to learning; but, as Doyle observed over four decades ago (Doyle, 1983, 1986), some learners become adept at negotiating down the demands of tasks. For example, problem-solving in pairs, a high demand task, is transmuted into a class discussion, a relatively low demand task. Doing so reduces both the possibility of failure and the likelihood of learning. Flipping the lens to a focus on the learner therefore requires careful analysis of: the practices in which they might learn; how they interpret and respond to the demands in the practices; and how learners might be helped with interpretations and responses.

The dialectical nature of learners' engagement in practices, such as literary criticism in formal education or software design in the workplace, means that each learner acts in and on a practice in a unique manner, bringing their personal histories and intentions with them. Consequently, the educator's gaze cannot be fixed only on the practice or on the learner, they are necessarily intertwined. The key to understanding the inter-relationship of person and practice is Vygotsky's notion of the social situation of development. This term is found in his work on child development (Vygotsky, 1987). Nonetheless, I and others have been using it to explain learning as an agentic process of recognising and tackling problems and using resources in a practice in increasingly informed ways in order to reposition oneself more competently within a practice (Edwards, 2017a; Munk, 2019).

The social situation of development in Vygotsky's work is not an array of resources, which are there to support the learner's progress. Rather, it is always potential and is created by the learner through their agentic actions in activities in practices, as they make sense of the problems they are tackling and come to use the material and conceptual resources at hand to address them. Supporting a learner in creating their social situation of development therefore involves providing the necessary material resources, helping with the interpretation of tasks, modelling how they might be tackled, or simply answering learners' questions. Crucially, though, it is the learner who creates the social situation of development, propelling themselves forward as an active learner internalising and connecting new understandings and repositioning themselves in a practice as they interpret and respond to demands in increasingly informed ways. I am aware that I am describing a social situation of learning rather than development in its purest Vygotskian form; for further deliberation on the distinction between learning and development see Chaiklin (2003).

Holland and her colleagues have usefully elaborated how this process of learning in practices involves the navigation of what they term the 'figured worlds of practices' (Holland et al., 1998: 52). This term takes our attention to the construction of identities through actions in practices. Coined by Holland and her colleagues, the term refers to how social settings, including the workplace, are 'socially and culturally constructed realm[s] of interpretation in which particular characters and actors are recognized, significance is assigned to certain acts, and particular outcomes valued over others.' (Holland et al., 1998: 52).

In brief, people create and reinforce their identities as they negotiate their positions in a figured world of practice or navigate around aspects of the figured world they dislike. This analysis raises several questions, including how a workforce may be upskilled if what they currently do shapes their work identities. We therefore need to consider the ease with which people can (re)negotiate their positions as agentic workers within workplaces.

This short overview of how cultural practices shape and are shaped by those who inhabit them reveals that both from an institutional perspective and from an individual viewpoint, the changes arising from a more future-oriented, problem-solving approach to learning can be challenging. For example, new interpretations of familiar problems and new ways of addressing these interpretations can disrupt and destabilise a practice and provoke resistance. Resistance to the new may be even stronger when a future orientation involves negotiating new functions, such as the extension of the demonstrator role into existing configurations of practices.

The solution is not the societal disruption, which was described at the start of the chapter, there is no intention in that approach to enhance the learning and agentic actions of citizens. Instead, the opportunity for learning and repositioning needs to be built into practices which are themselves future-oriented and open to change. Brown et al. (2015), for example, discussed building 'a ladder of opportunity into the design of jobs.' (p. 38). In my own work, (Edwards & Montecinos, 2017), we discussed how educational leaders in formal education settings, by making values and purposes explicit, can create conditions for the teacher discretion needed to act responsively to support student learning and well-being.

Being a Learner

Let us now shift the gaze to the learner in the dialectic of person and practice. For Holland and her colleagues, people's identities, for example as non-drinking alcoholics, mediate how they interpret and respond to a figured world of practices; but these identities are not fixed entities. They explain: 'Cultural studies of the person... must be predicated upon continuing cultural production: a development...that is actually co-development of identities, discourses, embodiments, and imagined worlds that inform each moment of joint production and are themselves transformed by that moment.' (Holland et al., 1998: vii). Here they are pointing to implicit mediation, in the case of the alcoholics in the stories they tell each other. Wertsch

(2007) distinguishes between implicit and explicit mediation, with the former occurring in the natural language of the situation, when one engages in and with a practice and becomes *this kind of practitioner* in *this kind of practice*.

Implicit mediation is a powerful shaper of identities that fit with organisational priorities. The talk in practices contains the categorisations that reflect the purposes and values of a practice (Makitälo, 2003, 2006; Makitälo & Säljo, 2002), and new entrants find they need to learn to use those categorisations. There are, for example, distinct differences between learning to discuss clients as troublesome and as troubled, which in turn lead to distinctly different ways of working with them.

But flipping the lens to the learner requires us to dig a little deeper into the cognitive processes of internalisation, the construction of robust conceptual systems and the mediation involved. An individual's awareness and increasingly powerful deployment of conceptual tools was central to Vygotsky's Marxist psychology and his focus on learning and development. The cultural-historical approach of starting with an analysis of practice therefore does not mean ignoring cognitive processes. For example, Doyle's cognitive science rationale for attention to concept formation is entirely compatible with a cultural-historical view of externalisation: 'Available research suggests that direct instruction that concentrates on specific operations for accomplishing a task will produce immediate effects, but it is not likely to engender the higher level knowledge structures or strategies required for the flexible use of these operations.' (Doyle, 1983: 175). The Vygotskian approach to learning also similarly emphasises building knowledge structures or systems of inferences, by giving learners opportunities to connect new understandings to existing concepts. Derry's work on the 'space of reasons' (Derry, 2013: 230) is particularly helpful here, usefully connecting the implicit knowledge in practices with explicit attention to building coherent conceptual systems and potentially augmenting the idea of future-oriented pedagogical spaces discussed in Chap. 2.

Derry has reflected on how learners construct the systems of inferences, which connect concepts. She draws on Dunne's metaphor of 'the rough ground' (Dunne, 1993), to suggest that the knowledge held implicitly in practices, the rough ground, has been overlooked. She proposes creating discursive spaces, where the asking for and giving of reasons is expected, and where what is important, yet perhaps not articulated in the 'rough ground' of practice, can be surfaced and scrutinised. It is this scrutiny that enables the construction of a system of inferences. Derry reminds us of the latent knowledge that lies hidden in practices and concludes that learners can access and engage with these tacit understandings, in settings where their everyday understandings are surfaced and referenced to robust concepts, enriching the system of inferences they construct.

These discursive spaces are 'spaces of reasons' where everyone, regardless of status, has the right to ask for and give reasons. Drawing on Brandom, she explains, in cultural-historical terms, how creating a space of reasons for learners allows systems of inference to be constructed and referenced to experience and to the powerful concepts that are important tools for acting in and on practices:

> For Vygotsky concepts depend for their meaning on the system of judgments (inferences) within which they are disclosed. Brandom's careful study of concept use argues that concepts by their nature are not isolated from one another; 'to have conceptual content is just for it [a concept] to play a role in the inferential game of making claims and giving and asking for reasons. To grasp or understand such a concept is to have practical mastery over the inferences it is involved in . . .' . (Brandom, 1994: 48; Derry, 2008: 17)

Derry's analyses call for environments, which are designed to include both a mediation role for the more expert other, whether colleague, mentor or teacher, and attention to the agency, experiences and intentions of the learner. Derry does not address directly the future orientation of learners; nevertheless, her analyses, which involve, potentially at least, a questioning of the latent knowledge in existing practices, indicates the benefits that could arise if settings accommodate regular reflections on the purposes of their processes.

What are the implications of this overview of learners and the practices they inhabit? In brief, future-oriented learners need to approach and interpret problems and draw on conceptual and material tools, including other people, as they address problems. They also need to be able to negotiate what matters for them into institutional practices as they take forward their intentions, while recognising the values that shape these practices; listen to what matters to others and make their own interpretations and intentions clear; and construct identities, which involve an ability to relish change. In addition, as the opening to this chapter made clear, they need to exhibit responsible agency by being aware of the implications of their actions on others and society more broadly. The practices, whether formal or informal educational settings, need to permit, indeed encourage, the unfolding of responsible agency, as the learner propels herself forward to reposition herself in the practice and interpret and respond to its demands in increasingly informed ways. These ways of being a learner could also form a list of the soft skills that employers argue are often missing among the 'book smart' graduates of formal education (Brown et al., 2015: 38), augmenting the capabilities of both Developers and Demonstrators.

Learning and Transitions

A future orientation is likely to involve transitions between practices and will anyway arise during transitions. These movements may include starting a new job, transferring to a different unit or role within the same organisation, responding to a fundamental change in current work processes, or moving from school to university. From what I have already outlined, such transitions will involve people, regardless of age and expertise, in learning to orient themselves to addressing the implicit and explicit recurrent demands that are embedded in the changed or new practice. Hedegaard has termed this orientation 'motive orientation', recognising that it involves emotional responses as well as cognitive. She explains the concept as follows: 'Motive development can be seen as a movement initiated by the learner's emotional experience related to the activity setting.' (Hedegaard, 2012: 21).

We have all probably experienced the personal disorientation that arises when entering an unfamiliar setting and we attempt to read the figured world of practices we need to navigate if we are to function within it. For me one example was the move from working in a series of excellent redbrick English universities to the often arcane world of the University of Oxford, with its very different college system and a terminology not used outside Oxbridge. Another was when I became head of department after being director of departmental research. In my new role I needed to orient my intentions and actions to the whole range of work carried out across the department and not simply focus on ensuring we had research of the highest quality. Both of these transitions entailed a refocusing and a lot of learning, despite several decades of experience in Higher Education.

Motive orientation therefore gives direction to how people recognise, interpret and take actions to respond to the demands in a practice and is a personal response, which involves people's sense of their own competence in the field of action. Here we can connect motive orientation with the unfolding of a person's agency as they take purposeful actions in the practices they inhabit. But people will need help, making the demands explicit is one way forward.

In a recent study (Edwards & Fay, 2019) we designed a Smartphone app to be used by young people with an autistic spectrum condition (ASC) when they make the transition into the workplace and later take on new tasks while there. These young people have heightened difficulties in interpreting the implicit demands in workplace practices and the app was designed so that these demands are made explicit by their workplace buddies and can be stored on the app as constant reminders. At the same time the app captures what matters for the young person so that their buddies have insights into the current motive orientations of the young person and can help with the orientation of new workplace motives. Having an ASC amplifies the challenges of transitions between practices or changes within practices; nonetheless, attention to the reorientation of motivated actions to new recurrent demands can be helpful for all.

Learning in Sites of Intersecting Practices

The kinds of work to be undertaken by both Developers and Demonstrators is likely to be complex, involving the co-production of knowledge with experts in other areas. These collaborations may be based in established teams, but frequently they involve relatively brief just-in-time connections or working across globally distributed networks. These fluid purposeful collaborations call for an expertise, which is in addition to one's core expertise in, for example, soft-ware design or robotics.

Over the last 18 years I have examined how these kinds of collaborations are accomplished and the expertise that is involved. (Edwards, 2010, 2011, 2012, 2017b). In doing, so I have labelled the capabilities that contribute to successful inter-professional collaborations. My aim has been that the capabilities become recognised and nurtured in training programmes and other forms of continuing

work-based education. Instead of describing the processes as boundary work I have called the places where the work occurs 'sites of intersecting practices' (Edwards, 2010), where practitioners come together to solve problems; while sustaining the expertise they have accumulated in their home practices. I now outline the capabilities I identified as key to successful, fluid collaborations.

Relational Expertise is the first and overarching capability. It is a capacity to work relationally with others on complex problems. Crucially, it involves the joint interpretation of the problem as well as the joint response. The problem is collectively expanded to reveal as much of the complexity as possible and responses to the expanded problem are orchestrated. Relational expertise therefore involves knowing how to know who can help and how to work with them.

Lundvall, discussing what he called the learning economy, indicated the importance of know-who, to augment know-what, why and how in the following way: 'Know-who involves information about who knows what and who knows to do what. But especially it involves the social capability to establish relationships to specialised groups in order to draw upon their expertise' (Lundvall, 1996: 6). His premise was that knowledge is a collective asset that can be shared, and therefore we should create the conditions for such sharing. This, sharing involves recognising that each collaborator will have different expertise, and systems need to be designed to enable flexible forms of collaboration.

In this context, relational expertise means knowing how to recognise the expertise of others and to be able to make one's own expertise explicit. It involves being professionally multilingual, recognising the meanings that different practices give to words and their importance in each practice discourse. In brief, it is a capability that can be broken down into being able to: (i) recognise the professional motives of those who inhabit other practices; or equally the motives of clients; and (ii) align your motives with theirs when interpreting and responding to a problem.

Common Knowledge in my definition consists of the different professional or personal motives of collaborating participants and becomes a resource that can mediate joint work on complex problems. (Edwards, 2010, 2011). It is not knowledge of how to do each others' jobs; that route leads to hybridity and the loss of specialist expertise. Instead, common knowledge, in the sense used here, is made up of what matters in each practice, the motives that shape and give direction to people's actions. It is constructed and reconstructed in use on problems, while it mediates joint actions on the problems. Common knowledge does not arise spontaneously; attention needs to be paid to the conditions in which it is built. My own work suggests that it is created in interactions in sites of intersecting practices, which overtly emphasise the following:

- recognising similar long-term general aims, such as children's well-being, as some kind of affective or value-laden glue that holds all motives together;
- revealing specific professional or personal values and motives in discussions, by legitimising asking for and giving reasons for interpretations and suggestions; and
- listening to, recognising and engaging with the values and motives of others.

Understanding professional and client motives is helped by establishing ground rules in the sites of intersecting practices. Derry's spaces of reasons already discussed and the future-oriented pedagogical spaces mentioned in Chap. 2, may be sites where such ground rules are agreed and employed. Certainly Derry's emphasis on asking for and giving reasons is likely to help the construction of common knowledge as a resource that consists of the motives or what matters for potential collaborators.

Relational Agency is a form of joint agency when taking action (Edwards, 2005, 2010, 2012, 2017b). Common knowledge helps when planning and implementing a plan, but it is also important when actions need to be taken quickly to deal with a problem or unexpected demand. It builds on the groundwork established through the exercise of relational expertise so that common knowledge becomes a resource that allows carefully negotiated responses to an immediate problem.

Recently these three ideas have been tested by other research teams. For example, Seppänen and Toiviainen have discussed how relational agency informed their analyses of how networked workers created resources to enable joint knowledge work (Seppänen & Toiviainen, 2017). They concluded that '. . .relational agency may significantly contribute to the emergence and shaping of collaborative tools. . . . [and]. . . offers insight into the developmental phase and learning potential of service networks . . . and [it] highlighted how professionals use these tools to maintain and transform their service networks.' (Seppänen & Toiviainen, 2017: 170). These tools carried the common knowledge that mediated collaborations across practices. Efforts at building common knowledge were therefore seen as necessary pre-requisites to the exercise of relational agency. The relational ideas were also tested in range of occupations including implementing IT reforms in Danish schools; enabling the functioning of a variety of networks based on Australia; Finland and the UK; negotiating organisational change in South Africa; and underpinning successful school leadership in Chile (Edwards, 2017b).

These relational capabilities exemplify some of the soft skills that appear to be lacking in 'book smart' knowledge workers (Brown et al., 2015) and are also central to the client-oriented work of Demonstrators. In this regard Tsoukas (2009) makes an interesting distinction between 'relational engagement 'and 'calculated engagement' in his analyses of dialogic work in organisations. In the former, actors have favourable expectations of their dialogue partner and have what Tsoukas terms 'productive dialogues'. In the latter there is minimal cooperation and the focus is protecting one's own interests and dialogues are not productive. In relational conversations differences are not downplayed, but indeed become the springboards for knowledge production. A relational standpoint does, I suggest, have to be learnt. In addition to helping when tackling complexity, it reminds us that flipping the lens to focus on the agentic learner does not mean creating the learner as heroic individual.

Implications of a Cultural-Historical Approach to Flipping the Lens to Learners and Learning

Implications for Formal Education A cultural-historical approach to learning emphasises active learning; but this is not a relativist notion of radical constructivism. Instead, access to powerful knowledge, the flexible learner-centred roles of teachers, and the environments created for agentic learners are central. There are implications here for task design and sequencing (Edwards, 2014) and for teaching in schools, universities and workplaces. All too often the teacher's role is seen as either expert deliverer of a curriculum or guide-by-the-side following the learner. The former can emphasise knowledge over learner agency and the latter may downplay the importance of access to powerful knowledge, through its focus on the agentic student. Instead of this polarisation, we need to recognise: (i) the changing roles of teachers as learners create their social situations of development, so that there is a gradual withdrawing of teacher guidance while learners' agency is exercised and their identities as successful learners in control of their own learning is nurtured; and (ii) an expansion of the teacher role to include attention to the demands embedded in the tasks offered to learners and the resources, conceptual and material, that need to be made available so that the demands may be recognised and addressed.

Implications for Workplace and Work-Based Learning The approach also suggests that flipping the lens from teaching to learning has considerable implications for how learning is enabled by workplace practices, and therefore for organisational leadership (Edwards & Montecinos, 2017). If learning involves repositioning oneself within a practice, moving into a new practice, or co-producing knowledge in distributed networks, then practices need to be configured so that they can accommodate these ways of engaging and, in addition, offer ladders of opportunity within specific roles. In brief, active learners should be able to negotiate their positions, and the knowledge they bring, in ways which take the aims and purposes of the organisation forward, rather than learn to navigate their routes round obstacles and limit the contributions they might make.

Importantly, therefore, flipping the lens to a focus on learning is not simply a question of empowering the learner through offering new ways of thinking, and indicating the implications of these ideas for their actions in activities in and across practices. Agency, the purposeful externalisation of understandings, is necessarily negotiated in practices. Ignoring the potential agency of employees, or blocking their agentic actions, prevents learning. Equally, these negotiations require leaders to make their organisational purposes clear so that workers may align what matters for them as agentic actors with what matters for the organisation (Edwards & Thompson, 2013).

Societal Implications The chapter started with a reflection on what kinds of citizens are needed to counter the worst excesses of the societal disrupters. My argument was that a form of education that promoted human agency, collective responsibility and a

capacity for informed problem-solving was an important part of the way forward. The chapter has largely considered the pedagogical implications of a Vygotskian approach to achieving these educational goals in either established or changing practices. The previous section, however, took us out of practices into the more fluid arena of sites of intersecting practices to identify the capabilities required for collaboration on complex problems with other practitioners or clients.

I would like to end the chapter by a reflection on how these relational capabilities are societally relevant, as we so frequently counter the impact of the disrupters by shoring up the boundaries around 'people like us', living in bubbles where our prejudices are reinforced. Benhabib, in her work on communicative ethics, offers a way forward when she explains how an ethically grounded discursive rationality is produced. In doing so she offers some ground rules that are not only relevant to future-oriented learning, but also to how we may continue to live and work together. In brief, learning involves listening and talking to others, while grappling with novelty alongside them. In focusing on the learner we are therefore not creating a licence for the narcissism that Taylor warned us against when writing about the 'slide to subjectivism' (Taylor, 1991: 55). I leave the final words to Benhabib.

> In conversation I must know how to listen, I must know how to understand your point of view, I must learn to represent myself and the other as you see them. If I cannot listen, if I cannot understand, and if I cannot represent, the conversation stops, develops into an argument, or maybe never gets started. (Benhabib, 1992: 52)

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Professor Emerita Anne Edwards, University of Oxford, Department of Education, UK

Anne Edwards is Professor Emerita at the University of Oxford, Department of Education. A previous Director of the Department, she holds honorary doctorates from the Universities of Helsinki and Oslo. She is also a Fellow of the UK Academy of Social Sciences and of the Learned Society of Wales. Her most recent writing, drawing on cultural-historical theory, has involved collaborations with colleagues in Australia, Chile, Denmark and Norway as well as the UK. Her work over the last fifteen years has centred on relational expertise and collaboration across practice boundaries and professional learning. She is currently working on a book with Mariane Hedegaard on relational pedagogies to be published by Cambridge University Press.

Chapter 4
Learning in a Designed World: Symbolic Technologies and Epistemic Practices in the Evolution of Professional Knowing

Roger Säljö

Abstract Throughout human history, people have invented technologies-intellectual and physical-that have reshaped our world and our activities. We create artifacts (hammers, bicycles, excavators etc.) that extend the powers of our body beyond what nature has given us. The same applies to intellectual activities, our epistemic practices rely on collaboration with symbolic technologies; we use texts and databases to remember, calculators to perform mathematical operations, and search engines provide resources for finding information. Thus, we live in a world that is designed, and technologies are our habitat. Learning and knowing in such a world implies engaging with increasingly powerful symbolic technologies that are integrated into work practices and that serve as instruments of thinking, problem-solving and competent performance.

Keywords Symbolic technologies · Professional learning · Epistemic practices · Conceptual and material tools

Introduction

All societies and communities need to have mechanisms for reproducing the knowledge, skills and identities that have emerged through past experiences. Later generations, metaphorically speaking, stand on the shoulders of their predecessors as they profit from previous insights when they go about their everyday activities at work, at home and in other settings. In most activities, there will be no need to reinvent material and immaterial resources central to knowing in these settings, such as paper and pencil, calculators, writing systems and ways of organizing information in texts, tables and charts. Indeed, most of these resources we take for granted as natural facts of everyday life; they are simply there. Very few people have any idea of the origin

R. Säljö (✉)
Faculty of Education, University of Gothenburg, P. O. Box 405, Gothenburg, Sweden
e-mail: roger.saljo@ped.gu.se

H. Bound et al. (eds.), *Pedagogies for Future-Oriented Adult Learners*, Lifelong Learning Book Series 27, https://doi.org/10.1007/978-3-030-92867-4_4

or development of techniques for writing over the millennia (Schmandt-Besserat, 1996), or when people first began to systematize information in tables (Robson, 2003).

An important element of the socio-genesis of our knowledge and skills is the uniquely human capacity to embed significant elements of what we have learned in artefacts and technologies. Humans are toolmakers, transforming the world they inhabit. Bicycles, cars, trains and other means of transport reorganize how we travel and extend our capacities to move around and, thus, broaden our horizons of experience. Artefacts such as spades, rakes, excavators and bulldozers transform how we use our bodily resources when cultivating land, designing a garden or building a house. What once used to be heavy physical work, such as digging and transporting soil, has been remediated through a chain of technological inventions with significant consequences for the organization of work. For instance, using a modern, computerized excavator neutralizes the role of physical strength when performing such work; a physically weak person will be as efficient as someone who is stronger.

This process of developing technologies through remediation is fundamental to collective and individual learning. When people adapt to–appropriate–the technologies of a complex society, they buy into, to use a commercial metaphor, developments that have taken place during centuries, even millennia. This type of socio-genetic trajectories, however, is not limited to the role of physical artefacts in supporting bodily capacities. Also intellectual or, in Vygotskian (1978, 1981) parlance: cultural, tools play a similar role of transforming mental activities. Remembering is remediated, and greatly facilitated, through the use of paper and pencil, photos, texts and databases. If our capacities for remembering had been limited by what we can keep in the human memory, the cumulation of knowledge and skills in society would have been severely restricted. Memory practices involving the use of such external resources are very diverse and rely on our capacities to creatively search and find what we are looking for in the external resources available to us. When recalling events, experiences and information we no longer have to limit ourselves to searching our own, personal memory. Memory practices that involve reliance on external resources differ sharply from those studied in the classical experiments in memory research, which still in many cases follow the tradition of viewing the human mind in isolation as the object of research (Mäkitalo et al., 2017).

Along similar lines of remediation, multiplying two two-digit numbers with two decimals is quite a challenging mental arithmetic exercise, which becomes far easier with paper and pencil, and close to trivial with a calculator (Säljö et al., 2006). In a Vygotskian (1978) perspective, cultural tools of this kind serve as "cognitive amplifiers" (Nickerson, 2005) that reorganize earlier forms of mental activity. As Vygotsky (1981, p. 139) put it, an artificial tool often "abolishes and makes unnecessary a number of natural processes, whose work is accomplished by the tool." The outsourcing of mechanical operations that characterizes the use of a calculator when multiplying exemplifies one of many such transformations. Thus, mental activities rely on artefacts in very much the same way as do physical activities, and when new resources come into use, our mental (and communicative) activities are transformed; i.e. new epistemic practices emerge.

Following Donald (1998, 2010, 2018), while maintaining the Vygotskian spirit, we may refer to the tools that intervene into our intellectual activities as "symbolic technologies." A symbolic technology is simultaneously ideal and material as Cole (1996) puts it; it is socio-material with signs/inscriptions added onto a physical surface or object: letters on a page or a rune stone, numbers on a ruler and symbolic notations such as W, E, N, S on a compass. Thus, humans are sign-makers as well and in this kind of tool-making, materiality is an important constituent of creating, manipulating and preserving symbols, ideas and insights. From the point of learning and knowing, what is interesting about these symbolic technologies is that they are in some sense external, but at the same time they are integrated into what we know and how we know—they are part of our "extended mind" (Clark & Chalmers, 1998). Our knowledge and our intellectual practices are not exclusively between our ears, they build on an active and almost continuous, often seamless, collaboration with symbolic technologies. As Donald puts it, our minds are hybrids of a very special kind.

Hybrid Minds, Epistemic Practices and the Attunement to Symbolic Technologies

The idea of a hybrid mind has several important implications for understanding human development and learning. The concept of a hybrid mind implies that the mind (and the person) operates in collaboration and coordination with external resources (including other people). Thinking in this sense is not reduced to an internal, mental activity, but is achieved through collaboration and coordination with external resources that have emerged in society through history. Or, to put it concretely, when we think, plan and reflect on what to do, we turn outwards to symbolic technologies such as texts, databases and other cognitive amplifiers.

An added, and very important, element of this view of learning and development that I will explore here in some detail is that cognitive (and physical) practices are shaped through interaction with symbolic technologies, i.e. they have their sociogenesis in a prolonged exposure to, and interaction with, culturally specific symbolic (and socio-material) technologies. Thus, cognitive processes are not vacuous, general processes of dubious ontological standing operating in the brain/mind. They emerge through extensive interaction with and mastery of symbolic technologies as a constituent of epistemic practices. On a grand scale, writing is a good illustration of the consequences for human thinking of this exposure to specific epistemic practices, and how we come to know, in the sense that it is a technology of remembering, documenting, analysing, formulating and sharpening ideas, engaging in practices of problem-solving and so on, as Walter Ong (1982), Jack Goody (1987) and others have pointed out. As Goody (1987, p. 3) argues, practices of writing changed the world, and, by doing so, they also changed the ways in which users of the technology think and act: "systems of communication are clearly related to what man can make

of his world both internally in terms of thought and externally in terms of his social and cultural organization." This is thus not a claim about how social activities and cultural tools *influence* thinking, it is more radical in the sense that the claim is that symbolic technologies are *constitutive* of cognitive practices.

On a micro-level, and in a historical–socio-genetic–perspective, such transitions are interesting to follow when trying to understand the socio-material origin of how we think in situated activities. Returning to the documentary practices of tables and tabular representations as an illustration, such devices for creating and organizing information emerged in the historical context of the invention of writing in Sumeria some 4500 years ago (Campbell-Kelly et al., 2003). Tables are technologies by means of which representations of the world are codified in two dimensions—rows and columns. In this sense the table, and the unit of a cell, is different from a list of single items. What happens when we organize the world in rows and columns represents a different kind of abstraction and a radical reduction of the complexity of the outside world. The unit created in the table–the cell–is information of an abstract, and at the same time specific, nature, which does not necessarily have any physical existence. The heading could represent goods (grain, sheep) or services rendered, while in the rows the names of buyers or sellers can be inserted to map activities. The table in this way organizes a complex world and serves as a documentary resource, which can be saved and returned to, when needed. It functions as a tool for remembering, a mode of organizing the world and as a category that can be enacted in social practices.

In addition to documenting information about transactions, the tabular format introduced during this time thus began to serve as an important thinking tool where the information in the columns and rows could be summarized horizontally and vertically, cross-tabulated, followed over time and analysed in different ways. These procedures paved the way for important abstract functions enabled by documentary and analytical practices such as calculating gains and losses and controlling and auditing large numbers of transactions, activities which could only be carried out by means of such external support in the hands of a knowledgeable user.

Tabular representations of this kind must be seen as major cultural and intellectual breakthroughs with consequences for the future and for activities in the many corners of society where tables are used. They qualify as "epistemic tools" that have been used to "to shape inquiry and knowledge producing action" (Markauskaite & Goodyear, 2017, p. 242) over millennia. They are also predecessors of spreadsheet software in the digital age. Appearing in the 1970s, the spreadsheet represents a continuation of the paper-based table in terms of how the information is organized in two dimensions on the screen. But in a sociogenetic perspective, and even though the "screen of a personal-computer shares the two-dimensional character of a writing surface", it has "two additional properties—easy erasure, and the ability to act as a 'window' onto a much larger virtual surface", as Campbell-Kelly (2003, p. 324) points out. Easy erasure implies that the information can be modified and reorganized to provide new information. This flexibility implies that the user without much effort can manipulate the values in order to analyse the consequences of

modifications, and, in addition, he or she can ask "what if" questions, as Campbell-Kelly points out. From a cognitive, and practical, point of view this is a very significant feature of the spreadsheet in the sense that "what if" questions are central elements of activities such as modelling, planning and thinking hypothetically about the world, for instance when making decisions on investments or other economic transactions and when attempting to predict future developments. "What-if" questions open up opportunities for analysis, consideration and anticipation of alternatives and for reflection and learning.

The capacity of the spreadsheet to work as a "window" onto a virtual world implies that it operates as a resource for managing and analysing an infinite number of data sources and databases where the logic of the organization of information in spreadsheets is functional. The spreadsheet operates as a key or grid that stretches out into a world of data and databases that is formatted in compatible manners. Databases may be designed, built and exchanged, and they may be bought and sold across the world just as any other commodity. The operations to be performed by users are structured partially through the particular formatting, partially through the interests and capacities of the user in a situated practice. Both elements of the activity are necessary: symbolic technologies and capable human minds in search of information or knowledge in goal directed activities.

This hybridity of the mind makes humans extremely versatile and flexible in terms of their cognitive capacities. The opportunities that have become available through digital technologies add to this flexibility. Information can be accessed, shared and combined in a multitude of ways, and "what if" questions may be asked and explored in dynamic and iterative ways through modelling, simulations, calculations and other expansive activities.

A related and similar example of the intimate interrelationships between minds, epistemic practices and socio-material artefacts is the transformation that texts have undergone over the past 1000 years or so when incorporated into new activities. The evolution of the design of texts, and even of a page in a text, testifies to the intimate relationships between artefacts and cognitive practices. For instance, up until the eleventh or twelfth century, the *scriptio continua* was used for writing. Thisimpliedwritingwithoutwordseparationandwithoutanykindofpunctuation (Saenger, 1997). Considering that most texts were written in Latin, and that reading was done aloud, the reading of such texts was a struggle that occupied the full attention of the reader. He or she had to actively search for word separation while reading without any kind of support in the text, and then decide when and where to make appropriate micro-pauses in order for the text to be intelligible for him−/herself and for the listener. This made the reading process extremely complex. What emerged in the late Middle Ages, however, was a new technology of writing:

> Word separation, word order, emblematic punctuation, discrete clauses, the ordering of both words and clauses within complex sentences, and the use of conjunctions and adverbial conjunctions for the construction of compound and complex sentences all facilitated sequential understanding of meaning successively within the boundaries of clause and sentence. (Saenger, 2003, p. 131)

In other words, instead of a continuous representation of language in writing, as when speaking, the sentence and the clause became significant units of written communication. The sentence is in this sense a socio-material invention with considerable consequences for how we think (Parkes, 1993). This technique implied that writers made claims and communicated what they wanted to say by designing sentences and clauses that served as some kind of idea-units subordinate to a more general message. This greatly facilitated communication of ideas, the understanding of relationships between parts of the text and reflection on what was written. Through this communicative format, the author and the reader would focus on the same patterns of meaning-making, built into the text by the author and easily identified by the reader. The skilled reader would focus on extracting meaning and understanding arguments and claims, and he or she learned to rely on sentences/clauses as the building blocks of communication and thinking. This significantly reduced the cognitive load of reading and meaning-making.

Other structural changes of texts were implemented by introducing features such as a table of contents, chapters, headings, paragraphs and indexes (Hamesse, 2003; Rouse, 1976), inventions that also supported meaning-making and flexible uses of texts for different purposes.

Many of these highly significant changes took place as a consequence of the new motives for reading and using texts that emerged in universities. In this new institutional and professional setting, the goals of reading were learning, understanding and conceptual development, rather than memorization of dogma as it had been in the reading practices of the church, where religious texts were to be accepted and followed, not scrutinized for the truth or relevance of their claims. Thus, new motives for reading and new epistemic practices associated with scholarship provided the social context in which a particular technology was revised.

Incidentally, the development of indexes and registers (of authors, terms etc.) is a socio-material invention that triggered ways of relating to information and texts that in some respects are similar to what happened through the emergence of tables. By using indexes, texts could be read in new ways. The reader did not have to follow the linear structure of a text but, rather, could search for relevant items and pieces of information. This facilitated selective forms of reading where readers could find what was of immediate relevance for their purposes while reading, and made it easier to cope with the increasing flow of publications that began to appear already before book printing. A quick look through the index would provide information if the book contained anything useful for the task at hand in a professional practice, for instance when preparing a lecture or a sermon. The indexes and registers may also be seen as predecessors of digital search engines; large pieces of texts can be scanned in the search for specific terms, names, numbers or whatever the reader is interested in. In both cases, queries have to be formulated to direct the search, but in our digitized era the amount of texts that may be covered is of a different magnitude, and the search is carried out by a digital agent.

Against the background of an interest in understanding learning in complex societies, developments of this kind illustrate the limitations of many of the theories and perspectives of learning that have dominated research over the past 150 years or

so. Skilled performance in contexts where symbolic technologies play a decisive role for competence is neither about behaviours, nor about cognitions in the sense in which these have been studied in dominant research paradigms in cognitive research; it is about epistemic practices and "epistemic fluency", i.e. the ability "to understand, switch between and coordinate different ways of knowing with awareness, sensitivity to the situation and skill" (Markauskaite & Goodyear, 2017, p. 65). An important consequence of this hybrid nature of the human mind is that thinking, sign-making, remembering, problem-solving and other intellectual activities are not localized in the mind; they emerge through collaboration with symbolic technologies in joint activities where we learn to attune to the affordances available. Without the symbolic technology, the mind cannot productively handle most of the practices of thinking, remembering and analysing that we engage in. And learning cannot be reduced to acquiring and processing information that is to be stored for future use as Sfard (1998) pointed out in her analyses of metaphors of learning characterizing cognitive traditions. We have access to a wealth of information that is not stored in our minds, and we can operate on it and utilize it for practical purposes without ever "storing" it, in the sense of keeping it in our mind over time.

Professional Learning as Attunement to Digital Symbolic Technologies

Attempts to reclaim the interest in learning as an everyday concern in social practices, rather than as something that is studied in laboratory-like conditions, implies scrutinizing the social and technological embeddedness of human activities, and how we learn to coordinate actions for particular purposes in designed environments. There is no simple "it" that we can refer to as "learning", rather learning is an emergent feature of any kind of activity, and it is diverse in nature and contingent on what is locally relevant to achieve. It is not necessary to assume that there are new pieces of information acquired or that new concepts have to be appropriated for a situation to provide a learning experience. Insights often emerge through the reorganization of what we know, and the situated realization of the relevance of a particular perspective that we, or our partners, hold in a given activity.

Professional knowing, which is generally achieved through intimate collaboration with symbolic and physical technologies, is a good illustration of this reliance on designed artefacts. In the literature, there is a wealth of studies that illustrate the processes by means of which people appropriate professional knowledge by processes of attunement to relevancies of local practices and by gaining insights into how to structure situations in a professional practice under novel conditions (cf. e.g. Billett et al., 2014; Markauskaite & Goodyear, 2017).

In a series of studies by Asplund and colleagues (Asplund et al., 2011) Rystedt and colleagues (Rystedt et al., 2011) and Lymer and colleagues (Lymer et al., 2014), these processes of adaptation to and coordination with novel technologies as

elements of professional development are analysed in the context of medical work, more specifically in relation to the incorporation of digital imaging techniques in care. Avoiding technicalities, this research followed the introduction in care of a radiographic technique referred to as chest tomosynthesis. This technology produces projections of the chest through digital images of areas of the chest, and the topic of research is how professionals (physicians, nurses, radio physicists) learn to discover pulmonary nodules (small, potentially cancerous, objects in the lung tissue, cf. Lymer et al., 2014). In comparison to regular chest radiography through X-rays, the advantage of tomosynthesis is that it avoids the problem of overlapping anatomy (ribs and other structures), which makes it difficult to detect nodules that may be hidden behind such structures of the body. Also, the technology makes it possible to detect nodules at a very early stage. In comparison to more established technologies, such as computed tomography (CT), the advantages of tomosynthesis is that it reduces the radiation dose and the cost is much lower than with CT. However, the images in tomosynthesis have a lower resolution than in CT, and this is something that is of professional relevance and that the experts have to accommodate to when taking decisions.

An interesting feature of the introduction of tomosynthesis in care studied in this research is that this technique requires adaptation of visual practices. For instance, detectability of nodules, especially small ones, is "significantly higher for chest tomosynthesis than for chest radiography" (Asplund et al., 2011, p. 504). In the research, practitioners (with varying degrees of experience of tomosynthesis and radiography) analysed images in training sessions and marked (scoring 0 to 4) whether they found an observation to be a nodule or not (with 4 indicating a strong possibility). As a second step, the participants discussed their judgements in order to arrive at an understanding of why their evaluations may have differed. The discussions in these sessions indicate how the new practices of seeing imply reorganizing the meaning of observations in order to achieve a reasonable, inter-evaluator agreement in the new environment.

When looking at the tomosynthesis images the participants accounted for what they had seen, and why they came to a specific evaluation (0–4). In this excerpt the participants comment on a nodule they think they "should have caught" (i.e. seen in the tomosynthesis image). When the excerpt begins, they look at the computed tomography (CT) image (which served as a base-line).

Excerpt 1

129	Mia:	°**let's go and, ah that was image fourty-four**° ***coronally**
		**begins preparing for display of coronal view on CT* →
130		((two lines omitted)*
131	Mia:	***that's how it looks in the [coronal-***
		cursor circles nodule on CT
132	Mae:	**[one should have caught that one**
133	Eve:	yeah °**one would think so**°

134		(1.1)
135	Mae:	***but it is like you say* the tomosynthesis image is not sharp**
		turns to Eve, then back toward Mia
136	Mae:	**in that area**
137	Mia:	**no**
138	Mae:	***one experiences it as very (0.5)* blurry**
		palms placed vertically opposite each other in front of face
139	Sue:	**yes**
140	Mia:	**m**

Adapted from Lymer et al. (2014, p. 195)

The discussion illustrates how the participants reconsider their evaluations and reorganize their perceptions. In lines 132 and 133 Mia, Mae and Eve agree that they should have discovered a particular nodule (**one should have caught that one** and **one would think so**). This implies that when seeing the same part of the chest with a technology that they are accustomed to (CT) the nodule in question is clearly visible for them, but with the new technology they failed to identify it. Interestingly, their discussion continues by reflecting on why this happened, and their conclusion is that **the tomosynthesis image is not sharp** and ***one experiences it as very (0.5)* blurry**. Here the participants experience and comment on the limitations of the tomosynthesis technique in the sense that it has a limited area of sharp resolution in comparison to the CT, and, thus, they re-specify their mistake in terms of a specific condition of the new technology. This observation may also be seen as an element of a learning experience in the sense that they notice the concrete implications of a specific difference in how the two technologies mediate information; in one case we detected the nodule, but in the other case we missed it.

Later on in this discussion (not included here, see Lymer et al., p. 196), they also discuss the anatomical background of why they missed the nodule (which had to do with the fact that they took it as a feature of the skeleton, and not as a nodule separated from the skeleton). As the authors point out, the "articulation of a (faulted) perceptual-propositional attitude is re-specified as a conclusion of a sequence of lived work" and as a result of an "active 'ambulatory vision' of virtual movement within the visualized body" (Lymer et al., 2014, p. 196) in the sense that the technologies (both of them) are used for inspecting various parts of the body in shared work. Thus, what we see in the process is not "an account of individual perception", rather what is seen and attended to is "recognizable and shared experience" (loc. cit.) of attunement to technological affordances, and, thus, learning of "actionable understanding" (Markauskaite & Goodyear, 2017, p. 305) in a tool-mediated professional practice.

These processes of attunement to actionable understanding and professional epistemic practices, thus, are visible for analysis in situations where there are some kinds of disruptions of established practices and work-habits among experts, or when newcomers to a practice learn how to interpret a specific symbolic technology. In the latter situation, the presence of a guide or a teacher scaffolding the process of realizing the nature of understanding expected may be necessary, at least in cases

where the level of expertise is not so high as in the tomosynthesis case above. This testifies to important elements of many, if not most, symbolic technologies: they are not self-instructive and they present the user with hurdles that have to be overcome.

Gegenfurtner et al. (2019) analysed a situation, again in the context of radiography and x-ray technology, where newcomers in an intense learning session were trained to identify critical elements of normal lungs vs. lungs that indicate pneumothorax (an anomalous aggregation of air or gas in the pleural space between the lung and the wall of the chest that is potentially very dangerous). In the case of a suspected pneumothorax, there are various indicators that can be searched for on the x-ray image. One of these is a very thin white line, referred to as the pleural line, which is generally very difficult to identify for a newcomer. Another indicator of this condition is that rib spaces may be more or less collapsed.

The study followed how a medical expert within one session instructed newcomers in practices of seeing what is relevant to pay attention to when attempting to identify the pleural line. When inspecting the X-rays in a lightbox, the task of seeing the pleural line was challenging for the newcomers and they were obviously struggling in the situation. The expert (Oliver) used various techniques to facilitate the discrimination between colours and structures that is necessary in this dense perceptual field. These scaffolding techniques included activities such as zooming and highlighting, rotating the image and negotiating colour categories, supportive work that was achieved through language, bodily gestures and movements (Gegenfurtner et al., 2019). In the excerpt below, Oliver encourages the "enla:rge" the image as a means of facilitating seeing the pleural line.

Excerpt 2 (1.1 in original)

01	Oliver	so (.) do you find the white line? (0.6) or not (1.4) you have to go closer.
02	Ben	*((approaches the lightbox))*
03	Oliver	you have to enla:rge [the image [(0.3) you have to focus right. now. (,)
04	Dan	*[((approaches the lightbox))*
05	Alma, Carl	*[((approach the lightbox))*
06	Oliver	otherwise you cannot¿ see the belt

Gegenfurtner et al. (2019, p. 283)

Throughout the instructional situation, Oliver insists on the necessity of actively interacting with the X-ray in order to learn. In the excerpt, the participants move closer to the image and this is a strategy used by Oliver to make the newcomers engage in "zooming", i.e. focusing on the relevant parts of the image. An interesting point here is that zooming is a practice frequently used in the context of digital images, but since the X-ray is not digital, the zooming takes place by physically moving closer to the image in order to facilitate inspection of the parts that are of relevance. Oliver also uses his hands, fingers and a wooden stick to "highlight" what

parts of the image are to be foregrounded but which do not necessarily dominate the image as a perceptual object. As the authors point out, "salient but redundant features of the image are deemphasized, even though they may stand out because of sheer size or brightness" (p. 284). Again, "highlighting" is a frequent feature of how a digital image is enlarged in order to focus on what is relevant to attend to, but in this case, the instructor uses his body and an artefact used for pointing.

An interesting feature of the scaffolding provided in this example is that Oliver uses the term "the belt" (and on other occasions, "the white line") as a semiotic resource for grounding what is to be seen (the pleural line) in a language that is less medically correct but more informative in a learning situation, where the newcomers have no clear understanding of what they are expected to see. Terms such as a white line and a belt provide concrete guidance of what to look for in the image, and thus may serve as a bridge to realizing what is of relevance.

In the scaffolding referred to as "rotating", the image is turned upside down to create a different visual object that in a sense alienates the viewer from seeing it as an image of a lung. As the authors point out, this "spatial reconfiguration achieved through flipping and rotating the image may help reduce the X-ray film to its basic features of white, grey and black structures" (p. 285). Freeing the viewer from looking at a lung as an anatomical object, thus is a strategy for making it easier to search for the particular object that is in focus, and that should appear through its distinctiveness in terms of colour and the fact that it appears as "a line".

The measures that the instructor takes in this session imply that he attempts to provide experiences which attune the newcomers to a specific professional practice, discovering a medical condition. He does this through a range of verbal and non-verbal resources that are adapted to learning to discriminate what is relevant to perceive. This goal of the particular activity, thus, is different from merely looking at or using the X-rays. Attunement is the outcome of invoking activities that vary the perspective from which you look at the image, by zooming and rotating, and by using an everyday language (white line) that makes the feature that is of interest in the rather complex image easier to spot. And, in the empirical material the progress of the newcomers with respect to being able to detect the pleural line is obvious.

Part of the instructional work in the context of symbolic technologies implies attempting to put users in a position where they are able to profit from the resources built into a symbolic technology. This road towards what Goodwin (1994, 1997) calls "professional vision" may be long and may not have any definite end where the symbolic technology has been appropriated in full. There usually are levels of expertise, where some level will do for one professional activity, while other levels are necessary in more specialized settings. The uses of imaging in medicine illustrate this well, since many clinicians will have the skills to read X-rays or other imaging technologies at a general level, while in other situations the professional responsibilities will require further specialization.

The digitalization of symbolic technologies also changes their power and versatility as is illustrated by the capacities introduced through the search engine and the modern spreadsheet. In instructional settings, digital resources may provide contexts in which active engagement with what is to be learned in professions is possible in

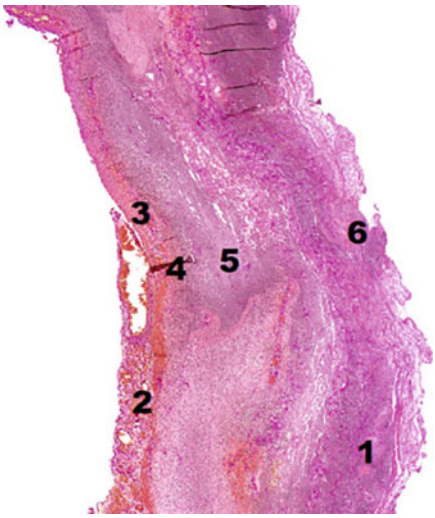

Fig. 4.1 Gallbladder (numbers indicate points of the image inspected by Pete and John and referred to in the excerpt)

novel ways. The possibilities to modify, manipulate and preserve information as part of ongoing learning activities often make the symbolic technology into a dynamic partner in exploring and learning how to make and test distinctions of relevance for professional activities. In the following excerpt, some elements of these affordances of a technology, in this case a web microscope, appear as two medical students, Pete and John, inspect a (virtual) specimen from a haemorrhagic, inflamed and necrotic gallbladder (Fig. 4.1) (cf. Nivala et al., 2012, for a more detailed account).

Excerpt 3

200 Pete: Blood, quite much at least.
201 (1.1)
202 John: Uhm.
203 (2.2)
204 Pete : Haemorrhage. ((Writes down.))
205 John: ((Moves up towards 3, Fig. 3.))
206 John: Yeah. ((Moves back towards a previously inspected area, 4,
207 Fig. 3.))
208 Pete: [(Lifts hand to point.) What?
209 John: [What?
210 John: ((Stops, zooms further in 4, Fig. 3.))
211 (4.5)
212 John: What could those be? (0.6) ((Zooms even further in 4, Fig. 3.))
213 Pete: I don't know.

214 (4.6)
215 John: ((Zooms out, moves right towards
5, Fig. 3.))
216 Pete: [Isn't this now at least some necrosis, or
fibr. . .
217 John: [((Stop, zoom in, zoom out))
218 Pete: Because there is like [no. . .
219 John: [Well there are no cells.
220 [((Waves mouse cursor at
5, Fig. 3.))
221 Pete: Yeah.

In this excerpt, we follow the intense interaction between the students and their epistemic practices as they engage in joint reasoning by exploiting the potentials of the particular symbolic technology of the web microscope. They move around the picture, zoom in and out at places of interest, and they use their hands, the mouse and the cursor when trying to establish what they see and when attempting to reach an agreement. They introduce shared biomedical knowledge and terminology and move the discussion forward by examining the image while posing questions (208, 209 and 212), making suggestions and claims (204, 216, 219) and revisiting various parts of the specimen through iterations. The virtual microscope provides the opportunity to zoom in and out at places they identify as interesting, and it offers a multimodal context which makes it possible to engage in diagnostic reasoning and coordinate perspectives, and, eventually, they reach a conclusion that there are dead cells in the tissue sample (i.e. signs of necrosis which is a conclusion of obvious medical relevance). Owing to the multimodality, joint attention and a shared knowledge base, the problem-solving moves forward by using different resources: verbal language, mouse and cursor movements, fingers and hands. The non-verbal elements add to the meaning-making and the progression of the dialogue, and they are important parts of the epistemic practices, since they appear in a shared communicative space and are interpreted alongside the other elements of the communicative practices. As the authors point out, "virtual microscopy not only seems to facilitate all of these activities" of knowing and mutual understanding, rather "it is a constitutive element of such activities." (p. 516). In this case, not even an inspection of a live tissue specimen would support the same breadth of activities and epistemic practices as the virtual microscope does, although examining such samples, most likely, would offer other important learning experiences.

But, what is also interesting in this case is that the intense problem-solving that Pete and John engage in presuppose basic medical knowledge from a range of fields. Using the tool for diagnostic work builds on an ability to make distinctions (for instance identifying cells, symptoms of necrosis etc.) derived from pathology and other fields of medicine. Such basic knowledge is not accessible through the virtual microscope as a stand-alone device, rather it is a prerequisite for being able to use it for simulated, diagnostic work (Lehtinen et al., 2020).

Learning in a Designed World: Epilogue

The basic assumption of my argument is that human cognition is embedded in a material world that is largely manufactured and increasingly agentic. Thus, our "access points" (Giddens, 2002) to knowing do not reside in our brains or perceptual systems alone, but rather rely on collaboration with symbolic technologies that have emerged over time and that are increasingly specialized and powerful. The position we are currently in as analysts interested in learning is nicely summarized by Markauskaite and Goodyear (2017, p. 133) when pointing out that people

> learn using conceptual and material tools in the same environment. The content of the mind, the shape of mental resources, in broad terms is the result of active engagement and sense-making within a rich and complex culturally configured material and social world.

This feature of what is specifically human about learning has been illustrated in the empirical studies that I have summarized. In all three cases, the very phenomena of knowing and learning are dependent on the presence of symbolic technologies mediating the world in specific ways and in accordance with the interests of particular professions acting in the same environment as is pointed out in the quote. In clinical practices, nodules can be detected only in the presence of imaging techniques and professionals with relevant backgrounds both in the medical field generally and in the use of the specific technology. The two elements are necessary for the phenomenon to appear. Exposure to new symbolic technology in this area triggers professional learning and knowing by presenting challenges that put participants in situations where they have to revise and adjust their understandings to accommodate to specific features of a technology. Their basic medical knowing makes it possible for them to specify what they see and to increase their insights into how one particular technology (that they are about to use) functions in comparison to another (that their knowing is adapted to). But, again, learning has to be understood as an emergent quality of the tensions and disruptions introduced by a new technology and that have to be resolved for the diagnostic work to go on.

Instructing newcomers about how to appropriate the specific skill of seeing a pleural line on an X-ray implied shaping their capacities to make sense of a highly ambiguous image. Disambiguation in this case was achieved by the instructor urging the newcomers to be active (moving closer, focusing) and by invoking a set of concrete scaffolding strategies, such as zooming, rotating and using everyday language to help participants understand what they were supposed to see and how it could be detected in the midst of an image rich in details. The participants in this study were facing a challenge that Dewey (1989) refers to as a "problematic situation" that has to be resolved through "inquiry of a type in which existing descriptions of events are accepted only as tentative and preliminary, so that new descriptions of the aspects and phases of events, whether in widened or narrow form, may freely be made at any and all stages of inquiry" (p. 113). What during the instructions was presented through tentative scaffolds such as a "white line" or a "belt" could be respecified as an indication of a specific and dangerous medical condition, the pleural line. In this case, however, the newcomers did not possess the

medical knowledge to contextualize the meaning of the pleural line beyond what was said during the session, but they were able to identify it (even in some difficult cases) when supported by instructions and a mediating technology during a session of relatively short duration.

In the third case of two collaborating medical students investigating a haemorrhagic and necrotic gallbladder, the symbolic technology operates as a shared tool for problem-solving. In fact, the technology is provocative in the sense that sharing a visual field and having a task to perform elicit interaction. The participants move around the specimen, zoom in and zoom out, make circular movements with the mouse and cursor, and continuously coordinate their understandings without necessarily saying very much. Their expressions are mostly indexical and rely on direct and indirect reference to the shared visual space. The symbolic technology is conducive to cognitive coordination, and, at the same time, it is seamlessly integrated into their meaning-making of trying to establish the status of the gallbladder. In this sense, their reasoning is contingent both on their medical knowledge in pathology (and other fields), and on their ability to discern how phenomena (cells, necrosis) appear in the virtual microscope. The learning that takes place seems to be more of a confirmation of the relevance of concepts and conditions that they are familiar with and that apply to the situation.

Accepting this hybrid nature of the human mind, and the hybrid nature of our activities, the implication at the level of theorizing is that the unit of analysis (Säljö, 2009) for understanding the development of knowing and epistemic practices in our time must include this intimate coordination with symbolic technologies (and with other people) in situated practices. The mind is turned outwards when we search for knowledge and information relevant to a difficult task. The technologies serve as "cognitive amplifiers" in Nickerson's terminology, but more than so, they provide access points to knowing and contexts for learning that would hardly exist without them. When technologies introduce disruptions in established modes of working of the kind illustrated in the first and second case, they will trigger re-specification in the sense that descriptions of events are considered preliminary until a new description, in Dewey's language, is reached that brings the image under some kind of conceptual control.

We live in a designed world that is in rapid motion in terms of how we think and the epistemic practices we utilize. In a digitized society, learning, at some level, is a feature of many of our daily uses of symbolic technologies, even in relation to those that we are reasonably familiar with. These technologies often have affordances that we have not yet discovered, and they furthermore undergo constant modification that introduces new functions that may be useful. In this sense, the digital technology is restless and calls for learning if the potentials are to be exploited. The pace of these changes by far exceeds what we have seen in the context of earlier symbolic technologies such as writing and other documentary practices, which often remained relatively stable over long periods. But, as has been illustrated in the empirical studies referred to above, the hybridity of our mind makes it possible to adapt to new epistemic practices and increasingly specialized forms of knowing, and there does not seem to be any obvious end to these transformations that we have to attune

to. At one level, the hybridity of our mind is nothing new, it appeared with writing as an instrument of thinking and remembering. The epistemic practices that are relevant, perhaps even necessary, in the context of symbolic technologies that are digital share many features with those that were relevant in the pre-digital society. We still have to read, write and handle information in purposeful ways, but the added capabilities that become available seem to be quite powerful and will no doubt make learning an even more prominent activity in our lives.

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Professor Roger Säljö, University of Gothenburg, Faculty of Education, Sweden.

Roger Säljö, Ph. D., Dr. h. c. mult., specializes in research on learning, interaction and human development in a sociocultural perspective, where he has published extensively. Much of this work is related to issues of how people learn to use cultural tools and how we acquire competences and skills that are foundational to living and working in a socially and technologically complex society. He has been a Finland Distinguished Professor (FiDiPro) at the University of Turku. He is an honorary doctor at the University of Turku and the University of Agder, and honorary professor at the University of Bath, UK. Previously he has been visiting professor at a number of universities, including Universität Konstanz, University of California San Diego (USA), Rijksuniversiteit Utrecht, University of Oslo, Georg-August-Universität Göttingen, University of Agder, and University of Stavanger, He has supervised 52 students to their Ph. D. degrees at six different faculties.

Chapter 5
Researching Lifelong Learning Policy: Concepts and Tools

Henning Salling Olesen

Abstract "Flipping the lens" sets a productive point of departure for discussion of the research strategies in relation to Lifelong Learning policies. Looking at the needs of the learner, it shifts the perspective, at the same time as it widens the horizon to go beyond, but still include formal learning environments. There is a dire need for a critical framing of research, which also reflects practical perspectives. The Lifelong learning agenda was born as a visionary reform idea that should unfold the potential of learning for all and give access to learning resources. Often it falls short of such ambitions and turns out to become a narrow and instrumental tool for economic competition. The ultimate aim of this chapter is to show how theory and practices are interdependent. The chapter traces complex connections between several levels of lifelong learning policy that may at first seem mutually independent. The intention is to see how conceptual frameworks inform the micro level of policy implementation, but also to conceptualize the decisive differences in the resulting development, which depend on practice in the realization of lifelong learning policy.

Keywords Competence assessment · Validation of prior learning · Lifelong learning · Life experience · Identities · Reconfiguration

The research framework, which is indicated in the title of this book and further developed in the introductory chapter, provides a productive point of departure for discussion of the research strategies in relation to Lifelong Learning policies. Flipping the lens, looking at the needs of the learner, shifts the perspective, at the same time as it widens the horizon to go beyond, but still include formal learning environments. There is a dire need for a critical framing of research, which also reflects practical perspectives. The Lifelong learning agenda was born as a visionary reform idea that should unfold the potential of learning for all and give access to learning resources. It may however fall short of such ambitions and turn out to become a narrow and instrumental tool for economic competition. The ultimate aim

H. Salling Olesen (✉)
Department of People and Technology, Roskilde University, Roskilde, Denmark
e-mail: hso@ruc.dk

H. Bound et al. (eds.), *Pedagogies for Future-Oriented Adult Learners*, Lifelong Learning Book Series 27, https://doi.org/10.1007/978-3-030-92867-4_5

of this chapter is to show how theory and practices are interdependent. The chapter traces complex connections between several levels of lifelong learning policy that may at first seem independent. The intention is to see how conceptual frameworks inform the micro level of policy implementation, but also to conceptualize the decisive differences in the resulting development, which depend on practice in the realization of lifelong learning policy.

The Policy Context

The agenda of lifelong learning entails a vision of every individual not only having access to formal and non-formal education and training throughout the lifetime but also making use of all the informal learning, which includes everyday life – in work life, in family and social life, in leisure and cultural activities. This vision has been commonplace in international debate since the 1970'es but it was a relatively general and noncommittal idea overarching extremely different regions of the world, and it was not backed by decisive money and power. From 1990'es it has become integrated in a dominant policy discourse about mobilizing human resources and competences for economic competitiveness. On the one hand it raises the political priority of education and learning, but on the other hand it questions education and training institutions and their ability to meet all the learning goals posed from outside.

From these political tendencies a comprehensive program of learning and not least learning for work can be inferred, not only for education and teaching but also for many areas of everyday life. Thus, a lifelong learning oriented research and policy development needs to address not only education and training, but in principle a multitude of practices relating to work organisation, labour market, community and culture, health, etc. Research into lifelong learning needs to fill those gaps in knowledge, make connections, and critique learning at various levels including the social, economic, and political.

To conceptualize learning in both intentional education/training and in all the other areas where learning may be promoted, new discourses have already emerged in which the concepts of learning and competence play key roles. Education and training are being described in terms of (expected) outcome instead of (teaching or curriculum) input, and results predominantly evaluated against employability. Many educationists see these trends as a new level of economic penetration of society and total subordination of education and human values under an economic rationality. In the context of the political economy discussion whether economic market relations are dis-embedded from social relations and institutions (Polanyi, 1968) the mechanism in this area seems reversed by implementing market concepts and market relations in social institutions.

A critical lifelong learning research must deal with this "re-embedding", exploring and highlighting the contradictions and limitations in this economic agenda for learning and competence development. On the other hand, it must also illuminate

(new) opportunities which arise from the centrality of the human resources and the worker subjectivity in economic processes. The request from business and economy for competence development, and a recognition that subjectivity matters, opens up a new arena for participation and democratic struggle over the directions of learning processes (Salling Olesen, 2013a).

The outline of a political context in this chapter derives from a European perspective. But it seems that the basic constellation of structures and interests apply to most of the western countries and also those countries that by structure and modernization development are similar – including Singapore.

The Systemic Tools for Lifelong Learning Policy

The background papers and the theme "Flipping the lens" present a point of departure for study of learning on many levels, which goes beyond the traditional framework of educational research. It is a timely response to a radical change in the relations between education institutions, governance, and (labour) market. In order to grasp the new relations, we need research that examines learning in relation to the economic dynamics of the labour market and the power relations, which shape and negotiate competing agendas and interests. I will primarily address the career and certification systems, which correspond with the reduced role of institutional education – partly because they are symptomatic effects of the ongoing changes, and partly because I think they can be decisive and strategic keys to progressive social reforms in the implementation of lifelong learning.

In the structural governance (of lifelong learning), two quite new technical tools are assigned roles in the implementation process. One is the development of all-embracing qualification frameworks, which allow for the comparison of qualification across national systems irrespective of whether qualifications are obtained by formal education, non-formal/informal learning activities, or as a side effect of something else. The other one is validation of prior learning or competence assessment that enables recognition of specific (individual) competences within a new environment of recognition. These two tools are functionally connected.

The qualification framework as a policy measure has been quite contested in Europe because it has been seen as a tool for bureaucratic uniforming of education institutions of different countries – in this way becoming part of the central theme of European policy to sustain social, political, and economic coherence of the idea of European Union. From a different, technocratic or reform oriented perspective, these are tools for reforms and deconstruction of privileges embedded in obsolete institutional structures. In some countries it has actually been used as a top-down-governance (Mikulec & Ermenc, 2016).

The other tool which is the competence assessment has existed in a number of variations before it was related to learning policy. In most countries, competence assessment has, under the name of Validation of prior Learning, mainly been a marginal element in the formal education system as a "user-friendly" way of helping

individuals to gain new educational opportunities by enabling non-traditional pathways within traditional systems. Legitimized as an anti-bureaucratic opening of educational resources many institutions have used this tool on their own initiative and on the basis of their recruitment interests (or absence of such interests). But there are also initiatives from business human resource management to develop tools for competence assessment – in service of recruitment, internal personnel planning and training within businesses (Salling Olesen, 2004a).

Generally it is possible to observe two main regimes of recognition; work life competence applied by business and industry, and scholastic assessment of knowledge and intellectual skills applied by the formal education institutions (Salling Olesen, 2014). In countries with a relatively low systemic regulation of training and certification, private initiatives have developed to increase transparency in the labour market. In countries with a high level of public involvement in training and further education – the Scandinavian countries par excellence – this has been less relevant. In countries such as Germany, big companies like multi-national corporations have often developed their own training systems, which are in sync with internal labour markets. Across these differences a problem of transparency and translation emerges.

In the last decade or two, competence assessment at the individual level have been introduced in European countries under slightly different headings – Validation of Prior Learning, Competency Assessment, Recognition of Prior Learning, the Danish "realkompetencevurdering" (an assessment of competencies from all previous experience), the French "Bilan de Compétence", etc. Assessment criteria and procedures are diverse defined by the actors involved and the institutional environment (Alberici & Serreri, 2003; Andersson et al., 2013; Salling Olesen, 2004a). All these initiatives, driven by different interests, are now attracting new attention in the context of lifelong learning policies. Legislative regulations in several countries oblige institutions to offer validation of prior learning for applicants with different educational access and backgrounds, and the European Union has recommended member states to implement validation procedures, and set a roadmap for member states reporting for a joint consultation.

The Concept of Competence and Its Use in Policy

Technical tools such as the qualification framework and competence assessment foregrounded here are means to combine and coordinate different learning processes. But they build on a new conception of the relation between learning and practice, especially work. The core concepts in education – knowledge, skills, attitudes, teaching have been exchanged or rather overruled and embraced by new concepts, procedures, and criteria. Beside *learning* the concept of *competence* stands out as the core of a new thinking. In the following I shall go deeper into that conception.

Originally the concept of competence had a legal meaning related to legitimacy. But the meaning that gained ground from the 1990s combines functionalism and psychology meanings with different emphasis and has been applied in different ways (Gnahs, 2007; Illeris, 2009; Rychen & Salganik, 2001). Nevertheless, there is in practice today a core meaning: competence refers to the abilities of an acting subject to translate knowledge into appropriate action for everyday practical situations, above all in work processes. Competence is specified in the following attributes:

- The ability to act successfully
- In a complex context
- Through the mobilization of psycho-social prerequisites (cognitive and non-cognitive)
- With results related to the requirements of a professional role or personal project

In this understanding, which is representative of the political-economic use of the term (Rychen & Salganik, 2001), competence is in one respect *functional, performance-oriented and pragmatic*, and defined in terms of external social and economic demands that need to be met or fulfilled. It questions previous conceptions of the *application of knowledge*, where knowledge is something one can *possess* and where rational practice can be based on general abstract knowledge being applied in different situations. Item 3 in the list above also includes this application but it has a wider implication: The *mobilization of relevant* knowledge. Practice is concrete, and knowledge must be selected and transformed in order to be applied successfully. Therefore, competence presumes a potentially acting subject who is able to mobilize various prerequisites in a manner relevant to the situation at hand.

In the context of recognition or acknowledgement of one's potential and/or actual performance, the notion of competence is supposed to serve as a "general equivalent" of human capability, replacing the dominant system of diplomas and certificates linked to formal education.

The concept of competence it is not a new canon of knowledge or skills, it is a *capability to handle* among others knowledge and skills. Never the less, the practical application of this concept as a general equivalent between different regimes of recognition (Salling Olesen, 2014) raises some theoretical and practical issues. Here I want to highlight the built-in tension evidenced in the efforts to identify key competencies, i.e. the qualities of the workforce that are vital for the economy and competitiveness.

The ambition has been to provide a basis for the development of indicators of competence development over time and for comparing the levels and states of competence in different countries. In the OECD DeSeCo project (Definition and Selection of Competencies) this analytical task was approached quite ambitiously. The scientific ambition to create clarity and consistency in the definition of key competencies was obviously guided by the pragmatic need to achieve workable indicators. One of the main actors, the psychologist Franz Weinert, referring to the connection between competencies linked to specific practices and key competencies with broad or universal applicability, stated as follows: "such scientific plans have often failed in psychology, however. The underlying multilevel models can be

logically reconstructed, but not validated psychologically. The different degrees of abstraction mean, therefore, a fundamental asymmetry in competence research – high abstraction: intellectually brilliant, pragmatically hopeless; low abstraction: pragmatically useful, intellectually unsatisfactory" (Weinert, 2001, p. 52). To put it simply: The scientific ambition to understand the dynamics of subjectivity must be sacrificed in the pursuit of political objectives.

There are two difficulties involved in the political and economical use, both related to the context in which the concept was conceived and propagated.

One is *reification* or *commodification*, i.e. it is assumed that competencies are immutable properties that can be acquired and possessed. This reification is directly triggered by objectives of measurement and comparison, but also in the thinking of economists regarding the logic of the market (commodification) and capital (accumulation). It seems reasonable to view the definition and description of key competencies as an attempt to dream of a universally flexible workforce in an era where the industrial (Taylorist) division of labour and reduction of the complexity of the employee's operations is outdated.

The mobilizing of "cognitive and non-cognitive" prerequisites has deliberately been included in the above summary definition of competence. Psychological attempts at conceptual delineation revolve around the relationship between cognitive factors and a great many other things that are generally called motivational factors. Within the cognitivistic figure of thought, which has been the starting point, it is the relationship between universality/abstraction and specificity/concreteness that cannot be resolved satisfactorily. This is hardly surprising, since practical problem-solving involves something other than abstract knowledge. Weinert himself also refers to empirical data showing that the solution of difficult problems always requires the involvement of content-specific knowledge and skills (Weinert, 1998, 2001). This finding points to a link between psycho-social dynamics (as in problem-solving) and situatedness (since content-specific knowledge is linked to specific situations). In psychological contribution to the DeSeCo project's initial conceptual process, Weinert emphasizes that competence implies and presupposes, in the fulfilment of a task, a combination of "cognitive *and* (in many cases) motivational, ethical, volitional, and/or social components"(Rychen & Salganik, 2001, p. 62). One can get no closer.

This leads us to the second problem of the prevailing competence discourse, namely that it does not take *the subjective nature of competencies* seriously, or rather sees it as a subordinate factor that contributes to the complexity of specific tasks.

Although the requirements or success criteria for competent practice are externally determined, competent actions are basically subjective processes, based in feelings and interpretations: problem comprehension, mobilization of knowledge, learning, and practising skills in new contexts. Therefore, the concept must relate to the subjective prerequisites and dynamics in competent practice. It must involve a view of competence as a personal, culturally anchored and experience-based ability, located in the competent person's way of interpreting situations and engaging in them, and also as a learning tool. It must enable analyses of slackness and constraints as complexes of rationality and defence mechanisms, and seek to understand the

subjective "productive forces" that may lead to learning and practice development, including the kind of expertise that supports the emotional and cognitive work of detachment and reconfiguration. Let me just mention an example of a competency which most people perform to some extent: Change of perspective. It is a basic aspect of understanding and accepting other people, and it may be developed by the interaction with family, leadership in community etc. In a professional career this capability to relate to clients/patients/users etc. will have to be redefined or enriched by professional knowledge – but still based in personal experience.

I have presented a broader theoretical and diagnostic discussion of these questions in an article (Salling Olesen, 2013a) and the special issue of the Journal in which it appears. That article illuminates the contradictory societal space in which competencies, including their subjective dimensions, are transformed.

Work, Learning and Life Experience

The pragmatic turn implied in the notion of competence turns out to unveil a conceptual void in the understanding of "psycho-social prerequisites" that are not simply cognitive. This raises questions to the process of competence building, i.e. learning. There is obviously not a 1:1 correspondence between the practical process of learning and the practice in which competences are being performed.

I have myself been theorizing learning on the basis of the concept of Everyday life Experience (Salling Olesen, 1989, 2007, 2017). This concept of experience so to say flipped the lens on the theoretical level, raising new types of research questions. Learning must be examined as an aspect of life long experience and identity processes. This theoretical framework also provides a perspective on workplace learning (and learning in internships etc.). Work is one of those activities in everyday life which is most important for identity processes, and hence also a rich potential source for learning. Clearly the subjective handling of the social in everyday life is not a cognitive phenomenon only. Consciousness in practical interaction incorporates all its meanings for the experiencing subject(s), the emotions connected with this situation and with the subject matter of the situation, the perception of one self and of the situation. Learning is activated by and influenced by the emotional involvement, comprising moments of learning as well as moments of defense. We may be particularly interested in the interference between cognitive and emotional aspects of the individual experience building in specific social contexts, f. related to work situations, but we will have to take into consideration the subjective experience of the wider life context. There is already a rich literature on workplace learning in the framework of participation in social practice (Billett & Smith, 2005; Billett, 2001). The notion of experience aligns very much with this literature. I just want to point out a few amendments which provide a different view on learning in certain work situations, but primarily are important for the coupling between the micro workplace context and the wider context of individual careers and the constitution of professional identity and professions as social groups.

Everyday life in work is characterized by collective and habitual routines. Perceptions and cognitive processes are also guided by the social and relational emotions attached to well-known practices, to the situation and to projected expectations within it. In a life situation which is generally flooded with impulses and demands, individual and collective mechanisms of consciousness building preserve the individual from anxieties and ambivalences. When non-routine phenomena, "problems", or new contexts occur they are not only (cognitive) problems to be solved. The very observation and systematization of deviations and novelties is a process of cognitive as well as of emotional and social change of the learner. This change is challenging, it may overload the learner, and in some cases it is particularly threatening, because it activates life historical experiences or emotional relations in an anxiety-provoking way.

The maintenance of a routine is therefore not as passive as the notion seems to suggest, it is most often an active editing of perceptions and knowledge in accordance with possible practices – psychologically a defence mechanism. This form of consciousness or "everyday life consciousness" can be conceptualized with a concept (Altagsbewusstsein) borrowed from Leithäuser and others (Leithäuser, 1976; Leithäuser & Volmerg, 1988). It complements a theory of learning as participation in social practice. The selection and interpretation of perceptions is an active, psychic and cultural acquisition which defines the situation in a practicable way – i.e. through active, partly collective defense mechanisms.

Routine may often mean more than simplification of practice and attention. It means that the subject only pays attention to certain aspects of the interplay between social reality and inner dynamics, and as a result they may not be very sensitive to (all aspects of) social reality. An open, embracing attention to inner as well as outer realities seems to be the emotional precondition for, and sometimes also the outcome of learning. But this may sometimes be influenced by resistance and distorted attention for reasons not immediately related to the work situation. In the conflict preventing mechanisms of defensive action, consciousness building is also 'awareness' of problems, unexpected impulses, alternative social practices, 'un-lived lives' from one's own life history, unsatisfied ambitions, and so on. For these reasons, there is a strong potential for learning in defensive routines, cognitively linked with emotional and practical aspects of the learner's involvement in that situation.

Seeing learning in this way, as an ubiquitous aspect of everyday life experience, means that learning research requires theorizing a relation between subjective agency and identity processes and the social situation of the subject as a whole, with its past and present complexity.

Methodology: Identity Processes and Life History

The increasing ambition to engage everyone in learning has in the first place been translated into schooling, and learning needs have been defined as adaptation to the needs of working life. Governments have mostly been rather slow to recognize the

difficulty of mobilizing learning motivation, and market failure has prevailed in most countries. Traditional social research into education participation has described the misery (of class reproduction) and has given causal explanations for variation (in outcomes and results) by quantitative methods. Very little have been done to understand the subjective dimension – except in negative terms like "resistance". But eventually the actual experience of failing readiness to participate in education and training to the extent fulfilling societal needs has highlighted the necessity to understand workers' learning and subjective engagements as an independent dynamic instead. It has become possible to prioritize a research approach focusing on the learner subjects, learning experiences and career perspectives. In my own case the breakthrough was related to labor market integration measures.

In the last few years, general learning research has developed beyond a psychological and educational framework. Several more or less independent processes in other disciplines or across disciplines have contributed and also redefined the very object of research. These developments have involved several elements of radical rethinking which moves beyond the previous orientations to see learning as an individual acquisition process conditioned by more or less intentional stimulating activities in the form of education and training. First of all, a fundamental constructivist thinking is prevalent: Learning is seen as a constructive activity, which is interactive but neither just mirroring nor determined by the encounter with the phenomena and relations of "the world". Second, the notion of an individual as a coherent subject of learning and knowing is being challenged by different ideas of de-centered social/collective/network subjectivity. Third, learning (and knowing) as an entirely mental phenomenon is being challenged by different ideas of materiality, both on the side of the bodily nature of knowing and learning and in the sense of knowing and learning as social practices.

On this conceptual background my own research has been oscillating between two interrelated strands: (i) contributing to a general theory of adult learning processes and (ii) empirical and practical engagements in work life and work related learning. The interrelationship between these two strands has developed and driven an interest in methodological developments. Those developments sit on the boundaries between humanist and social science approaches to understand learning as a central dimension of the learner subject's life process and identity, but always informed by and related to specific social environments, especially adults' work and career environment.

This forms the background for a methodological development of a Life History approach drawing upon inspirations and practices from (auto)biographical research. Life History approach examines learning as a process related to an individual's life course and his/her subjective experiences situated in specific social contexts, including work life. The significance of gender, class and previous career are also central to this line of enquiry but they have to be reinterpreted as subjective experiences. Likewise, the importance of specific work processes and workplaces had to be analyzed as moments in worker subjects imagining their possible future.

The group I led at Roskilde University conducted a substantial volume of empirical work in different areas of employment, whilst also continuing to revise and hone the technical and conceptual issues of this method (Salling Olesen, 2004b, 2016; Salling Olesen & Weber, 2013).

In the following years, an increasing focus on work identity, or the subjective engagement in the work process by individuals arose from data when studying areas of professional work. In professionalized occupational fields, it was found that the relative strength of worker identification with their occupations was stronger than others, and there were indications of the significance of this occupational subjectivity in relation to concerns about competence in the conduct of these professionals' work. These findings arose through researching the work and sense of self of engineers, medical doctors (GPs), nurses and teachers. In these cases, it was found there were strong interdependence and also tensions between personal life experiences (including gender and class) and the culturally shaped field of professional conduct which imbued by the individual in the process of professional knowledge formation and development of professional habitual practices. So learning in the work process and the learning for a specific professional career seems to be a result of the interaction of relatively different dynamics of the individual life history and of societal and structural changes of the environment of professions' work.

The challenge of understanding subjectivity as a result of life history interaction experiences led to new developments of the life history method. Drawing on social psychology and an "in-depth hermeneutic" procedure with basis in psychoanalytic interpretation procedures applied to cultural symbolic activities, we developed a new concept of subjectivity and a new procedure of interpreting everyday life interactions: i.e. in work and in work-related learning processes. This development enabled us to deal theoretically with the subjectivity of workers' individual engagement in work and also with the subjective involvement of the researcher in the interpretation of learning processes.

I think it is necessary to explain why and how we draw on psychoanalytic insights in the interpretation of subjective experiences. The most important at this time is to emphasize that I draw on psychoanalysis as a framework for interpretation of cultural phenomena – seeing psychic dynamics as produced by societal relations and representing an inner psychic modality of culture, the embodied culture. Emotional and cognitive processes are seen as practically identical or closely interwoven. The individual processing of cultural meaning and societal conditions constitute the subjective experience. Methodically the analyst pays attention to symbolic activity and language use and their relation to lived experience.

This psycho-societal approach has been published as a general methodological approach in social research (Salling Olesen, 2013b, 2016, 2020) – but actually it had a clear focus on understanding the subjectivity of learning, and learning as a general dimension of social relations and interaction.

Theory: The Concept of Experience

The conceptual core which connects the general social theory with the learning dimension, and actually also embraces the role of education and training is the concept of experience.

This concept has many varieties in education, some of which are simplistic cognitive ideas within curricular thinking, others informed by a training strategy assuming that people automatically adapt practices they are experiencing. The concept of experience I would like to advocate is a much wider concept of life experience developed by Theodor W. Adorno and elaborated by Oskar Negt (1999). It is the individual, sensual and embodied version of historical or societal circumstances that this individual has experienced on "eye level" and as a personally involved agent, and on which (s)he has built a world view: "Experience is the process whereby we as human beings, individually and collectively, consciously master reality, and the ever-living understanding of this reality and our relation to it. Experiences in the plural. . .as in everyday language. . . are to be seen as products of this process. . . .Experience is a *subjective* process. . . .[It is] also a *collective* process. . .through a socially structured consciousness. . .finally an *active, critical and creative* process. . ." (Salling Olesen, 1989 p. 8).

The learning theory point is to connect the immediate experience of everyday life with its societal as well as its individual psychic dimensions. For empirical analysis it offers an operational connection between three aspects or modalities of experience. Three relatively independent dynamics are mediated through each other in every agency and learning process:

- everyday life experience,
- life (history) experience, and
- cultivated knowledge.

The consciousness of everyday life is a situated and embodied experience, closely related to the engagement of the individual in specific practices. The situation is structurally embedded in societal history, but it is also influenced by life experience and culturally available semantic schemes, and the way in which they are individually acquired in life experience.

We can analyse empirical material as mediations of these dynamics. It includes the individual experience building throughout *individual life history*, with the interference between cognitive and emotional aspects, which comes in a specific version in every individual. Every individual has a specific emotional and social experience which has sedimented a general view of the world and ways of seeing him/herself. We may understand *identity* processes in terms of this sedimentation and ongoing engagement in the world. Identity is always in flux, indeterminable – it is self definition, but partly contradictory, and always engaging and reconstructing one self.

We can see *knowledge, symbols and norms* as forms of culturally objectified experience. In relation to the development of societal labor we may speak of an industrial experience, or an urban experience, or a female experience of double work. More specifically we can see crafts or professions as collective experiences that have been historically stabilized, and we can even see literacy and mathematical modelling in this perspective. In the context of Singapore, this cultural dimension of the concept of learning appears particularly important. The country has experienced a rapid modernization process, in which an already complex mix of cultural influences have been in the midst of the globalization of capitalism. Needless to say I am not able to detail the significance of this fact. Learning theorized with the concept of experience applied here we open an examination of different levels of learning with different fluidity. Learning is a complex of progressive processes, transforming collective cultural experiences (knowledge, skills and normative directions) into individual experience, constituting individual subjects in doing so, and at the same time changing social practices. The psycho-societal insights and methodology was developed to enable the understanding of the complex interrelation between the *subjective dynamic* of experience and identity, and societal changes.

To avoid the usual dichotomy between the individual and the soci(et)al level of analysis is a key challenge for learning theory. Societal relations play a role not only "from the outside", shaping the social situation, but also "from the inside", by the societal production of the learner subject throughout life history.

With the framework of lifelong learning this theoretical approach has gained new momentum in relation to education. But actually it has a much broader implication for the understanding of the societal shaping of the individual subject.

Beside the academic implications of this new perspective I think that the theorizing of learning may be a key to discussions about agency and democracy in a globalizing capitalism, and the role of knowledge in a late modern society with much broader resonance to social theory, politics and epistemology than can be discussed here (Leledakis, 1995; Salling Olesen, 2002).

Policy as Emergence: Developing Methods for Recognition of Prior Learning/Assessment of Competence

For the realization of a lifelong learning policy it seems essential to establish structures and procedures which can support individual competence development and identity processes and mediate between the specificity of subjective learning and a legal and systemic dimension. On the background what has been said about the subjective dimension of competences and the reconfiguration of competencies a substantial challenge of theoretical as well as practical nature remains (Salling Olesen, 2001, 2014).

I think it is clear that there is no logical quick-fix – if we want to create a lifelong learning which is not limited to employability and competitiveness it will have to be a multitude of learners' individual and collective identity development as they discover and embrace new opportunities.

A small example may illuminate the nature of these processes and the role research may play in them:

A couple of Danish doctoral research projects addresses a mechanism of individual competence assessment (IKV) of applicants to professional bachelor education within a number of areas (teacher, preschool pedagogue, nursing, physiotherapy, construction technician). The standard gateway to professional bachelor education now is an A-level and the applicants who benefit from the IKV-access are people who have a lower formal school education and then some kind of non-academic professional education (examples are presented in Salling Olesen, 2020). In these projects the researchers have adopted a qualitative approach to understand the life historical dynamics of competence development. They do life history interviews with a sample of students who have applied for and gained access to these professional educations on non-traditional background. The analysis seeks to understand on the basis of these individual cases to which extent and how they have been able to reconfigure knowledge and skills between the life situations they have been engaged in, into the present situation of the education program and the future of their coming professions. The encounter between specific learner life experiences, their individual anticipation of a professional domain, and ongoing societal debate of that professional domain is the wider context. Apart from seeing knowledge and skills as situated in social practices, that are widely different, they are also analysed within a subjective process, which involves a change of life perspective and preliminary identification with the situation as a student and the prospects of the particular profession chosen. Their individual learning and reconfiguration of experiences may contribute to the education program as well as the professional community. The hope is that such exemplary interpretations can illuminate the intellectual and emotional reconfigurations, which take place in career shifts and inspire both potential learners and those who can facilitate their process.

Summarizing

The argument of this article is to point out the interplay between basic concepts of learning and technical tools of lifelong learning policy. I shall now briefly summarize the components and logics of this argument. Initially I remind about the policy of lifelong learning, which has changed the landscape of education and learning in a way, which is still contested. I highlight the contradictory nature of this development by examining some of the tools for implementation of lifelong learning policy, and their mutual interdependence with the new conceptual framework that has emerged. I focus on the implementation tools Qualification Frameworks and Competence assessment, both related to the operational challenge of being able to integrate

learning in formal systems and informal learning based in everyday life. They are both based on a concept of competence as a notion of (potential and intended) outcome of learning. I point out the innovative perspective on learning of this concept but also problematize the prevailing use of it in policy making: First because it is used in a commodifying way, second because the subjective nature of competence is disregarded. As an alternative foundation for a concept of competence I outline an idea of competence and competence building which is based in people's life experience, and take into consideration cognitive as well as emotional and relational aspects of human life practice. For developing research that can provide such an understanding I propose a life history research methodology, and a theoretical underpinning of the concept of experience, setting the scene for a comprehensive theory of learning in everyday life as well as within institutional education and training. With a view to the operational challenge of integrating formal and informal learning I briefly sketch the use of life history method to understand the reconfigurations of life experiences across professional careers.

Acknowledgement I would like to thank the reviewers of this article for their valuable comments and assistance for clarification of the text.

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Professor Henning Salling Olesen, Roskilde University, Department of People and Technology, Denmark

Dr. h.c. Former president for European Society for Research in the Education of Adults (ESREA) and coeditor for RELA. Advisory prof East China Normal University, Shanghai. Research areas: lifelong learning policies and practice, learning in and for work, professions and learning careers, life history approach and psycho-societal theory and method.

Recent publications:

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https://dx.doi.org/10.31892/rbpab2525-426X.2020.v5.n13. pp 105–122

Chapter 6
Future of Work, Transitions, and Future-Oriented Learning

Arthur Chia

> *"Education in the past took many forms and proved able to adjust itself to changing circumstances, setting itself new goals and designing new strategies. But let me repeat – the present change is not like the past changes. At no turning-points of human history did educators face a challenge strictly comparable to the one the contemporary watershed presents. Simply, we have not been in such a situation ever before. The art of living in a world over-saturated with information has still to be learned. And so has the even more difficult art of grooming humans for such a living"*
> *– Zygmunt Bauman (2009, p. 163).*

Abstract This chapter reflects critically on the future of work and offers a conceptualisation of future-oriented learning. It offers a social economy perspective of work, and imagines a more equitable future where the needs and interests of working people are prioritised in learning. It highlights the condition of constant flux through the explication of "transition", and makes an argument for learning which is empowering, enabling of critical engagement, and contributes to democratic conditions and participation in work and life. Therefore, future oriented learning is proposed as a means of enhancing workers' ownership and control of their work, labour, and skills. It can be operationalised in practice through the "six principles of learning design" engendering workers' and learners' agency, mutual exchange and interaction, participation, and engagement in work.

Keywords Future of work · Transition · Future-oriented learning · Six principles of learning design

A. Chia (✉)
Institute for Adult Learning, Singapore University of Social Sciences, Singapore, Singapore
e-mail: Arthur_Chia@ial.edu.sg

H. Bound et al. (eds.), *Pedagogies for Future-Oriented Adult Learners*, Lifelong Learning Book Series 27, https://doi.org/10.1007/978-3-030-92867-4_6

Introduction

In this chapter, I explore the theoretical underpinnings of future of work and consider the implications for learning. The world of uncertainty demands learners to be adaptable and flexible, which turns learning into "an art of living" (Bauman, 2009). The relationship between future of work and learning is specified in what I call here "future-oriented learning". To make sense of this relationship or connection entails flipping the lens to reflect on the purposes, nature, and social conditions of learning as digitalisation and technological advancements, rising trade wars and regional socio-political instabilities, and the persistent problem of inequality present unprecedented challenges but also opportunities, to think critically about learning embedded in work related, lifelong, and adult learning. The future of work entails a new situation of uncertainty that calls into critical questioning about how the future is (to be) understood, alternative futures (economy, work and workplaces), and the role and nature of learning in the re-imagining of futures.

This chapter aims to do two things: first, it provides a theoretical response to this new situation through a social and philosophical critique of future of work, and a conceptualisation of future-oriented learning. Second, it illustrates the "six principles of learning design" (Bound & Chia, 2019) as a practice of future-oriented learning. By combining the tasks of critique of future of work, and fleshing-out of future-oriented learning, this chapter flips the lens from which to see and do learning as a transformational, agentic, and strategic mechanism for and feature of democratic work and living.

Future-oriented learning enables the "social economy" defined as, "an alternative way of directly organizing economic activity that is distinct from capitalist market production, state organized production, and household production. Its hallmark is production organized by collectivities directly to satisfy human needs not subject to the discipline of profit-maximization or state-technocratic rationality" (Wright, 2010, p. 90). Social economy enterprises institute democratic decision-making processes that are based on principles of (workers') "participation, empowerment, and individual and collective responsibility" (Neamtan, 2005 in Wright, 2010, p. 136).

Examples of (successful) social economy enterprises include Quebec's producer-cooperatives in the child- and elder-care sectors (Wright, 2010, pp. 144–151), and Mondragón Cooperative Corporation (MCC[1]) – a group of workers owned cooperative enterprises in the Basque region of Spain where "worker-owners of the cooperatives retain meaningful democratic control over the broad strategies of the individual firms and the larger corporation, and in this respect function very differently from capitalist corporations" (Wright, 2010, p. 171). Social economy models such as Quebec and MCC rely on people's willingness to participate and engage with one another, and the learning capacity to handle new and unexpected challenges.

[1] See also Kasmir, S. (2016). The Mondragon Cooperatives: Successes and Challenges. In Global Dialogue: Magazine of the International Sociological Association, 6(1): http://globaldialogue.isa-sociology.org/the-mondragon-cooperatives-successes-and-challenges/ (accessed 8 May 2020).

Future-Oriented Learning: An Approach

Many education scholars have tried to address what future-oriented learning means, and what it entails. For example, Lee Wing On discussed the twenty-first century as a "new time" of social and economic transformation towards knowledge economy, knowledge work, and the inevitability of technological advancement, which require new "twenty-first century skills and competencies" including "critical thinking, problem solving, and learning to learn" (Lee, 2014, p. 4). The twenty-first century skills paradigm intensifies the demand for people to continuously learn what is needed for survival (Lee, 2014, p. 12). But this leads to "individualisation" or the heightened sense of self responsibility that people have about their own lives which induces "feelings of fear, anxiety and uncertainty" (Davis, 2008, p. 1238–1239). It can be argued further that the twenty-first century skills paradigm and discourse tend to essentialise, decontextualize, and disembody "skills" from their institutional settings, labour market realities, and work-life conditions which are rapidly changing. The twenty-first century skills paradigm also has nothing to say about the rising precarity of well-educated and skilled workers - for example adjunct labour in universities (Hsu, 2019), which point to the fact that there are systemic and administrative problems that are unravelling social and political institutions, the economy, and labour markets.

Without a critical grasp of melting structures, shifting boundaries, the changing quality, state, and condition of work and life, well-meaning education scholars and futurist pundits are perhaps unlikely to capture the nuances and implications of real social problems which they purport to solve through learning. Here, learning theories including transformative learning, workplace learning or informal learning, and socio-cultural learning have also not been able to engage critically enough with future (of work) thinking and scholarship. Transformative learning theories have a deterministic emphasis and tend to overlook in-depth theoretical analysis (Taylor & Cranton, 2013); workplace learning or informal learning theories use "the lens of work itself – i.e., the nature of the organization and the job as well as the workplace context" (Marsick et al., 2016) rather than critique work and its plausible futures to understand learning (practices), and socio-cultural theories of learning, which draw from Vygotsky's scholarship emphasise the processes of "internalisation" and "externalisation" in the shaping of individuals (Verenika, 2003), are embedded in social contexts that privilege the interactive and normativizing effects of communication groups rather than the malleability of these groups. All these theories are conceived with "hard" conceptual and physical boundaries about who or what learners are, where learning occurs (in classroom, workshop, at dinner table etc.), what learning entails and where it would lead to, in worlds already pre-figured. Yet, the future of work suspends any sense of coherence and stability about such (future) worlds upon which these learning theories have been built on.

The connections between future of work, social change, and learning are complex and intertwined, and they need to be better understood. Hence, I situate future-oriented learning in a context where futures are less knowable or certain. I highlight

but also interrogate the increasingly instrumental and utilitarian nature of learning and knowledge, which lean towards human capital approaches and theories that conceive learning and knowledge narrowly, and reinforce learning as an activity separate from the material basis of work and life, the political economics of labour, human subjectivity and experiences. I reject this notion of learning and knowledge which is detrimental to human development and flourishing as it attempts to simplify all aspects of the human and social being to the qualities of a commodity, and reduce learning into a mechanistic process.

There is a need for a social theory (of learning) that links the critical analysis of work and life, and imaginaries of a more equitable future. It must conceptualise the social and political basis of learning in a way that reveals the assumptions and raises questions about the prevailing logic of work, life, and imagined futures. For example, by combining a critique of capital and conception of economic democracy, Henning S. Olesen (2015) raises the possibility of (re)imagining modern work and life systems and processes which focus on the needs and interests of working people. He articulates the role of learning that enable workers' adaptive or "self-regulative" capabilities to develop the necessary skills for their work, to self-organise and safeguard their shared interests, and to extend their knowledge (Olesen, 2015, p. 545). Likewise, I begin by unpacking the notion of "future of work" and propose "transition" to denote an alternative idea of the future not as a given but pregnant with new and yet-to-be imagined possibilities. Then in the following section, I use the "six principles of learning design" (Bound & Chia, 2019) to flesh-out the idea of future-oriented learning as *praxis* that creates a learning environment or conditions of democratic equality.

Unpacking Future of Work and Transition

Future of work scholars typically examine the implications of globalisation, technology, new models of business and practices, and education on work, and they consider the impacts on national and international communities as well as individuals and organisations. Some of the issues that have emerged from research and conversations about future of work include employment options and opportunities, skills demand and need, future workplace organisation, and adoption of new technologies. These issues then set the agenda for adult and lifelong learning in many countries where national and international organisations like UNESCO, European Commission, World Economic Forum etc. are concerned with preparing workers for a future when employment and income become less stable, secure, or certain.

There is a shared narrative or common theme about the future (of work): as one that is created and therefore malleable rather than pre-determined; of new technologies as a key to human progress that will present challenges but also opportunities for greater human flourishing, and of a digital economy and society that will spur new requirements for human capabilities (Reynolds et al., 2018). However, this is often accompanied by a silence around questions about who are the ones imagining

the futures, and how such futures which have been imagined reflect particular social lives, social orders, priorities and interests that shape actions and policies (Jasanoff & Kim, 2013); the extent of human responsibility, and the values of freedom from oppression (Evans, 2009, p. 248), equality etc. that may have come under threat. The narrative tends to over-simplify and perhaps obscure the quality and conditions of life, work, and learning in these futures, which sociological scholars and researchers have evocatively described as a "transition" from relatively stable or "solid modernity to a more liquid form of social life" that demands flexibility (Bauman, 2000, 2009; Beck, 2000).

The concept of transition disrupts the linearity of developmental thinking about futures, and destabilises "fixed" or taken-for-granted ideas about what the future will be like and how people will live and work in those futures. Transitions may be caused by environmental, social, economic and political upheavals, and they have prompted scholars to reflect critically about the nature of humanity and/or purposes of life (Thomassen, 2009). Ulrich Beck for example claims that contemporary society is at the cusp of a transition between "industrial society" and "risk society" where "modern society has become a risk society in the sense that it is increasingly occupied with debating, preventing and managing risks that it itself has produced" (Komlik, 2015). Zygmunt Bauman theorises transitions as a state of social existence or "liquid modernity", highlighting globalisation and individualisation as the twin processes of social change. Liquid modernity characterises the (new) fears, anxieties and uncertainties that individuals find themselves dealing with on their own, and their life projects which revolve around identity as a *task* of self-building (Palese, 2013, p. 1), and consumption (Bauman, 2005).

Transitions are also explained by ethnographic studies (of rituals) as a "liminal phase" (Turner, 1969) characterised by a state of ambiguity. Liminal subjects evade structure i.e. "they are betwixt and between the positions assigned and arrayed by law, custom, convention, and ceremonial" (Turner, 1969, p. 359). Suspended in the in-between spaces of social systems, liminal subjects prepare themselves or are being prepared for their next phase or station in life. Victor Turner and his followers examine transitions in terms of the deconstruction and reconstruction of social subjects and their identities that reinforce and reproduce the larger existing social order. They help us to see transitions as a social process that is essential to the reproduction of society. Whereas Beck and Bauman highlight the challenge in defining or trying to grasp what "society" is or will be like in the future.

The idea of transition suspends any preconceived or pre-determined notions about society and its conceptualisation as a perpetual self-correcting entity (like the market). It begs the question of how to live in the times and conditions of change caused by technological development and/or unpredictable events like COVID-19. Among other things, scientists fighting COVID-19 plead for greater cooperation amongst and between local, national, and global public health communities, and inter-sectoral collaborations that "involve urban planners, demographers, economists, environmentalists, sociologists and community-based groups, in addition to animal health, public health and infectious disease experts" (Gubler, 2020).

In historical moments of change, Beck optimistically sees opportunities for international cooperation and a "cosmopolitan turn" in the social sciences. Bauman's framing of transition as an interregnum or "a time-span of yet unknown length, stretching between a social setting which has run its course and another, as yet under-defined and most certainly under-determined, we expect or suspect will replace it" (Bauman, 2014) is an invitation to consider (and create) future worlds and possibilities. Together, they provide a basis for new ways of thinking about learning in relation to societal futures, particularly a future-oriented learning that emphasises "democratic equality" (Anderson, 1999) based on mutual exchange that require the voice and recognition of learners, exercised in the course and practice of learning whether in classrooms or through work and in the workplace at the local, national, and global levels.

Many scholars, researchers and seers or futurists have prospected, deliberated, and debated about what the future economy and society will be, and what sort of interventions in terms of educational policies, systems, institutions and practices are required to create those futures. There are three broad approaches to and visions of what these futures look like in terms of work and employment opportunities: labour scarcity, job scarcity, and end of work (Brown et al., 2018).

Notwithstanding the optimistic-pessimistic and/or utopian-dystopian lens through which technology, its deployment, and relationship with labour market processes are viewed, and the lack of consensus regarding the future, transition appears to be a common feature in these different narratives in at least three ways.

First, transition signifies the dissolution of "old" social orders and rise of new ones enabled or exacerbated by technologies. It engenders social and culture change, which Bauman describes as "the powerful flow from solid modernity to liquid modernity – presaged by and presaging further social changes hitherto unknown in scope and speed – is creating new and unprecedented conditions in which individuals must pursue their fragmentary goals" (Bauman, 2009, p. 157). Bauman's use of liquid or liquidity as a metaphor is highly instructional because it invokes thinking about transition as a break (or disruption) from normality, and/or a "betwixt and between" (Turner, 1969) situation in both time and space, and as a permanent condition of our modern times that makes ever greater demands on people to be flexible and adaptable:

> "Liquid life is a kind of life that tends to be lived in a liquid modern society. . .a society in which the conditions under which its members act change faster than it takes the ways of acting to consolidate into habits and routines. . .liquid life, just like liquid modern society, cannot keep its shape or stay on course for long" (Bauman, 2005, p. 1).

The properties of shapelessness and constant flux in liquid modernity characterise the conditions of contemporary life (including work). Thus, liquid modernity represents a time of restlessness (rather than permanence) and even disarray that "saturates individual lives with feelings of fear, anxiety, and uncertainty, and which men and women are solely responsible for managing in their everyday lives" (Davis, 2008, p. 1238–1239).

Second, as old structures, relationships, and identities "dissolve" and give rise to new ones, the processes of self-making and self-development in response to "flexicurity[2]" i.e. the emergence of "flexibility" in multiple dimensions including labour markets, work organisations (in the form of "flexible firm"), employment contracts and/or "precarity" indicating a state of being in "an existential angst of living a life of ambient insecurity, strongly suggestive of the breakdown of stable social bonds and identities, and the disappearance of old reliances" (ARI, 2017[3]), require new modes of being and strategies (of self) to work, learn, and live.

Third, in liquid modernity the "individual" becomes the main focus, pre-occupation and site of life-building/making projects. As old social structures dissolve, the "individual" emerges (in importance) when social action is increasingly relegated to and mediated by individuals. Bauman and his followers argue that individuals respond by changing or refashioning themselves in the mode of commodity to "suit" the contemporary world, and calculate their worth on the basis of "usefulness".

These three broad strands of transition – as changing conditions of work, processes and strategies of self-making, and rising individualisation, speak collectively to the disparate narratives of the future of work. In the following section, I reflect on transition to consider the implications for learning in a time of social and cultural change. Transition as a feature of contemporary/modern life invites thinking about and the practice of learning as an "art of living. . .in a world that has yet to be learned" (Bauman, 2009, p. 157).

Implications for Learning

Both Beck and Bauman's evocative prognosis of changing work/life/futures frame thinking about social change as transitions at the level of experience, mode of being, and social and cultural conditions. They invite us to think critically about the interconnection between learning and a world in transition, and the purposes of learning. It is only by thinking through these issues that we will be able to see how people can be better supported and enabled to navigate liquid times through learning.

Liquid times engender particular attitudes and ideas about learning and knowledge. Knowledge may no longer be understood as something that is accumulated or possessed but to be used for and in whatever the changing situation or circumstance may require. The short-term "one-off" use or a use-and-discard attitude deeply

[2] "Flexicurity" is a European Commission's policy response to changing national labour markets in European member countries. It is "an integrated strategy for enhancing, at the same time, flexibility and security in the labour market. It attempts to reconcile employers' need for a flexible workforce with workers' need for security – confidence that they will not face long periods of unemployment" (https://ec.europa.eu/social/main.jsp?catId=102&langId=en)

[3] "Living in an age of precarity: living and lives in 21st century Asia". An Asia Research Institute (ARI), NUS conference from 27 to 28 Feb 2017.

implies disposability of knowledge, and puts a time-stamp or shelf-life on learning. This also suggests that learning is valued according to its (economic) usefulness rather than its worth in truth, meaningfulness, and/or other values. This lends learning strongly towards attainment of tangible rewards and/or outcomes like certificates, expected jobs and salaries, short-term solutions and specific performances over the formation of qualities like professional identity and/or character.

The strong instrumental and utilitarian bias for learning and knowledge, whether to secure and maintain jobs, advance and sustain careers or just to get things done lean towards human capital approaches to learning and knowledge. The implication is that speed – to acquire knowledge and skills quickly enough, in just the right "amount", and at the right time in order to get the job done, is a penultimate goal/objective of such learning. The practices of teaching and learning oriented towards utilitarian or instrumental purposes, facilitated by the fragmentation of learning as it is repackaged into modules and/or "bite-sized learning", "just-in-time learning" etc. delivered via the internet and social media, and the worship of convenience over everything else perhaps goes against the grain of learning as self-development, growth and enrichment, and self-sustaining over time. Here, knowledge is disembodied and reduced to a kind of depreciating asset rather than a vital ingredient or "live culture" for/of learning. The human capital premise of knowledge (as asset or commodity) is limiting as knowledge is a social phenomenon embedded in and embodying meanings, histories, human activities, power, and language with profound social, political and psychological ramifications (Schatzki 2001, p. 12–13).

The paradigm of "stability" advanced by social and cultural (structural) theories has shifted or given way to one of "flexibility" supported by theories of agency, networks etc. Learning, previously theorised as cognitive frames (of mind), and/or (re)production of value systems may even be considered an obstacle to the world of constant change. Learning has also reached a point whereby "unlearning" – a process of abandoning and discarding settled habits and by their implication relations, values, and long-term commitments, has become a prerequisite to learning new things or as Bauman, quoting Soren Kierkegaard puts it succinctly, "to finish quickly and start from the beginning" (Bauman, 2009, p. 161).

Learning in liquid times privilege identity projects. Workplace learning scholars have highlighted that for certain professionals like freelance adult educators, learning to be and/or become are key to gaining and sustaining paid work (Rushbrook et al., 2014). They propose an understanding of learning as "an often invisible and constant process involving abstract and tacit knowledge (that) moves away from the 'competence theoretical approach' where learning is transmitting competences. . .largely through formal training" (Rushbrook et al., 2014, p. 421–422). Here, learning is observed to be effected through day-to-day as well as past work experiences, in various interactions with colleagues and clients, and personal reflection across different work situations, activities, and communication channels. They also suggest that learning is shaped by factors like personal motivation, operating in different and diverse settings, and the constant need to change, adapt, and improve. Learning to be/become plumes the self as a resource, requiring "counsellors who show them (learners) how to walk, rather than teachers who make sure that only one road, and

that already crowded, is taken. The counsellors they want. . .should (and would) help them to dig into the depth of their character and personality, where the rich deposits of precious ore are presumed to lie clamouring for excavation" (Bauman, 2009, p. 162). The emergence of learning as identity forming where "every experience can be viewed as a learning opportunity, and the individual can embrace change as an aspect of their professional practice" (Rushbrook et al., 2014, p. 423) corresponds to the rise of "individual employability" or taking individual responsibilities for social action like labour market processes when workers face greater insecurity and risks, and are forced to focus on seeking and maintaining increasingly fragmented work and employment opportunities (Grint & Nixon, 2015, p. 299). Taken to an extreme, individual employability means that workers have to think about themselves as "bundles of commodifiable skills" (Urciuoli, 2008) which enable the monetisation of some aspects of their personhood in the labour market. Such intense commodification and alienating effects of the market can deaden people's creativity, sap their willingness to engage or participate meaningfully, and deplete their learning capacity to deal with unexpected challenges ahead. Learning in these contexts tend to be disembodied and mechanical.

Thus, education scholars have argued for the importance of character education, citizenship education, and values education in an attempt to restore human agency and meet the challenges of these times (Lee, 2012). They recognise the need for an active citizenry who could participate meaningfully in the public sphere, and they support an education that develops people's ability to exercise their civic duties.[4] Likewise, they also see a parallel and similar need for an active and engaged workforce who could participate meaningfully in creating their work and futures, and could take control of their working lives.

Operationalising future-oriented learning entails "creating the possibilities for the production or construction of knowledge" (Freire, 1998, p. 10). By adopting a pedagogy of empowerment, critical engagement and co-creation, which believes that meaningful learning and/or learning that is self-driven and owned is best situated in conditions of democratic equality, future-oriented learning could potentially transform social and economic structures instead of integrating people into "structures of oppression" (Freire, 2005, p. 74). A future-oriented learning based on an ethics of mutual respect, recognition, and responsibility for one another builds a sense of equality, which ensures freedom for all to speak, do, and create. This entails "an ethics of subjectivity (that) focuses on the ways in which the subject appears as someone through responsible response to what and who is other. A politics of emancipation (that) focuses on the moment where the subject speaks in a way that is neither repetition nor self-affirmation but bring something new into the world. An aesthetics of freedom (that) highlights the mode in which common sense is transformed by assuming equality in a situation of inequality" (Biesta & Safstrom, 2011, p. 542).

[4]However, scholars (for example Lee, 2012) who propose or support values, character and citizenship education tend to emphasise and instrumentalise national and cultural "differences" in their responses to the enculturating forces of globalisation.

A Programme for Future-Oriented Learning

In this section, I attempt to operationalise future-oriented learning by suggesting three propositions for curriculum design and development:

First, empowering people to become active learners who can exercise control and mastery over their work, lives, and futures. It means to enable people to make informed professional as well as ethical judgment, express their thoughts, hear others and be heard themselves, relate to others and their environment, and co-develop as well as apply knowledge and skills in order to expand and deepen their engagement in learning, work, and life as critical participants.

Second, the autonomy of learners is key in order for them to be engaged in continuous learning, learning for the longer term, and learning for the unknown. To advance autonomy or individual agency means to enable learners to engage, negotiate, and shape the practices of learning based on mutual responsibility and interdependence between learners and other stakeholders.

Third, future-oriented learning as a set of practices can be broadly defined in terms of "a temporally evolving, open-ended set of doings and sayings (linked by) practical understandings, rules, teleoaffective structures and general understandings" (Schatzki, 2002, p. 87). Future-oriented learning should enable people to interpret, reflect, and create or sustain dialogues with one another, and with their social environment. As a practice, future-oriented learning could enhance the transparency around how work is produced or sustained within particular professions and/or institutional contexts, and how people can participate meaningfully in these contexts as informed subjects and social agents.

The "six principles of learning design" (Bound & Chia, 2019) – a practitioner's guide for adult educators in designing and facilitation of learning, is a concrete and practical demonstration of the three propositions for future-oriented learning that have been articulated thus far. The practitioner's guide (re)directs our analytical gaze and framing of action towards being/becoming or self-development in classrooms and/or at workplaces/spaces as a social sphere where learning is constituted and experienced by a multitude of (social) actors rather than from a position of management organising and controlling of learning which compel students/learners towards either compliance or resistance.

The "six principles of learning design" engenders learning through mutual exchange, agency, and a language of participation and engagement. This entails:

- The use of vocabulary such as growth, develop, learning is a process;
- The belief that learners make their own sense or meaning, and that learning is a social phenomenon;
- Holistic practices such as design of learning so that learners are actively engaged, and able to make decisions, and create critical and exploratory dialogues;
- Learners to be self-directed where developing these capabilities are incorporated into the learning design and facilitation;

- Learning environments that create multiple, complex experiences for learners where they need to make sense and meaning of their interaction with one another, the materials and tools, and various contexts (Table 6.1).

The "six principles" proposes learning as a practice that is democratic, integrated, and committed to human flourishing. It is concerned with the realization of individual capabilities, and the institutional environment or the "space" in which learning occurs.

Here, learning is (re)defined as participation, not as acquisition and reproduction of knowledge. Learning is understood as learners' engagement (in learning) with all their senses, wherever possible. Perceptions and feelings, and sensorial values are important aspects of learning. The six principles go beyond deterministic, functional and cognitive theories of learning. It denotes learners' ability to negotiate the things that matters to them, and incorporate into "institutional practices as they take forward their intentions" (Edwards ibid). Learning can be designed to inculcate mutual trust and engagement, and/or to build community. Learning needs to be open to a state of emergence or as George Herbert Mead (2002) puts it – with a sense of continuous movement, and evolution into new states rather than reproduce the status quo or current state.

The ability to speak freely and openly can be enabled by spaces or an environment of safety and respect for one another. Studies have shown that being immersed in a particular kind of learning environment profoundly structures the learners' "social knowledge, worldviews and moral principles that denote membership and status in a trade" (Marchand, 2008, p. 246).

The six principles enable and are enabled by an environment of democratic equality that facilitates the building and sustaining of relationships supported by "relational capabilities" (Edwards, in this volume). Thus, learning need not necessarily be an individualistic performance-enhancing endeavour but it can be an other-oriented and community-making political practice. The latter entails learners to "listen to what matters to others and make their own interpretations and intentions clear; and construct identities, which involve an ability to relish change. . .to exhibit *responsible agency*[5] by being aware of the implications of their actions on others and society more broadly" (Edwards ibid). A future-oriented learning environment not only enables learners to experience what it means to be a particular profession, vocation or role but also focuses on "relational agency" or the capacity to relate to others and cooperate with one another (Edwards, ibid).

The "six principles of learning design" also invites people to think about the role of a teacher or educator that shifts between being an expert and source of knowledge, and/or a facilitator and critical questioner. The roles shift depending on the needs of learners and circumstances. While the roles may shift dynamically, the ethics of respect, recognition, and enabling of learners' agency does not (shift): learning is scaffolded or built on the learners' capabilities and decisions rather than on the basis of deficiency, lack, or defectiveness that implies "fixing" and/or "repair".

[5] Italics are mine.

Table 6.1 The six principles of learning design

Principle	Definition (what)	Examples (how)	Impacts
Authenticity	Use of real world work practices and settings. Embodies complexity of work and enables engagement.	Peer sharing of experiences;	Note that in authentic design, learners are actively engaged, the activities lend themselves to lots of dialogue amongst peers to assist with developing deep understanding that is holistic. As such there are opportunities to experience the embodiment of learning, to bring theory and practice together, to integrate technical/ disciplinary knowledge with soft skills. As such, knowing and doing are integrated. This is the importance and value of authenticity – It enables the achievement of the five other principles.
	Authenticity does NOT necessarily mean that all tasks or activities are about doing the work in real work settings – as this is not always. The alternative is to bring the complexities of the work into the classroom environment and/or tech-enabled environments.	Complex case studies based on real life examples;
		Solving of complex problems that are based on real life examples;
		Practice exercises that require application of technical and generic/ soft skills;
		Tasks/activities that reflect performance required in work settings;
		Tasks/activities that mirror the way knowledge and skill is performed in real settings and/or take place in real work settings.
Alignment	Design that involves every aspect of learning so that all work together.	The learning purposes and outcomes, assessment design and learning activities, and the place of learning need to support each other.	Provides flow and seamless sense-making and development
		For example, if a course intention is to enable learners to develop, implement and track a digital marketing plan but the learning consists mainly of a series of lectures, class discussions, and a final exam, then it is clearly not aligned. For there to be alignment, learners need to have the opportunity to put together an actual digital marketing plan, and/or simulate a corporate presentation where learners discuss, debate, and defend the merit of their plans.

(continued)

Table 6.1 (continued)

Principle	Definition (what)	Examples (how)	Impacts
Holistic	Integrates knowing, doing, thinking and feeling; integrates theory and practice, technical and generic, learning to learn, and taps on multiple senses.	Practice, practicum and/or hands-on sessions could be designed to introduce the complex and dynamic realities of work or workplace in which the skills are being performed.	Holism aims for learning to be inclusive of the wider ethics and values of the profession and/or occupation AND of integrating knowledge, skills and experience.
		Scaffolding is necessary but that is not just on the technical skills but integrates technical, generic, theory and practice.	It implies that learning is inseparable from the learner and that which is learned, and/or the fact that doing, thinking and being are interconnected. Hence, taking a holistic approach to the design of curriculum is key to developing the core of what it means to be a particular professional, or role or vocation.
		Another strategy is to place learners in actual or real work settings to observe. Learners will then share and discuss their observations – online, or in class or at work.	
		Learners may also be gradually given responsibility to do some of the work.	
Feedback	Feedback is a practice and form of communication. It is dialogic i.e. a discussion involving listening, giving and receiving feedback from multiple sources, opportunities for learners to act on their feedback.	Feedback loops can be created throughout the duration of a module or programme that enables learners to:	Learners who are able to receive and give quality feedback generally develop better judgment. Feedback provides the opportunity for dialogues, and development of a shared/common vocabulary or syntax about the world they are in.
		Understand how they are progressing;	Feedback entails listening, which goes beyond hearing. To listen "is a permanent attitude on the part of the subject who is listening, of being open to the word of the other, to the gesture of the other, to the differences of the other" (Freire, 1998, p. 82).
		Develop clarity about their own and others' expectations, and understanding about what they are doing;	
		Understand how they can make improvements.	
		Feedback from multiple sources – self, peers, educator, supervisor – enables and deepens the above.	
		Feedback and judgement can be applied as dependent variables in the design of learning.	

(continued)

Table 6.1 (continued)

Principle	Definition (what)	Examples (how)	Impacts
Judgment	Enables learners to make judgments about their own and others' work. Involves making and evaluation of ethical judgements.	Facilitating and enabling learners to make or form judgments entails:	There can be no real or good judgment without any form and practice of feedback. The ability to critically evaluate, consider moral implications, contextualise, and make informed decisions are indicators of judgment.
		The learning design gives opportunity for learners to make judgements of own and others performance AND to act on feedback;	
		Multiple opportunities over time, are given for learners to compare their current work with the expected quality of work;	
		Learners contribute to, or at least discuss, the agreed criteria for making judgements;	
		Learners are given responsibility for their learning – giving too little responsibility may mean that learners feel lost and unclear about what to do.	
Future-orientation	Involves learning to learn, deep understanding thus enabling application to multiple situations and contexts. This includes consideration of multiple perspectives, and inquiry.	Facilitate and enable learners to:	Future-orientation is not just (a list of) twenty-first century skills like critical thinking, problem-solving etc. but as a practice that contributes to the autonomy or agency and interdependency of people, and a democratically equal environment.
		Discuss and think about how they are approaching a particular challenge;	
		Become aware of the types of questions they ask, of how they approach a challenge, that is unfamiliar;	
		Compare and contrast; to work out the pros and cons of different ideas, approaches, solutions, etc.;	
		Be exposed to different perspectives, experiences and processes and discussing these and making judgements about what works best for them, or what best reflects their beliefs, values, etc.	

Adapted from Bound and Chia (2019)

Finally, the "six principles of learning" has provided a structure for fleshing-out future-oriented learning that does not reduce learning to a mechanistic acquisition of knowledge and a disembodied sense of knowledge, which rob learners of their subjectivity. Instead, the "six principles" articulates a future-oriented learning which empowers, enables learners' agency to work with others, and creates an environment of mutual responsibility and/or interdependency.

Conclusion

The critical reflection on future of work helps to raise ontological questions about learning – what is the nature of learning, what are the purposes, and how is learning related or connected to social change. Thinking through these questions shape our collective responses and approaches to learning. I argue that learning or future-oriented learning which seeks to address some kind of future cannot ignore the social, political, and ethical ramifications. These future possibilities and implications are embodied in the concept and metaphor of transition, which captures the liminal experience, and changing quality of life and work as a result of socioeconomic and technological changes. More importantly, transition evokes the uncertainty and flux of future worlds, and compels us to seek solutions and see possibilities in new and different ways in order to survive and thrive in these uncertain times.

I propose that future-oriented learning is a practice concerned about democratic equality. Its vocabulary of growth, development, participation and engagement, dialogue, listening and relating to, embody ethical and political qualities. It is demonstrated by the "six principles of learning design", which disrupts the commodifying tendencies evidenced by the technicalised or proceduralised language of learning or training informed by economic utilitarianism and industrial planning. Just as Paulo Freire's work on literacy and critical pedagogy insists that education is not a means to make subordinated labour or workers out of students (Giroux, 2010), future-oriented learning focuses on empowering people, encouraging autonomy and individual agency towards mutual responsibility and interdependency, and developing the capabilities of democratic equality.

For the reasons mentioned above, future-oriented learning rejects educational regimes which prioritise market demands and instrumentalised knowledge over learners' overall development and well-being, independent thinking, and community building.

Finally, future-oriented learning as a response to the constant flux and change elaborated by scholars who have pioneered the study of the "future" such as Ulrich Beck and Zygmunt Bauman, makes the case for an approach that invites critical reflection about the nature and purposes of learning, and to enable learning towards a future of democratic equality. I argue that this approach is necessary for establishing the social and political basis of any design and/or development of future-oriented learning (programme) that seeks to "create a capacity for learning not only in order to adapt to the world but especially to intervene, to re-create, and to transform it" (Freire, 2001, p. 46).

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Dr Arthur Chia (PhD), Senior Researcher, Institute for Adult Learning, Singapore University of Social Sciences, Singapore

Arthur Chia is a Senior Researcher at the Institute for Adult Learning, Singapore University of Social Sciences. His research focuses on work and learning in social and economic contexts. Arthur seeks to showcase the various complexities and dynamics of work and learning.

Part III
Flipping the Lens in Practice

Chapter 7
Enhancing Learning in the Workplace

Christine Owen

Abstract In rapidly changing circumstances the organisation of work takes on important convergences. These include an intensification of work processes; and increased expectations driven high market and community expectations of reliability of supply, and high levels of reliance on modern and emerging technologies – especially information and communication technologies. In these changing work contexts learning in the workplace becomes increasingly important. In these workplaces learning is critically important. In the chapter learning is framed as inherent to the nature of work in these contexts.

Individuals learn formally and informally; they learn variously through watching others and they learn with others. At an organisational level learning is also important when the experiences of workers are captured so that these organisations may adapt in order to be agile and resilient to unknown futures. In this respect, learning is a two-way process. The focus is not just on how workers learn either formally or informally, but on how organisations learn from the experiences of their workforce in order to adapt in an increasingly competitive economic environment.

In the chapter learning is theorised both from a psychological standpoint and a socio-cultural perspective. This is because both contribute to our understanding of the formal and informal processes involved. Drawing from an adaption of experiential learning the chapter analyses the ways in which elements of work organisation can both enable and constrain the processes important in learning: reflecting on, making sense-of and envisaging new futures that may be experienced in the workplace. By using research conducted in the air traffic control workplace the chapter highlights the ways in which work organisation shapes the experiences of work and the ways in which reflection is mediated by narratives and stereotypes that become part of a cultural collective memory. Conceptualising, is the process of making sense of what has occurred, to interpret reflections on experience and to generalise these interpretations to new settings. However, what will be noticed and attended to will also be shaped by organisational cultures which are based on collectively held

C. Owen (✉)
College of Arts, Law and Education, University of Tasmania, Hobart, Australia
e-mail: christine.owen@utas.edu.au

H. Bound et al. (eds.), *Pedagogies for Future-Oriented Adult Learners*, Lifelong Learning Book Series 27, https://doi.org/10.1007/978-3-030-92867-4_7

beliefs and values (where schemas or shared mental models of sense-making are embedded). These in turn generate norms of practice. A final element essential in the learning process is experimentation. Envisaging new alternatives may occur also in thinking about past actions (reframing). In this case an expansion of the range of choices available might be made though they may or may not be acted upon in the future. Opportunities for experimentation are mediated by the structuring of work experience as well as workplace cultures. In high intensity, high reliability and high technology workplaces learning from near misses and mistakes can be framed as a form of experimentation. In drawing on these events as a resource it is possible to reframe them as valuable opportunities for learning.

In rapidly changing circumstances learning is increasingly part of the currency of production and of safety. In the future organisations that are most productive will be those who understand the value of learning from events that happen in the workplace. This will be particularly so as work continues to increase in intensity in terms of demands and multi-tasking and when there is a need to be more efficient and agile.

Keywords Workplace learning · Experiential learning · High intensity · High reliability and high technology workplaces

The dynamism of work processes, workplace organisations and markets demands of us a wider focus on the full range of workplace learning contexts. To consider how facilitators and designers of workplace learning spaces may support learners for unknown futures I would like to propose that we perhaps need to be enhancing our peripheral vision – a kind of conceptual and practical cataract surgery – such that we can scrutinise and attend to *all* modes of workplace learning.

Given the expansive view of learning adopted in this chapter workplace *learning* is defined as the process of transforming experience through reflection, sense-making and experimentation which leads to an increased capacity to act differently in the environment (after Kolb, 2014). It is distinguished from individual training and competencies that are part of skills packages.

This chapter argues that we need to be sensitive to the range of structural and cultural factors that enhance and inhibit learning in workplace contexts. Workplace learning can be formally accredited and instructor-centred; it can also be informal and incidental. Finally it can occur at individual team and even organisational levels. Individuals learn formally and informally; they learn variously through watching others and they learn with others. At an organisational level learning is also important when the experiences of workers are captured so that these organisations may adapt in order to be agile and resilient to unknown futures. In this respect, learning is a two-way process. The focus is not just on how workers learn either formally or informally, but on how organisations learn from the experiences of their workforce in order to adapt in an increasingly competitive economic environment.

The Future of Work and Implications for Learning

It is proposed that there is an important convergence occurring across workplace organisations, such that workplaces in the future will take on the features more and more of what I have labelled "High-3" characteristics: high intensity of work processes, high market and community expectations of reliability of supply, and high levels of reliance on modern and emerging technologies –especially information and communication technologies (Owen, 2017).

"High-3" (high-intensity, high-reliability and high-technology) workplaces rely on technologically-mediated work which can be complex and involve higher-order thinking (i.e., where the path of action often yields multiple solutions and requires nuanced judgement); intense because of time imperatives coupled, often, with significant complexity; and high-reliability because an error can potentially lead to unacceptable consequences not merely for lifestyles but for life-chances (Owen, 2014a, b, 2015).

High-3 organisations are observable in virtually all industry sectors, although the more-developed examples are to be found within transportation (e.g., air and sea), the military, police, emergency services (e.g., ambulance and firefighting), health services (e.g., operating rooms), manufacturing (e.g., chemical industries); critical infrastructure (e.g., water, energy, telecommunications) and key elements of the finance sector (e.g., banking, stock exchanges). Moreover, the proportion of organisations characterised by these forms of work is growing and will become more important in the future, as part of the growth of a knowledge-based economy, as is our reliance on them (e.g., Hoc & Carlier, 2002; Hollnagel & Woods, 2005; Soraji et al., 2012).

It is contended that our interest in these high-3 workplaces should not stem only from their *current* importance in our economies, and our lives. Rather, we should recognise the range of social and economic factors that are inexorably requiring that *all* workplaces move to exhibit high-3 features. Competition between firms – indeed between nations – revolves around gains in productivity, the efficiency with which we transform inputs into marketable outputs. In all industry sectors (and no less in public service sectors), we are witnessing pressure to lower unit costs, to respond quickly and reliably to consumer demands, and to interact with consumers via contemporary and emerging technologies (Barton & Sutcliffe, 2009; Bound & Rushbrook, 2015; Grote et al., 2008). Whether we are comfortable with this or not, the future is likely to see businesses succeed or fail based on their capacity to embrace intensity, reliability and technological mediation.

Organisations deliver highly reliable performances when members have the ability to prevent and manage challenges before they spread throughout the socio-technical work system causing widespread damage or failure (Barton & Sutcliffe, 2009, p. 1329). This occurs when team members engage in social mechanisms for monitoring and reporting small or weak signals to one another (e.g., that something might be wrong) and members have the capacity to adjust to these changing conditions. This requires empowered communication climates where robust

discussion employing diverse perspectives can be encountered. Thus members of future focussed work environments will have both the flexibility required and the capability to respond in real-time, reorganising resources and actions as necessary. In this regard high-reliability organising and safety is achieved through human processes and relationships. Members share what they know, raise concerns about weak signals of possible failure, and the team adjusts, tweaks, and adapts to these small cues or mishaps. If these signals are left unaddressed they could result in larger problems and potential failures in safety (Owen, 2017).

The implications for learning in the workplace are that the very skills we might think of as learning (e.g., asking questions, sharing observations; giving and seeking feedback; making sense of new information; seeking alternative perspectives, seeking clarification, and consulting and collaborating) will be increasingly needed in a range of work roles, blurring the line between formal and informal workplace learning.

Finally, workplace learning is also important in another respect. For organisations to adapt and thrive in a fast-paced globalised and competitive world, learning has to become integral to the work itself. This means that organisations need structures and cultures that can capture and learn from the experiences of workers and teams to enable *continuous inquiry for organisational learning*.

This is especially so in High-3 environments where disturbances may be regarded as "opportunities for use and expansion of individual competencies and for organisational innovation and change" (Grote et al., 2008, p. 19). However, this also needs to be balanced with the latitude given to local actors to exercise their own agency (see Chap. 2) to handle uncertainties in a flexible manner – latitude that is necessarily constrained by the need for standardization and centralization to prevent system failure. Bound and Rushbrook (2015) draw attention to the criticality of workplace relationships, and to the intertwined human and social processes of learning and working. In addition, any analysis needs to account for the active nature of workers in shaping their workplace contexts – as well as being shaped by them. This is an important theme in this book: the ways in which context is integral to learning and the agentic nature of workers in shaping their learning (see also Bound et al. Chap. 2, this volume).

Theorising Workplace Learning

The need to widen our attention from teaching to learning requires an enhanced emphasis on the ways that individuals (and teams and organisations) actually learn. This obliges us to acknowledge the contribution of conventional (psychological) theories of learning and move beyond them to incorporate socio-cultural insights. Conventional theories of learning focus on the processes involved in individual skill acquisition resulting in durable changes in cognition and behaviour. This is still important in our understanding of the development of expertise (e.g., Chi et al., 2008). Socio-cultural theories of learning suggest that learning, particularly in a

workplace, cannot be separated from its context (Lave & Wenger, 2002, 2005; Bound et al., Chap. 2, this volume). Learning and development do not occur solely inside an individual mind as psychological theories would suggest but rather emerge as one proceeds through a task in collaboration with others and involves the use of artefacts (i.e., tools as resources such as technologies or procedures). Learning also occurs socially through watching others (e.g., vicarious learning –Bandura, 2001). In this respect learning is intertwined with the technical performance of work, its social networks being seen as a shared social practice (Gherardi, 2009; Collin, 2006, 2008).

From this perspective, then, the difference between psychological cognitive approaches to learning and socio-cultural approaches is that the focus of attention switches from the individual to the group or community of practice. In this way, Konkola et al. (2007, pp. 213–214) argue that expertise is not just developed inside the practitioner's head but also "expands the structures of knowledge to include not just mental and symbolic representations but also ... recurring patterns of social practice." From this point of view, what is regarded as "good" practice is not just determined by some external normative set of regulations but what, informally, the work group regards as important (or not), as culturally valued (or not). This raises a key question for practitioners of learning: to better understand what the learning group values (or not); feels is important (or not); and what members of the group believe is important to learn (or not). Unpacking these frames and how they shape worker identities will be important if we are to move toward a future orientation in being and becoming as contended by Bound, et al., (Chap. 2, this volume).

Learning embedded within work practice is important in all workplaces. It is especially important where work practices are fast-paced, require higher-order thinking and where the reliability of operations is critical. In these environments, learning-related communication as part of the ongoing process of work is vital to enable the constant adjustments needed in managing dynamic events.

A Framework for Learning in the Workplace

To elaborate on processes important for workplace learning, a framework of learning will now be outlined where their implications for workplace and designers of work/learning spaces can be discussed. The framework chosen for exploring these questions is drawn from an experiential learning theory originally developed by David Kolb (1984). This framework has been selected because it grounds learning in actual experiences rather than classrooms or training environments and because it is well established in both education and organisational learning. Kolb proposed that for learning to occur a learner moves through four processes: experience, reflection, conceptualisation (sense-making), acting or experimenting in new ways. For the purposes of this analysis the following definitions, adapted from the four elements identified as integral to learning by Kolb are offered:

- Experience occurs as part of being-in the world and may be registered through what we see, think, hear and feel as we interact with our environment. It may occur directly or may be experienced indirectly through others (e.g., vicarious experience).
- Reflection is the process involved when attending to, noticing, recalling elements that are significant in the experience and can be either passive or active.
- Conceptualisation is the process of thinking about, making sense of, interpreting and comprehending those reflections and experiences.
- Experimentation is the activity associated with developing choices and envisioning new ways of acting that may have occurred in the past, be occurring in the present or likely to occur in the future.

Kolb's work draws on early theorists of cognition and human development to content that learning occurs as a result of a resolution of a contradiction or conflict between opposing ways of dealing with the world: between reflection and action on the one hand and between doing and thinking on the other. Underlying these processes of learning about the world is the notion that both apprehending (grasping understanding) and comprehending (understanding and moving on) are important. There is a similarity here with the micro-interactions and discourses discussed in Chap. 2.

The very nature of a dialectical process means that engagement may move back and forth between processes such as reflection and experience (or any other parts of the experiential cycle) before progress in learning is achieved. Although Kolb (1984) discussed the dialectical movement between the various processes involved in learning, his work has been popularised as a set of four "stages" involved in the learning cycle, and these are frequently presented as if they are discrete entities that occur in a rigid, unidirectional cycle.. Learning can be triggered at any one of the processes. Some people may, for example, start by creatively experimenting with something to see what happens. Others may need to have a bigger theoretical picture – to understanding the theoretical principles or philosophy before proceeding to experience. What is important however is that while one part of the cycle may be the starting point or be greater in emphasis, all four are necessary if learning is to occur. Thus these four elements of the learning cycle identified by Kolb can be fused within a particular work activity.

For the purposes of this chapter, however, they are discussed separately so that their insights about what needs attention in workplace learning can be discussed. Before proceeding it is useful to examine the strengths and limitations of this approach.

An important strength is that Kolb does not make the mistake of equating learning with the acquisition of knowledge. For Kolb, learning must be evident in what people do. Second, in organisations, problems are both the stimulus and the medium for learning. In this respect, Kolb's model is directly applicable to conceptualising how people in organisations may experience problems and learn from them. Third, his model draws on explicit processes that are necessary for effective learning to occur and thus provides a useful framework for explicating phases of learning (Fig. 7.1).

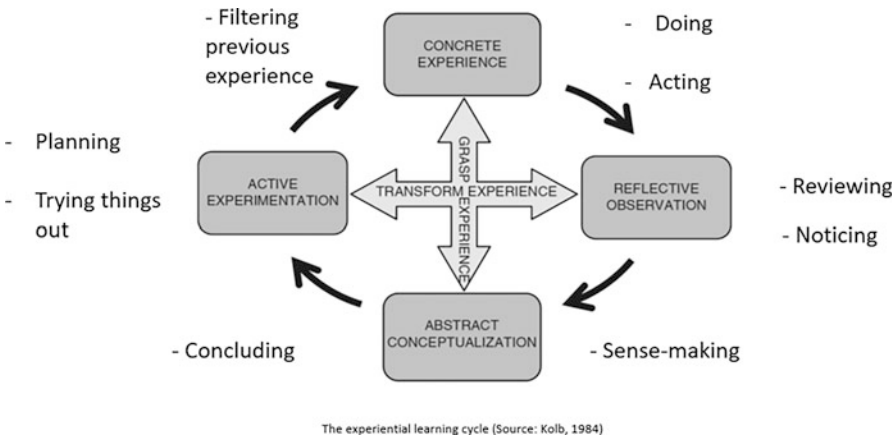

Fig. 7.1 Expanding experiential learning. (After Kolb, 1984)

Kolb's framework needs to be adapted to illustrate the influence of contexts on learning in the workplace. From a sociocultural perspective, the social environment – the work group and other communities of practice – also influences learning. Learning is mediated by elements found within the immediate situation. The tools and physical resources people have available to them would also structure their learning, as would histories of previous experiences of people and their structural roles within activity systems (Engestrom, 2004). Table 7.1 outlines the key aspects discussed in this chapter.

The Role of Experience in Learning in the Workplace

According to Boud and Walker (1993) "experience is created in the transaction between the learner and the milieu in which he or she operates – it is relational" (p. 11). Experiencing is always grounded in a socio-cultural context and is, therefore, influenced by artefacts. In the workplace context, for example, experiences are structured by the artefacts used in work organisation, such as the physical resources, policies governing activity which structure workplace experience, and opportunities for experience. However, experience also involves perception, implies consciousness and always comes with meaning (Boud et al., 2006). Given that interpretation of meaning is the foundation for culture, culture is thus always embedded in the interpretation of experience. The structuring and interpreting of experience will influence opportunities for learning in certain ways because structures will make certain opportunities available and not others and cultures will focus attention on particular interpretations of the experience and not others.

Table 7.1 Process of learning

Process of learning	Elements of workplace contexts
Experiencing (involving physical; psychological and social aspects of work practice)	Physical design of organisation of work influences the kind of experiences people have;
	Use of technological artefacts make work visible or hidden
	Degree of differentiation of job tasks
	Workforce development policies shape experiences workers can have
Reflecting (observing, narrating, remembering, pattern seeking, labelling)	Tempo of work enables or constrains opportunities for reflection
	Structuring of job roles;
	Organisation of work into teams
Conceptualising (sense-making; reframing, pattern generating, accounting for; explaining)	Occupational and social identity formation; collective schemas (in-groups/out-groups)
	Shared beliefs and values (stereotypes)
	Collective remembering (e.g., war stories)
	Group norms of practice
Experimenting (envisaging, (re) evaluating; adapting, innovating)	Policies and rules shape the degree of latitude available in choices that can be applied
	Shared experience through teamwork

In my own research investigating how trainees in air traffic control experienced learning in their workplace I found that the way in which the work was organised emphasised four dimensions of experiencing (Owen, 2009b, 2008, 2017). Air traffic control work is experienced corporeally, complexly, affectively and socially. Since the work cannot be stopped and problems must be addressed in the moment, trainee controllers use their bodies to indicate when they might be getting overloaded (e.g., perspiring; standing up to work rather than remaining seated; getting red in the face). Second, the work is structured so that it is also experienced complexly. Complex work requires the coordination of multiple tasks that in turn require higher order thinking and in combination with the temporality of work. Practice is needed to build up awareness and understanding of the various permutations of problems and problem solutions that successful task completion may require. An affective dimension is also evident given that one's performance is on show and is therefore an expression of self to the group. This is akin to the importance of the self and social identities as raised in Chap. 2, this volume by Bound et al. Finally, a social dimension is evident in the interdependence of job tasks where work building up on a neighbouring console is a signal of workload that can be anticipated.

These dimensions of experience are arguably characteristic of work generally, but are especially important in the future as work practices take on more of the features of High-3 work. Work may be intense on the body; easy or demanding on the mind; an expression of, or alienation of, the self and it always occurs in a social context, although some forms of work organisation provide more emphasis of the social than others. The key point here is that the way work is organised shapes opportunities for experience in certain ways and it is important for both facilitators of workplace

learning and designers of work and learning spaces to consider this element. In addition, examining the ways in which organisational structures and cultures influence the transformation of experience into learning by enabling or constraining reflection is worthy of focus.

The Importance of Reflection for Learning in the Workplace

In learning theory terms, reflection is an essential ingredient for learning (Boud et al., 2013; Brookfield, 2005; Schon, 1991). Reflection involves attending to the salient features of an experience, marking and noting those features through labelling and pattern seeking. It consists of those moments individuals engage in to recapture, observe and notice and to begin to make sense of their experience: "to work with their experience to turn it into learning" (Mason, 1993 p. 9). Individually, the degree to which reflection is engaged in will depend on the motivational levels of the person to make sense of the experience and their interpretation will be influenced by their sense of self-efficacy.

In the workplace, cultures are based on the salient features of experience which are noted, collectively remembered and attended to through narration and through the common language and symbols that work groups use to share and express their experiences with others (Augoustinos et al. 2014).

Reflection on experience also becomes part of collective memory– in the case of many High-3 work contexts like aviation and emergency services – through the narration of "war stories". In these contexts, cultural processes of reflection can be found in stories workers share about their experiences (good and bad) where through the stories one learns how to operate if the same experience is confronted. War stories provide access to previous experiences of unanticipated disturbances. War stories are the stories of a worker's experience when something dramatic happens, perhaps because of an individual's performance (or lack thereof), system deficiency or an unexpected event. War stories are used to help illustrate both good and bad actions, right and wrong ways of operating, thus supporting informal learning. War Stories are important artefacts within the specific forms of collective reflection on "critical incidents" discussed later in this chapter.

In terms of organisational structure, capacities for reflection are variously designed into job roles. The form of work organisation characterised by Taylorism, for example, was predicated on the basis of removing opportunities for reflection (and conceptualisation) from certain job roles. In future-oriented work contexts where work is likely to be of a faster pace to the extent in some circumstances (e.g., aviation emergency services) where it cannot be stopped, reflection can be limited and so both facilitators of workplace learning and designers will need to look for other ways of embedding reflection into work practice. In my own work, I found that reflection also occurred in individuals watching others and when those individuals took on instructional roles where they were required to observe a trainee and provide feedback (Owen & Page, 2010).

Encouraging reflection as part of work activity has been a feature of many professional development programs (see for example, Schon, 1983, 1987). However, some work cultures (and their worker identities – see Chap. 2) may resist engagement in reflective practice because such activity is neither part of their history of experience nor part of their collective identity.

In terms of enhancing all forms of workplace learning, facilitators and designers need to ensure a variety of means of capturing experience so that it can be reflected upon later. These may include checklists about what elements of the experience need to be captured now so that they may be reflected upon later. Having appropriate time and space organised into work activity to reflect will also be important, as will be having a facilitator who can ask the critical questions. Capturing experience is not just important in accredited workplace learning but also for the organisation to learn from the experience of its workers. In my work in the emergency services domain, personnel need to find ways to detect weak signals that something may be going wrong (or has gone wrong) so that it can be examined at length later. One way of doing this is to revisit the experience after an event in a debrief process and walk back – sometimes literally as well as figuratively – through the moments that led to the challenges that were faced (Owen, 2014a).

There is a close link between individual and collective processes of both reflection and the next phase of the learning cycle, conceptualisation (or making sense of reflections on experience). Structures and cultural contexts also enable and constrain the next process in the learning cycle, conceptualisation.

The Role of Conceptualisation for Learning in the Workplace

Conceptualising, is the process of making sense of what has occurred, to interpret reflections on experience and to generalise these interpretations to new settings. Many learning theorists find it difficult to tease out reflecting from conceptualising, since the process of making meaning relies on the interconnection of noticing, interpreting and making sense (see Argyris, 2004; Augoustinos et al. 2014). While the processes of reflection and conceptualisation in learning have been separated it is acknowledged that in the everyday world these elements are closely intertwined. The conceptualising process begins with the elements of reflection (observing, noticing and labelling which triggers remembering).

Conceptualising is a practice whereby the meaning from the experience is generated into concepts or ideas that can apply to situations beyond an explanation of the immediate experience. As such, conceptualising has also been called theorising. Mason (1993) commented that the term *theorising* is based on the Greek root *theoria*, meaning *a way of seeing* and *abstracting*. One of the meanings of abstracting is the search for or distillation of essence or structure. Mason's comments demonstrate also the close linkage between the processes of conceptualisation and experimentation – the next element in the learning cycle, since noticing and interpreting leads to the development of alternatives that can be

used in the future. Conceptualising, or generalising from one experience to another, involves identifying patterns in experience found through reflecting and generating ideas about those patterns in other events. Organisation and categorisation of perceptions enables comprehension and interpretation of the social world. In theories of "reflective learning" or "reflection-in-action" (Argyris, 2004; Schon, 1983, 1987, 1991), the elements of reflection and conceptualisation are evident but not separate. For these theorists, the processes of reflecting and conceptualising together are called "reframing". That is, an initial perception is transformed into a new understanding or frame. In Chap. 2, (this volume) Bound and colleagues outline a process of reframing that occurs through a dialogical processof self-reflection.

However, sometimes, conceptualising or reframing is constrained by what is observed or noticed, a feature that is important in social cognition and constructivism. For Resnick (1993), interpretation of experience is based on schemas that both enable and constrain individuals' processes of sense-making. A schema provides an interpretive framework that allows reasoning to proceed (Resnick, 1993).

As an interpretive framework, provides the foundation and is embedded with a workplace identity. It is often based on past history, sets up expectations about what will be important, and therefore will help guide what we attend to, what is perceived, what will be remembered and what will be inferred. What this illustrates is that schemas are not purely individual constructions but are heavily influenced by the kinds of beliefs and reasoning schemas available in the individuals' surrounding culture (Resnick, 1993). Individual and collective schemas are thus obviously mediated by cultural contexts, since organisational cultures are based on collectively held beliefs and values (where schemas or shared mental models are embedded) and these in turn generate norms of practice (Augoustinos et al. 2014).

Thus, cultures tie the actions of individuals to a particular group (or groups) and reveal, through justifications for group membership and the informal language that is used, what is collectively valued within the group (and what is not). Organisational stereotypes (or organisational myths and archetypes) also inform about what groups value (or indeed worry about). This idea of archetypes also fits with Dorothy Holland's account of social identities. Holland draws on Geertz's webs of meaning to describe cultures and identities made up of what she calls figured worlds.

> Figured worlds take shape within and grant shape to the co-production of activities, discourses, performances and artefacts. A figured world is peopled by the figures, characters, and types who carry out its tasks and who also have styles of interacting within distinguishable perspectives on, and orientation toward it (Holland et al., 1998, p. 51).

Within such cultural productions "significance is assigned to certain acts and particular outcomes are valued over others ... these collective 'as-if' worlds are socio-historic, contrived interpretations or imaginations that mediate behaviour" (Holland et al., 1998 p. 52). In my own work I found that shared war stories were also used to project the collective identity of two archetypes: the "gun controller" and the "adrenalin junkie". In terms of what was valued in air traffic control performance a "Gun" controller was regarded as someone who demonstrates superb performance (such is their level of skill, ability and confidence) without even trying.

The gun controller was portrayed as having a limitless supply of energy, awareness and prescience, overcoming the limitations of the body and is never exhausted. In contrast, the negative construction of the gun controller is the adrenalin junkie. An adrenalin junkie was portrayed as someone who wanted to be a top performer (a gun) but who did not have the ability to support the performance.

In addition to culture, sense-making is influenced also by organisational structures when the activities of explaining, accounting for, and pattern generating are built into job tasks and roles.

For investigators of workplace learning, the contextual elements of organisational culture (such as collectively held beliefs, values and norms) are resources because they influence perceptual selectivity and the development of individual and collective schemas about work practice (Augoustinos et al. 2014). In addition to influencing events, collectively held beliefs and values will also be reproduced by individuals and groups in the kinds of continuous learning strategies used in work activity. Collective beliefs and values, therefore, will lead to some things being noticed – and indeed emphasised – rather than others. Thus, schemas and identities enable and constrain both individual and collective opportunities for learning.

This includes the sense-making not just of learners in the workplace but also of workplace instructors because their own reasoning processes about what is important will guide how they approach the trainee. From this point of view, acting subjects (which includes both workplace learners and their instructors), when engaged in their workplace activity (learning/instruction) will use strategies that are mediated by collectively-held values and beliefs and other artefacts of organisational culture, such as stereotypes and norms of practice (see for example Wertsch, 1998; Engestrom, 2004 and Bound et al Chap. 2, this volume).

In my own work I have found that instructors would sometimes use workplace learning to "weed out" those not conforming to dominant norms of practice or stereotypes because their performance did not meet with instructors' conceptualisations about what was "good" performance (Owen, 2009a, 2017). This indicates that it is important to analyse the role of workplace cultures in enabling or constraining learning since what constitutes "good" is relational to the group. Moreover, norms of practice can also exclude key members of the group, for example women (Owen, 2012) in predominately "macho" workplace cultures.

Do existing workplace cultures need to change in order to enhance learning? Quite often within organisational culture literature, there is an implicit assumption that the existing community of practice or culture is appropriate and desired and "enculturation" is needed for newcomers to understand existing ways of working. However, these cultures may also lead to conformity (Balthazard et al., 2006), something identified as inhibiting the development of practices associated with continuous inquiry. Cultures can enhance learning, though they may also sustain existing patterns of belief and thereby learning to conformity, or non-learning (Balthazard et al., 2006). That is, culture may reproduce existing relations rather than change. Therefore, there needs to be a focus in examining what existing workplace cultures and identities may inhibit learning toward a future orientation.

One approach to changing cultures has been identified by Putnam and Borko (1997) of a cognitive-mediational program that encouraged teachers involved in professional development to interview someone who is likely to challenge their beliefs. One option for consideration includes having instructors examine their reasoning with other practitioners who hold opposing belief systems. Cognitive mediation is based on constructivism which suggests that all experience and learning is filtered by what the individual currently understands and believes. Constructivism has two forms: cognitive constructivism, which focuses on an individual's internal schemas and mental models for making sense of the world; and social constructivism, which emphasises the role of the social context in shaping what is learned (Putnam & Borko, 1997). Therefore, an individual's current belief systems are going to influence what that person accepts and learns. In addition cultural beliefs will enable and constrain what is observed, noticed and thus received (Resnick, 1993). Change can also be encouraged through getting workplace instructors to examine their practical arguments. A practical argument describes a person's reasoning about actions by specifying the rationales, empirical support, and situational contexts that serve as premises for the actions (Putnam & Borko, 1997). The assumptions behind such inquiry are that when instructors examine their beliefs with a valued other (e.g., a practitioner who is well regarded), then there is a critical examination of those beliefs that is likely to lead to a change in thinking, or at least a questioning of previous assumptions.

Experimenting in the Workplace

A final element essential in the learning process is experimentation. According to Kolb (1984), learning is limited if an individual formulates concepts to generalise to other settings, but fails to test their validity. It is contended that testing the validity of conceptualisations, based on reflections on experience, can be done through evaluating past experience and envisaging new alternatives to be put into action immediately or sometime in the future.

Envisaging new alternatives may occur also in thinking about past actions (reframing). In this case an expansion of the range of choices available might be made though they may or may not be acted upon in the future. Therefore, for the purposes of this discussion, the term "experimenting" has been emphasised because it can involve reframing actions that occurred in the past, action to be taken in the present and also it can mean developing choices to put into action in the future. Experimenting then, refers to developing choices and envisaging new ways of acting. These choices and alternatives are tested out mentally and/or practically through developing alternative plans of action for the future and acting on those alternatives when appropriate.

Expanding the range of choices and alternatives available is mediated by conceptualisation, which, as previously discussed, involves generalising concepts to new settings. Argyris (2004) proposed the idea of "single loop" and "double-loop

learning" as an indicator of the ways in which developing choices for future action was mediated by conceptualisation (or sense-making – see Chap. 6, this volume). Individuals and groups involved in single loop learning have limited alternatives and possibilities for action available to them because they operate without testing the basis of their understandings and assumptions (based on their beliefs and values) about the problem or situation. When organisational members have the awareness and ability to recognise their underlying assumptions and to test their validity, and modify their thinking, double loop learning occurs.

Organisational contexts enable and constrain opportunities for experimentation for both individuals and groups in a range of ways. Structures such as team-work, for example, increase possibilities for experimentation because they enable a shared continuity of experience to occur across team-members and thereby enable the experience to be used as a resource for inquiry to generate increased possibilities for action. However some teams may include dominant members who hold beliefs that reflection and learning is not important (e.g., the gun controller who has "the right stuff" and does not need to learn) may inhibit other members in their capacity to reflect. In this respect organisational culture influences individual and group opportunities for experimentation to the degree that such practices are enabled and constrained by collective norms of practice – shared conceptual schemas that account for how the world works as well as shared capacities for collective remembering. Similarly, policies and rules within a workplace may limit the capacity for to learn from others in the team if members are homogenous in their previous histories of experience rather than diverse. In this respect opportunities for experimentation are limited. Policies and rules within a workplace may also embed behaviours aimed at generating alternatives into job tasks and roles..

Opportunities for experimentation are mediated by the structuring of work experience as well as workplace cultures. It is important for facilitators of workplace learning and organisational designers to develop strategies needed to enhance intentional and shared experimentation. This is important to provide the future focus needed in workplace learning to practice continuous inquiry.

If new strategies are found to challenge existing conceptualisations then practitioners need to be given opportunities and encouragement to experiment with those changed practices in intentional ways and be given support until those practices become the norm. One means of doing this is to provide role models who display the kinds of thinking and practice that support goals of continuous learning, enabling participants to engage in private experimentation as they observe and learn vicariously.

Intentional forms of experimentation can be shared by creating emergent communities of practice that are supported as individuals and groups begin to learn new ways of acting and to develop new belief systems that accompany changed practice. Emergent communities of practice can be supported by workplace facilitators through follow-up sessions after accredited learning programs and these may be face to face or utilise other means of group discussion, through social media.

Moreover, at an organisational level, as a resource for learning, experimentation might take place intentionally or unintentionally. Investigating near misses and accidents in this respect can be thought of as unintentional experimentation which, although the outcome might not have been as intended, are nevertheless valuable opportunities for learning. What will be important in the future for organisational learning is for designers to look for ways to more consciously look for opportunities to use experience as a resource for experimentation, such as, for example, making critical incident analysis routine and part of the norm of practice.

Conclusion

In a globalised environment, learning is increasingly part of the currency of production. In the future organisations that are most productive will be those who understand the value of learning from events that happen in the workplace. This will be particularly so as work continues to increase in intensity in terms of demands and multi-tasking and when there is a need to be more efficient and agile.

It is not just specialized work environments that are becoming increasingly interdependent, mediated by complex technologies, undergoing work intensification and facing demands from ever more unforgiving political environments. These characteristics are now the feature of many work environments. The challenge for facilitators and designers is how to support workers in these contexts.

It will be helpful for facilitators of accredited workplace learning programs to consider:

- How the work is experienced and its implications for other processes of reflection, conceptualisation and experimentation;
- How reflection may be enabled or constrained by both organisational structures and cultures;
- What individual and collective sense-making occurs and what this reveals about individual and collective identity; and
- How experimentation is utilised for insights from engagement in these learning processes within and between individuals, groups, and organisational systems.

A key capability for the future of work will be the ways in which High-3 workplaces, especially those providing safety-critical goods and services, are steadily learning – at organisational, team and individual levels – to view "critical incidents" as valuable resources, as opportunities to advance learning and adaptation. While a detailed exposition of critical incidents as sites for experimenting with a range of scenarios is beyond the scope of this chapter it is worthy of mention here as critical incidents are resources available to High-3 workplaces. For these workplaces, a critical incident is in essence an externally imposed experiment, one that provides scope for organised reflection (and from this, reconceptualisation and action). An incident is an event – a temporally-discrete set of actions identifiable as being distinct from the usual flow of work practices. It is distinct in that the typical

rule-based work process elements loom as unlikely to address the challenge at hand. Instead, workplace actors are obliged to engage in "what if we did this?" reframing and to change the ways in which they would usually respond. An incident warrants the label "critical" when the actual/potential impact of the incident challenges key system elements including lives. However, an incident may also simply be a disturbance of some kind or an unanticipated novel problem that needs to be resolved.

All workplaces, not just high-3 ones, experience incidents. Many of these incidents may not be identifiable as "critical", although most will test the knowledge base and skillsets of participants. Organisations committed to workplace learning will become adept in identifying incidents and can learn from them if these are interpreted as "imposed experiments" and will build structures and cultures that mandate and encourage facilitated reflection. They will also develop "preserving the scene" skills that allow key elements of incidents to be reliably stored for later (post-crisis) attention.

In public policy terms, there is substantial scope for governments and education providers to support workplace organisations in their journey along this path to greater experimentation (self-initiated or externally-imposed) and reflection. That support might include investigating and sharing examples of good practice from other workplace sectors and other jurisdictions, as well as formal approaches to the training of key workplace actors likely to play important roles in identifying, examining and reflecting on incidents.

No organisation can forego reliability. All industry sectors have a reliability component to them. Given that technological advances continue to influence all areas of work organisation, agile organisations need to consciously construct opportunities to reflect, make sense of and experiment with the experiences of those undertaking the work. However, this can only occur when organisations also have the conditions that enable learning.

If team members are to speak up about weak signals that something may be wrong in a process of learning-related work practice, or if organisations are to learn from events that occur then pre-requisites include a willingness to learn from violations, mistakes, problems encountered in the workplace. The ability to identifiy that problems are even occurring will be difficult in environments that are hostile, have limited reflexivity and cultures that do not support speaking up (Owen, 2009c, 2015). They will also be constrained by poor data collected on work practice. If problems are unable to be discussed, learning and change cannot occur. Making problems visible is therefore knowledge, intertwined within power relations (Owen et al., 2009; Adams et al., 2017). If workers feel that they will be exposed and vulnerable (because of organizational or public sanctions) for acknowledging violations in work practice, then doing so will be resisted. Such power relations are also socio-culturally constructed. If a problem made visible is at odds with the organizational culture of a particular group, then this too will be resisted by the workers themselves. Therefore, using workplace incidents as a learning resource can be problematic.

Designers of workplace environments need to take special care to evaluate the possible tensions and systemic or structural contradictions that are present to enable incidents to be named. Contradictions (that is, tensions in systems that are often contradictory) can be positive or negative in terms of opportunities for learning. A key question for designers is what are the conditions that lead to enabling learning from incidents and what elements in the existing workplace structure and culture provide affordances or constraints to doing so?

Continuous inquiry for organisational learning relies on cultures that support collective learning. Developing and improving the community of practice by "creating active and supportive climates for experiential learning ensures that experiential learning will be shared among team members that the practice community will be self-improving, and that system redesign will be ongoing" (Benner et al., 2006, p. 293). However, this will only occur in cultures that are ready to support inquiry and learning. If we are to enhance learning as a continuous process which is embedded in and supported by such communities, we need to understand what may impede both individual and collective learning. Teasing out the tacit and implied understandings which enable or constrain learning will contribute to the enhancement of learning as a continuous and iterative process which is intertwined with and supported by socio-cultural contexts and structures.

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Associate Professor Christine Owen, University of Tasmania, College of Arts, Law and Education, Australia

Christine Owen's career history spans engagement in academia and industry to help people and organisations engaged in safety critical work to inquire into, learn from and, if needed, change their work practices. Christine has worked with safety critical organisations for over 25 years, including the aviation field, emergency medicine, the fire and emergency services industry.

Christine researches and facilitates professional development in the areas of human factors and organisational culture; decision making under pressure; coordinating high-performance teams, debriefing; and leadership and adversity, as well as coaching and mentoring. She has been engaged by industry in a number of practitioner reviews and evaluations of major emergency events. She works on a number of research projects through the University of Tasmania and facilitates professional development in partnership with institutions such as the Australian Institute of Police Management the Australian Institute of Disaster Resilience and with the Response and Recovery Aotearoa New Zealand Leadership Development Program.

Christine is passionate about supporting organisations to utilise research outcomes and establish evidence-informed practice. She has authored over 100 publications**.**

Chapter 8
Towards Expertise: Operationalizing Identity Development and Considerations for the Singapore Work-Study Programme

Rebekah Lim Wei Ying

Abstract This chapter attempts to account for the growth of expertise from an identity lens. The deliberate link between identity development to developing expertise undergirds learning to be a social and highly negotiated process. Specifically, it is proposed that identity development be operationalised by examining how the growth of one's agency is relationally linked to others, how signs and symbols are mediated by the people who use them, and finally, how the recognition and the recurrence of identity positions augment people to be who they are. Taken together, these three ways of operationalizing identity give us a handle on examining how people grow in their domain of expertise in the workplace. Building on these ideas, design considerations for the Singapore work-study programme is discussed as it is a site where expertise is being developed and the confluence of the social roles and positions across timespace interactions, and the recognition of others in the identity positions enacted would all mediate the development and redevelopment of expertise. To this end, a suggestion of charting progress in the use of the three perspectives: the learner's view, how others view the learner, and the learner's reflection of one's own growth are also outlined in the chapter.

Keywords Identity development · Expertise · Work-study · Workplace learning

Introduction

In Chap. 1, Bound explicates the impetus of the roundtable discussions resulting in this book that focuses on the examination of learning from the adult learners' point-of-view. Learning here is not taken simply as a cognitive gain, it is the relations between personal identities and social others in continually evolving contexts. In this chapter, I like to focus on the notion of agency and identity, particularly in how learners' identity development can be operationalized to account for learning

R. Lim Wei Ying (✉)
Singapore University of Social Sciences, Singapore, Singapore
e-mail: rebekahlimwy@suss.edu.sg

H. Bound et al. (eds.), *Pedagogies for Future-Oriented Adult Learners*, Lifelong Learning Book Series 27, https://doi.org/10.1007/978-3-030-92867-4_8

towards expertise. Identity development is a complex, multi-dimensional, multi-timescale process which is difficult to unpack simply. For the purposes of this chapter, I propose three ways of operationalizing identity development: (1) relational constitution of self and other, (2) semiotic mediation of signs and symbols, and (3) recognition and recurrence, and in each I discuss the considerations for the Singapore work-study programme.

The Singapore work-study programme is a fairly new initiative, introduced in recent years with the intention of fostering closer education and industry collaboration. The impetus behind the collaboration is to create a seamless workplace-institution learning environment where the industrial experience and know-how is integrated with institutional knowledge for learning. Such a learning by doing approach, however, is not new and is akin to the age old apprenticeship model where the learning, doing and knowing are inseparable in the development process. Consequently, it has been argued e.g. Lave and Wenger (1991), that identity development may be a more productive lens or construct to view learning and development—an argument which I will unpack later in the chapter. Here, I wish to establish the link that given the apprenticeship basis of the work-study programmes, it is therefore appropriate to consider learning from an identity development lens, and hence, the discussion on considerations for the Singapore work-study programme in this chapter.

Then, in view of today's fast changing business landscape, it was a natural extension to consider the role of expertise in workplace of rapid changes. Since this is not the focus of the chapter, how instructors, institutions and organisations influence the development of identity was briefly discussed. Finally, to conclude the chapter, I reiterate the subjective nature of the learner and identity, and hence, the growth of experiences is intrinsically linked to emotions. While there may be programmes and structures in place to facilitate learning and identity development, the desire and motivation for expertise must ultimately come from the learner.

Power of Identity to Unpack Expertise Development

The notion of expertise is a well-researched construct in the field of adult learning, and the learning sciences. Take the learning sciences as an example, there are many known work such as cognitive apprenticeship (Collins et al., 1988), apprenticeship learning (Lave & Wenger, 1991), and expert-novice development (Bransford et al., 2000; Reimann & Markauskaite, 2018) that examine expertise and the development of expertise. In almost all of these work, identity is emphasized as the central construct in which learning, personhood, and skills mastery is built on.

One of the main reasons for the centrality of identity is that it is a productive construct transcending the psychoanalytical-social, intramental-intermental, cognitive-emotion dimensions, and thus, accounts well for the complexities inherent in human development. Scholars such as Gee (2001) and Sfard and Prusak (2005)

posit identity as an analytical tool for understanding life and social activity. Quoting Holland et al. (1998):

> Identity is a concept that figuratively combines the intimate or personal world with the collective space of cultural forms and social relations. We are interested in identities, the imagining of self in worlds of actions, as social products; indeed, we begin with the premises that identities as psychohistorical formations that develop over a person's lifetime, populating intimate terrain and motivating social life. Identities are the key means through which people care about and care for what is going on around them. They are important bases from which people create new activities, new worlds, and new ways of being. (p. 5)

Such a view of self combines the inner world with the external representations mediated in and through semiotic systems. In this view, identity is regarded as a dialectical process between self and social roles and positions, developed and maintained through relevant social interactions (Antaki & Widdicombe, 1998; Bakhtin, 1981). This view privileges the micro interactional moments as sites of identity construction, and reconciles the many and sometimes contradictory identity positions circulating at different timescales (Benwell & Stokoe, 2006; Lemke, 2008).

In other words, it is in the discursive realm that identities are brought into being. According to Gee, the larger culture ways of being exist in the form of Discourses with a capital D (2001). These Discourses afford and constrain people into certain identity positions in which the eventual achievement is dependent on the interactional dynamics, that is in the small d. Such a dynamic view of identity neither privileges the social cultural that identities are simply reproductions of the pre-existing social categories, nor the psychoanalytical where people are unproblematically agentive. It is about the discursive accomplishment achieved in-situ at the moment of interactional time (Antaki & Widdicombe, 1998; Benwell & Stokoe, 2006) and shows how the macros and micro aspects are inter-related.

The longer-term aspects of identity in this view require the coherence of performance as certain kinds over an extended period. It entails the issue of "thickening" (Holland & Lave, 2001) or "recurrence" (Lemke, 2008) where enactment of certain role positions and correspondingly recognition as such by social others were repeated. Similar to the discursive accomplishment of identities in micro moments, identities as "kinds" in the longer-term are not a disembodied and de-contextual process. We enact kinds through how identities are constituted in interaction. Likewise, change as certain kinds are themselves constituted through repeated enactments across many moments.

Separately, Lave and Wenger (1991) argued that expertise or "practice" in the context of community-of-practice (CoP) can be thought of as a way of life—a way of being that emphasizes on the "inherently socially negotiated character of meaning, and the interested, concerned character of thought and action of persons-in-activity" (p. 50–51). The development of expertise involves the knowing, thinking and doing of persons in context based on the situated negotiation and renegotiation of meanings in that particular context. On the other hand, these meanings are constantly being renegotiated and changed in the course of activity. Thus, it can be said that the

development of expertise is social and socially mediated through participation in a socially constituted world.

Mediation, in this case, is characterized by its own use of symbols, discourse, and even its own set of idiosyncrasies. To lead such a life involves the whole person being enculturated in some form of norms and practices; beginning with observing and practising in situ, leading to performance in accordance to the norms of a culture. Through such learning, the formation of personhood and expertise unique to the social situation will inevitably occur—one that evolves from the periphery to full participation in the community. This is the notion of legitimate peripheral participation (LPP).

The trajectory from novice to expertise in observation, practice to performance is similarly found in the five-stage model of adult skill acquisition (Dreyfus & Dreyfus, 2008; Dreyfus, 2004). Expertise development is not a mere accumulation of skills over time. The embodied self, as Dreyfus & Dreyfus explained, evolves from operating based on rules to one that is perspectival and involved, where decision-making becomes more intuitive and automatic. This process, according to them, involves interpretations and perceptions and that they are the attributes that make human learning different from machines.

So if the LPP or the five-stage adult skill acquisition model portray trajectories of development, then it can be said that the identity lens provide a productive handle in helping us unpack and understand the contours of the trajectory. Such a lens allow us to see what people care about, what affords and constrains them, how social meanings are interpreted, appropriated and subsequently changed. It also allows us to see how macrostructures inter-relate with micro interactional moments, and its influences on the outcomes of speech events and the longer term cultural events. In sum, identity allows us to unpack how people become who they are, and in the same vein, the expertise they acquire and the kind of expert they become.

Operationalizing Identity Development and Considerations for the Work-Study Programme

While the identity construct is productive and useful for unpacking how development towards expertise occurs, it is at the same time, elusive and hard to pin down from an analytical point-of-view. Because of the confluences of the multiple dimensions influencing identity and agency, there is no single unit of analysis that can be used in the examination or unpacking of identity. How then do we operationalize the study of the development of learning towards expertise? What counts and from whose perspective? In the following section, I propose three key tenets in how identity development can be operationalized. In tandem, I outline considerations for the Singapore work-study Programme; a workplace learning type of programme that attempts to recontextualize learning integrating the organisational expertise, institutional knowledge and the learner's desire for job, skills and development.

Relational Constitution of Self and Other

Unlike the notion of one being `born into an identity, the view of selfhood discussed here is not a presupposed given nor is it an unproblematic identification with the social. Identities acquire meanings analogous to other available positions in improvisational ways, sometimes nearly imitational, sometimes with great variability. In either case, identities as Bakhtin (1981) argues are not entirely created de novo, but appropriated as "rent" from available categorical positions.

So what makes other available categorical positions or otherness meaningful to oneself? Or put differently, which identity positions available is relevant? Among many conditions, Sfard and Prusak (2005) argue that depends on how significant the other is in relation to self—the more the significance, the higher the influence. For instance, Lim et al. (2011) showed how a beginning teacher was relationally constituted to be the technology kind by an expert other during the lesson study time. Others such as Davis and Harré (1990) argued from the line of power relations through "positioning" where people are afforded or constrained into certain identity positions by regimes of power. Regimes of power refer to rights, rules, duties and responsibilities associated with social positions in figured worlds.

In fact, philosophical works from Ricoeur (2002) and Vygotsky (1997) explained that one can only understand oneself through means of one's understanding of others. For instance, in the case of Nathan, Hung et al. (2011) described how a learner negotiates otherness in tandem with one's aspirations and goals. In other words, besides making sense of aspects of other categorical positions in relation to oneself, one is also concomitantly the other to oneself. We can only understand and view ourselves to the extent of how we understand and view of others. In this light, the relational constitution of self and other thus exists on two planes, the interpersonal and the intrapersonal.

Some key programmes under the SkillsFuture ambit that are gaining traction in recent years are the work-study programmes (https://www.skillsfuture.sg/workstudy). These programmes are designed for learners to experience learning both at the workplace as well as at the affiliated educational institution. Learners would typically be at work for some days in a week and spend the rest of the time in school. Learners are paid a salary, receive sponsorship for school fees, and they achieve a formal qualification at the end of the programme. These programmes can range from a year to 3 or 4 years depending on the type of qualification. In these programmes, the range of identity positions made available to learners for "rent" can be designed for. What are the powers of regimes along the lines of formal organisational hierarchy as well as the informal ones of the like of an influencer? Who the learners come in contact with, and how the power relations play out in each course of interaction will influence the extent learners appropriate the different identity positions made available to them.

As learners develop their competence towards expertise, the learning trajectory can be unpacked in three perspectives namely, the learner's view of how one is being influenced by the social others, social others' views of the learner and how the

process of becoming is being negotiated, and finally, the learner's reflection of own development in tandem with one's desire and aspiration. From an analytical standpoint, the combination of the three perspectives would provide a sense of the development in terms of progress, regression or even stasis. Moreover, taking into account the three perspectives could provide a concrete handle on the trajectory taken the learner by tracing the categorical positions taken.

Debrief or stocktake sessions could be organised for the expert practitioners and educators from both the organisation and institution. Together with the learner, these sessions could be the reflective spaces where deconstruction of learning can take place. That said, at the national level, these programmes are resource intensive requiring financial, manpower and effort commitment. It is difficult to achieve scale given the high cost upfront. In addition, the relational constitution of self and other is susceptible to manpower movements in that the dynamics of the apprenticeship will change when there is a change of expert practitioner or educator. These are realities that could limit the success of these programmes.

Semiotic Mediational Signs and Symbols

The semiotic mediation aspect of identity focuses on how one transacts signs and symbols towards others and reflexively onto oneself (Holland & Lachicotte, 2007). Signs and symbols acquire meanings through social acts, and they mediate people's sense of selves by providing the means for the organization and configuration of behaviour. Such transitivity of signs is what Holland and Lachicotte termed as "agency tools" (p. 116).

The process through which one transacts signs and symbols can partly be explained from the volitional aspects of oneself. The Meadian identity school of thought for instance attributes active internalization as the process where people develop senses of signs as they use them towards others and reflexively onto oneself (Mead, 1982). Mediated by personal meaning-making, growth lies in the conduct of the practice, that is, use of signs and symbols in language and/or actions and gradually grow into likeness of the other. Given this active internalisation process, signs and symbols do not remain unchanging. Through the art of improvisation by human agents, new tools can emerge as unique variants of existing ones.

Said differently, mediation from the cultural historical view will also entail personal engagement or motive (Edwards, 2012). The use of the signs and symbols in practice depends on the motive orientation of the learner. Motive is the driver and it gives meaning and purpose for how, when and why a task is accomplished. As involvement deepens, it is more difficult for the learner to retract, and hence, how learners make sense of the experience at this stage will determine how they progress in the later stages. Correspondingly, coaching and other means of support to support the learner will be useful here.

The work-study programmes can then consider structuring mechanisms or platforms such as using the life history approach (see also Salling Olesen's chapter in

this book) or learning biographies into the programmes. The learning biographies provide a space for learners to make sense of their journey at the intrapersonal level as they navigate through change. This is particularly crucial when experience at the workplace does not cohere with what learners learn in school, or that dissonance or anxieties that the learners themselves could not resolve. The learning biographies will provide a glimpse of the inner world of the learners' experiences as they navigate through the journey.

Moreover, organisations and institutions can play a greater role in helping learners to transact signs and symbols. Opportunities for the repeated use of signs and symbols with the intent of stabilizing utility could be designed for in the curriculum and enactment of the programmes. Often the practices of novice learners are emerging and fragile, and as such, it is important to have strategies that augment these emerging practices.

According to Lin and Bound (2011), there is a need to better support organisations in workplace learning where staff are given permission to "try new things". Another consideration is the extent learners who are also workers at the same time are allowed to tinker with the signs and symbols as they mature in their practice. Could there be structured time such as 'white space' where failing is more permissable? For instance, Lim (2013) found that a space for teachers to trial, enact, and rationalise forms a significant mechanism for the development of a teacher as a technology-using kind. The study also found that learners when given the time and space to enact and to rationalise are more able to grow into the likeness of the expert other.

Recognition and Recurrence

Besides the mediated organization of behavior, another significant aspect in the constitution of identity is recognition work done by others. Recognition work can be displayed both verbally and non-verbally. A display of recognition work orientates one to the ascribed role position as operative. According to Antaki and Widdicombe (1998), such recognition work is drawn from conventions of social categories and their associated features when indexed (here and now) and occasioned (produced) in interaction. The significance of the recognition work legitimized the local behavior and dialectically augmented the social practice in the social millieu.

Then how does each instantiation add up in the longer term? The longer term aspect of an identity kind is not determined by a single success. Similar to the way identities are constituted on a moment-to-moment basis, identities in the longer term are constituted and changed in the same way. The formation of typical or 'automatic' (Bourdieu, 1987) behavior (with occasional exceptions), thus is a function of the recurrence of opportunities and volition to enact those identities.

From a recognition work point-of-view, the role instructors (both educators and practitioners) play goes beyond being a subject-matter expert. Instructors mediate the identity development process by augmenting or impeding how learners make

sense of their experiences. To do so, instructors' lens of what counts as competent have to go beyond textbook knowledge and to view learners from a whole person perspective, considering their motivations and reflections. This is so that instructors can recognize the "category of difference" when enacted by learners. Such a change of role and intentionality may not be something traditional instructors are accustomed to. For instance, instructors may need to perform a more orienteering role. Orientations may include helping learners to explore challenges and aspirations, talking through choices and possible outcomes, and finally facilitate the formation of solutions. In addition, building confidence, providing advice may be included as well. As shown in Owen's chapter in this book, in the example of the air traffic controllers, instructors too have to undergo professional development, where their epistemology of learning have to be re-examined.

Besides relying on the instructors, there are other ways to recognize the identity development of the learners in the organisations and institutions. Learners in the work-study programmes embody a dual identity of learner and worker. Perhaps ladder-like progression such as from intern to full-time employee to confirmed staff can be milestones that learners cross in their work-study journey. Such forms of recognition not only commensurate with the maturation of expertise, they make relevant the identity work the learner undertakes.

For recurrence to take place, it will be advantages for the work-study programme to be supported financially and politically by relevant stakeholders. Having the buy-in from all relevant stakeholders is needful in order to have sufficient opportunities for recurrence to take place. Moreover, expertise development necessarily takes time. The ecosystem of work-study needs support as novice develops competencies into the job role. As Lim (2013) has shown, despite the structured lesson study programme being a year-long, there are limited opportunities for teachers to enact the technology-using kind of teacher.

In addition, the IdeA approach to curriculum design by the IAL (Bound & Choy, 2016) can also be seen as an enabler where the curriculum designer and facilitator of learning are empowered to review and adapt the curriculum to changing needs. Opportunities for recurrence can then be incorporated as the need arises.

Role of Expertise in Workplace of Rapid Changes

It is appropriate then at this juncture of the chapter to discuss what role expertise plays in workplaces where there is rapid change. Given today's globalised trade and network, business organisations are situated in fast changing contexts where agility and responsiveness are conditions for success. Given expertise development necessarily takes time, how then will this work out in workplaces where change is rapid? How do experts remain relevant, and how will people respond to changes?

The work-study programmes adopt a place-and-train approach, i.e. first place people in work positions and train them as they go along. This is in contrast with the more traditional approach where people are trained in higher education, and

subsequently seek jobs that befit their training. Both approaches are not without problems. However, between the two, I will argue that the work-study approach may be more responsive to change given that half of the learners' time is in the workplace, observing and perhaps participating in the changing landscape together with his/her co-workers. In this regard, the work-study curriculum will not remain static but very much responsive and relevant to the changing work context. However, there needs to be proper guidance and coaching of the supervisors at work and school, and for the learners to be resilient to make sense of the experiences.

In addition, expertise is continually made relevant as workers respond to changes in the workplace. In other words, expertise itself is and will be continually evolving. Thus, rather than to expect an individual to embody all the required expertise, interprofessional teams are the more plausible response to changes, problem solving and innovatation (see Edwards's chapter in this book). Specifically, it is the coming together of different forms of expertise that form the responses to change. By extension, some will argue that besides having different domain expertise, the coming together also entail a spectrum of technical and soft skills. In short, expertise may no longer be framed as an individual person but as a collective of a group of individuals whose expertise span a range of technical and soft skills.

If the work-study programmes are conceptually sound, at which school level should they be instituted? Different countries have different systems, and in each system, the transition from a broad-based curriculum to a specialised one occurs in different ages. Conceptually, I will argue that identity formation is lifelong and professional identity can be tinkered by learners in the early years of schooling. Practically speaking, I will posit that the work-study programmes can be introduced to learners as they transit from broad-based to specialised education where learners have a greater awareness of the different professions and their professional identities.

In fact, from a lifelong perspective, it is reasonable to assert that there is much interleaving between professional, personal, vocational and other identities. All life events, whether individual or social, are sites for identity construction and maintenance. While the emphasis of the work-study programmes is on professional identities, there is value in having learners participate in the larger society to do social good where their knowledge, perspectives and values are shaped, and reshaped. It is with the hope that through such experiences, it will be more clear to people who they are, and what they will become.

Concluding Thoughts: The Personal Desire for Expertise

It has been mooted in the literature that the connection between identity and emotion can no longer be dismissed (Lemke, 2008; Roth, 2007b). Emotion as a function of 'action' (Roth, 2007a, p. 162), provides the dimension to explain why we as human beings do what we do. Quoting Roth (2007a):

> The emotional dimension of performance is both driver and context for what we do. It is therefore integral to performance, to every instant of praxis, rather than being an external variable that can be added from the outside and after the fact. By noting its integrality I mean to highlight that it is a constitutive moment without which actual performances (and therefore cognition and consciousness) cannot be understood. (p. 168)

Following this line of argument, actions are orchestrated in the prospect that they satisfy certain needs or desire. Achieving them in tandem increases positive emotional valence and likewise can be said about negative outcomes and negative emotional valence. What constitutes as desirable or at-risk are therefore features of cultural values and beliefs. In a given culture (cf. Holland et al.'s 1998 figured world), there is a myriad of values and beliefs. Actions and therein volition are thus channelled towards those that appealed and avoided for those considered at-risk.

If Singapore's SkillsFuture Policy is about expertise and agency, then at some point, the policy will have to be perceived at the level of the individual learner. Learners are faced with many competing Discourses at the workplace, home front, aspirations, societal impacts, etc.. The confluence of these Discourses will influence learners and their desire for expertise in many different ways. For the learners, the decision as to what counts and to what extent, will not be a straight forward one. In order for one to embody expertise, the desire for expertise would have to be a compelling one.

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Associate Professor Lim Wei Ying, Rebekah, Singapore University of Social Sciences, Singapore

Lim Wei Ying, Rebekah is Associate Professor and Director of the Teaching & Learning Centre at the Singapore University of Social Sciences (SUSS). She leads the Centre in areas of academic development of lecturers, academic support for learners, and Scholarship of Teaching & Learning. Her research interests include professional identities, teacher learning and technology-enabled pedagogy; areas in which her research grant awards and publications are based on. Her other awards include the Hewlett Packard Innovation in IT in Education, Dean's commendation for research award, and the teaching excellence award 2011 & 2013. She has served as consultant to both local schools and international bodies, such as the Commonwealth of Learning, and more recently Southeast Asian Ministers of Education Organization, Southeast Asian Regional Centre for Graduate Study & Research in Agriculture (SEAMEO SERCA) in areas of professional development and technology-enabled learning.

Chapter 9
Dialogic Inquiry: A Pedagogy for Foregrounding Future-Oriented Learners and Their Learning

Helen Bound and Seng Chee Tan

Abstract Enabling individuals to thrive in and across contexts of dynamic change, suggests a need for a shift from a traditional focus on educator and content to dialogic processes of teaching and learning that bring a focus to learners and learning. If, as educators, we want to enable learners to thrive in uncertainty and change, and to contribute meaningfully to society, it is incumbent on us, as educators, to explore promising teaching and learning approaches like dialogic inquiry that position learners as (co) constructors of knowledge, as researchers of questions, issues or problems they have identified, as involved in making judgements about their work and the work of their peers, and agentic learners. Enabling learners in such ways is to facilitate the development of future-oriented learners who have a lifelong and life-wide capacity for learning.

In this Chapter, we use two case studies to examine how using a dialogic inquiry approach flips the lens from teaching to learning. Dialogical inquiry is a comparatively democratic approach that enables learners to develop deep understanding through knowledge building, works at the nexus of theory and practice, and contributes strongly to developing learning to learn capabilities and development of an identity as a learner. Notably, much of the literature in relation to dialogic inquiry is about school learners; this Chapter brings the focus to adult learners.

Keywords Dialogical inquiry · Learners · Learning teaching · Future-oriented · Knowledge building

H. Bound (✉)
Institute for Adult Learning, Singapore University of Social Sciences, Singapore, Singapore
e-mail: helen_bound@ial.edu.sg

S. C. Tan
National Institute of Education, Nanyang Technological University, Singapore, Singapore
e-mail: sengchee.tan@nie.edu.sg

H. Bound et al. (eds.), *Pedagogies for Future-Oriented Adult Learners*, Lifelong Learning Book Series 27, https://doi.org/10.1007/978-3-030-92867-4_9

Introduction

Enabling individuals to thrive in and across contexts of dynamic change, suggests a need for a shift from a traditional focus on educator and content to dialogic processes of teaching and learning that bring a focus to learners and learning. If, as educators, we want to enable learners to thrive in uncertainty and change, and to contribute meaningfully to society, it is incumbent on us, as educators, to explore promising teaching and learning approaches like dialogic inquiry that position learners as (co) constructors of knowledge, as researchers of questions, issues or problems they have identified, as involved in making judgements about their work and the work of their peers, and agentic learners. Enabling learners in such ways is to facilitate the development of future-oriented learners who have a life-long and life-wide capacity for learning.

Chapter 2 made reference to the dialogic inquiry approach that is the focus of this Chapter. In this Chapter, we address the core message in this book's title, "Flipping the lens from teaching to learning", by bringing a focus to learners' experience of the dialogic inquiry approach. In addition, we explore the changing roles and identities of learners and educators using this approach and how it contributes to the development of future-oriented learners. Dialogic inquiry is a comparatively democratic approach that enables learners to develop deep understanding through knowledge building, works at the nexus of theory and practice, and contributes strongly to developing learning to learn capabilities and development of an identity as a learner. When we use the term 'dialogic inquiry' we bring together a number of different strands in the literature from dialogic teaching and learning, inquiry processes and knowledge building. Dialogic inquiry goes beyond the confines of the classroom; it is an important pedagogical approach that can be used in any setting, such as work, community activity, and so on. Outside of the classroom, there may be less likelihood of intentional structuring, but the essence of participants exploring their own questions; seeking, providing and giving feedback; providing examples, reasons and evidence; and a democratic relationship can take place anywhere. Teams working on projects or solving problems in work settings, for example, will often exhibit these characteristics. Notably, much of the literature in relation to dialogic inquiry is about school learners; this Chapter brings the focus to adult learners.

In this Chapter, we use examples from a study of two examples of dialogic inquiry in two different Master's courses, one facilitated by AP Seng Chee Tan and the other by AP Helen Bound, at one Singapore University (see Bound et al., 2019). The 43 learners in these two courses constituted the sample of the study. Our purpose was to investigate how our learners developed an awareness of their inquiry processes and how they co-constructed knowledge. We also wanted to understand how our learners valued (or not) the dialogic inquiry approach. Collecting multiple forms of evidence from these two qualitative case studies over the time of each Master's course provided us with complex, rich and extensive data from learner interviews (conducted by our research assistant), observations, learners' concept maps, their scoring over time on their maps of dialogic inquiry (Stack & Bound,

2012), assessment items and curriculum documents. In getting these different forms of data to 'talk to each other', we initially analysed them separately, then set out to seek relationships between the findings, often revisiting the data to undertake different forms of analysis. For a full explanation, see Bound et al. (2019). One course focused on computer-supported collaborative learning and knowledge building (hereafter called CSCL&KB), which is offered to graduate learners who are school teachers, educators in institutes of higher education, or learning design professionals. The other Master's course (part of a different qualification) focused on workplace learning and performance (hereafter called WPL&P). WPL&P learners are from different sectors and professions, including teachers, team and division leads from enterprises in different industry sectors, human resource personnel, and learning and development consultants.

Following a brief introduction to the concepts of dialogic teaching and learning, inquiry processes and knowledge building, we examine learners' experience of dialogic inquiry, and a section discussing the tools for dialogic inquiry. This is followed by a consideration of the implications for educators, and the conclusion.

Dialogue, Inquiry and Knowledge Building

As the expression and building of meaning in dialogue is never complete, never closed and always oriented toward the future (Bakhtin, 1986), it is necessary to engage learners in meaning-making to facilitate their understanding of relevant bodies of knowledge, and in using the semiotic resources of these bodies of knowledge. Language, as a primary semiotic resource, takes time and practice to use in meaningful ways; "language is the essential condition of knowing, the process by which experience becomes knowledge" (Halliday, 1993, p. 94).

Language is a key tool for experience to become knowledge, and is the very basis of dialogue and inquiry in the knowledge building process. The process of inquiry can be specifically taught (Stack, 2007). Stack (2007) found that by asking four critical thinking questions in her physics classes, her 16 to 17- year old physics students moved from being educator dependent to owning the inquiry process themselves. When posing these four questions,[1] Stack used an experiential, problematising approach, asking students to apply the four questions to the explanations they and others arrived at when solving problems. In the process her students took responsibility for the inquiry process. Using data gathered from watching her

[1]
- Is it intelligible? (What further explanations or experiences can help me understand it?)
- Is it plausible? (How is it convincing, logical, relevant, trustworthy, fit into a bigger picture? What might be the flaws or limitations?)
- Is it useful? (How does it have greater explanatory or predictive power over other models? How does it fit into other ways of explaining the world? How is it significant?)
- Is it believable? (What are my underlying beliefs and values about the world and how do these new ideas interact with these?)

students use this process, Stack identified eight aspects of scientific inquiry that drew on and combined the four aspects from Kolb's learning model (experiencing, reflecting, theorising, applying) with Julia Atkin's integral learning model (detail, logic, holistic, feeling). All aspects need to be covered in cyclical learning processes to achieve integration of learning. An inquiry may range from posing questions and experimenting with possibilities to challenging long-held assumptions. Inquiry encounters difference and requires the development of a sense of being comfortable with difference (Bound, 2010). The eight aspects were developed into The Map of Dialogic Inquiry (Stack, 2007; Bound, 2010; Stack & Bound, 2012).

The *Map of Dialogic Inquiry* (see Fig. 9.1) is so called because it represents a valuing of dialogue and multiple perspectives to create meaning. The model is intended as a tool to help learners and educators be more aware of the different ways they learn, teach and inquire, enabling users to 'see' the different learning aspects when having inquiry conversations. Users might see themselves using two or more of these aspects simultaneously or oscillating between them, or moving through different aspects in a more structured way. It is not cyclical, but often people take well-trodden paths, avoiding areas they find difficult. "Good inquiry is likely to visit many places on the map" (Stack, 2012, p. 1). The Map is also useful for educators as they reflect and inquire into their approach to learning design (Bound, 2010). The Map of dialogic inquiry was used in the Master's courses referred to in the Introduction of this Chapter.

The process of dialogic inquiry is implicit in knowledge building. Knowledge building, in this Chapter, refers to knowing being achieved through participation in cultural practices and involving group processes in terms of improving the knowledge artefacts (objects) that capture the group learning. There are various 'tools' available to facilitate knowledge building, inquiry (inclusive of the collection & analysis of evidence) and dialogue, including technology-enabled tools such as Knowledge Forum (Scardamalia, 2004).

The key principles of knowledge building (Scardamalia & Scardamalai, 2010) are set out in Table 9.1, along with examples of approaches to guide learners. The participants are engaged in productive talk that is not simply agreeing, or confrontational, but exploratory in nature. Exploratory talk (Dawes et al., 2003) entails active listening, being critical and constructive to others' ideas, treating ideas as tentative and open to improvement, and aiming to collaborate rather than to compete (Walton & Macagno, 2007). Through exploratory talk, participants can build on one another's ideas towards idea improvement, rather than trying to win or to convince others to take a particular view. The process of idea improvement usually starts with a proposal of ideas, comparison of different ideas or clarification of ideas that leads to discussion among participants, and through productive discourse, improvement of ideas. It is a widening spiral as the process of collaborative inquiry usually triggers other new ideas and new questions that lead to further inquiry. Focusing on authentic ideas from the participants has the advantage of developing their epistemic agency, that is, participants take ownership of their knowledge building effort.

The following section of the chapter uses data from our study to explore learners' experience of the dialogic inquiry process in the two Masters' courses.

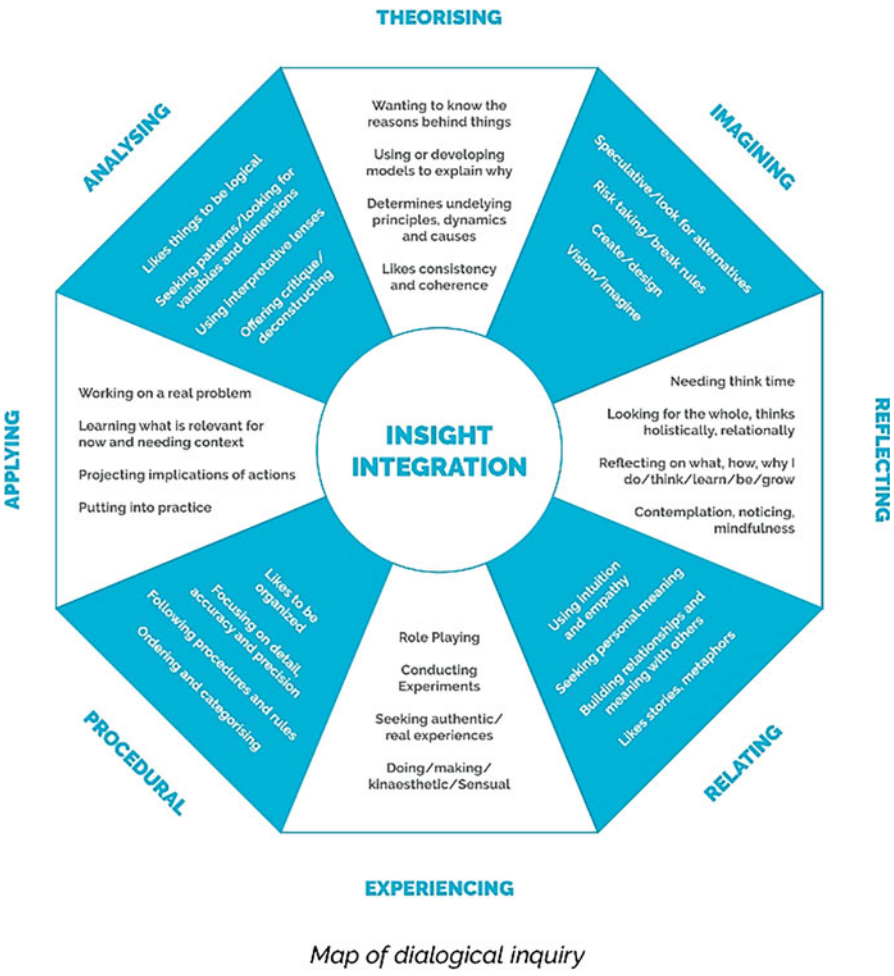

Fig. 9.1 Map of dialogic inquiry (Bound, 2010; Stack & Bound, 2012)

Table 9.1 Principles of knowledge building

Principles	Examples of initial approaches to guide learners
Idea-centric approach	
Real ideas, authentic problem	The learners were asked to use and compare affordances of different digital platforms in supporting collaborative learning.
The learners are engaged in inquiry related to authentic problems they encountered in their workplace or in their learning.	

(continued)

Table 9.1 (continued)

Principles	Examples of initial approaches to guide learners
Improvable ideas Learners learn to treat all ideas as improvable.	Suggest and discuss rules of discussion, respect and treat one another ideas and learn to appreciate the values of other's ideas.
Idea diversity Learners learn to appreciate and welcome ideas from different perspectives.	From the learners' discourse, show examples of different ideas and how different perspectives could enrich our understanding of a topic.
Rise above Building on idea diversity, integrate different ideas to achieve new understanding or to use higher level principles or theory in explanation.	Demonstrate integration of different ideas, for example, how seemingly different concepts of "constraints" and "affordances" are both contributing to collaborative learning.
Knowledge building practices	
Authoritative sources of knowledge Selecting relevant sources of knowledge (e.g., academic papers) and engage in meaning-making of the information to serve the inquiry.	Demonstrate productive use of resources with a critical lens. Show negative examples of simply sharing resources, sharing irrelevant resources, or quoting verbatim the information without understanding.
Knowledge-building discourse Use productive talks (active listening, building on one another's ideas) rather than competing to win an argument.	Provide instructions on the types of talk and from the learner's discourse, identify good examples of exploratory talks. Identify negative examples of simple agreement or simple disagreement without supporting reasons.
Transformative embedded assessment Integrate assessment as part of learning (assessment *for* learning and assessment *as* learning) in the knowledge building process; encourage self-assessment.	Discuss with learners to co-construct the assessment criteria. Use portfolio to record evidence of learning journey, reflection, and meaning making (e.g., concept mapping).
Symmetric knowledge advancement Recognise expertise of different learners and distributed leadership in advancing knowledge of the class	Learners take turn to lead discussion. Learners have the opportunity to initiate their inquiries even if they are different from the pre-planned themes given by the instructors.
Develop knowledge-building capacity	
Pervasive knowledge building Using knowledge building as a "habit of mind" that is applicable beyond the formal course.	Provide instructions on knowledge building principles and use these principles throughout the course. Encourage application in learners' workplace.
Democratizing knowledge Everyone has the rights to contribute to advancing knowledge of the class.	Highlight different learners' ideas and how they contribute to the discussion. Avoid favouring only a few learners.
Collective cognitive responsibility Everyone in the class has the responsibility of contributing to collective understanding.	Assessment criteria include contribution to the advancement of class' knowledge. Highlight examples of new ideas or resources contributed by the learners.
Epistemic agency Develop the ownership of learning and use epistemic criteria in knowledge building.	Assessment criteria encourage self-directedness in inquiry and meaning making. Provide examples of how to make credible claims based on evidence, theory or principles.

Learners' Experience of Dialogic Inquiry

Learners' experience of the dialogic inquiry process was varied; some learners relished the opportunity to be more in control of their learning, for others it was initially a confusing experience. Focusing on the learners' experience and capturing their voices in this process was important to the researchers in considering the value of this approach, and its use within a Singaporean context, that has a strong tradition of a focus on teacher, content and reproduction of knowledge. In this section, we specifically examine the struggles of shifting from being a passive to an active, agentic learner, the changes in role and responsibilities that were needed to make this shift. Also discussed are the processes of dialogic inquiry such as questioning, engaging with multiple perspectives and voices and last, the development of metacognitive capabilities.

Shifting from Passive Learner to Active Meaning-Maker and Knowledge Creator

It is noteworthy that in each of the courses, it was participants' first experience of dialogic inquiry. Many participants initially grappled with shifting from being a passive learner to being an active meaning–maker and knowledge creator. Working with multiple perspectives and developing their own stance was a new experience, compared to reproducing knowledge. Integrating theory and practice through working with authentic problems was another new experience, as was collecting and working with their own data and making judgements about their own and their peers' work. Holly, a participant in the WPL&P course commented that, "Not so much of a top-down approach. It's like the facilitators (of the course], they basically, they don't just come in and they start pouring information into our heads." (Holly, WPL&P). Melvin (WPL&P) similarly reflected that "for ... educators [in the previous courses and other programmes], they are a bit more direct. This is what you need to know, this is what you need to put in your assignment."

Shifting from a highly structured, educator centred approach, caused confusion for some:

> Like the last lesson [in week 3 of the course] that we had, unpacking some of the learning theories, I don't really understand what are we trying to drive at. But unpacking the learning theories, are we supposed to have a critical insight on what the theories meant? Or because different people will have different interpretations, is that the way or the approach that they want us to unpack, or should they tell us what they perceive this particular theory espoused and share with us? Yeah, so I don't know. I don't see much, yeah, helping us understand what the main theories espouse or the main focus. Or rather base it on our own interpretation, which I feel very confusing because many people, discussions, here and there but...leading here and there, but I don't know exactly...yeah, eventually what it leads to. (Doris, WPL&P)

Doris' frustration and confusion is in part a result of cognitive overload, not just with the content but with the contrast in expectations and role as a learner, compared to what she is familiar with. Suddenly she is required to actively make meaning, requiring that she shift her identity as a learner from that of a passive participant to an active agent. Her comment that, "I don't see much, yeah, helping us understand what the main theories *espouse* or the main focus" indicates that Doris is looking for a definitive answer, rather than expecting to engage in a process of interpretation and exploration of application. Not surprising then that she expresses confusion evidenced in her statement that, "Or rather base it on our own interpretation, which I feel very confusing because many people, discussions, here and there but. . .leading here and there, but I don't know exactly. . .yeah, eventually what it leads to." A small number of learners equated confusion with what they perceived as a lack of structure and direction. Doris took some time to feel comfortable with this different approach.

It takes exposure to and immersion in different kinds of practices to recognise different kinds of structures, roles and power relationships. For learners new to dialogic inquiry approaches, it is important for the educator to provide scaffolding and to intentionally hand over responsibility for learning to the learner as they establish different learning practices. Multiple occurrences of dialogue are important, allowing learners to progress their discourse so that they propose, explore and evaluate alternative ideas, explanations and problem solutions and, together, to construct the most satisfactory outcome of which they are capable (Wells, 2002).

Changes in Roles and Responsibilities

Part of the process of scaffolding the handing over of responsibility for learning to learners is to understand the different roles of learner and educator. In other words, the division of labour is different from more traditional approaches. Kathy (CSCL&KB), for example, notes that in these classes, "a lot of it is self-motivation, self-driven". A sense of ownership is part and parcel of self-directed learning, indicating that learners feel they have the right and the power to explore interpretations and develop ideas, "run the activities themselves" (Xavier, WPL&P) and determine "the depth want to pursue something, how deep you want to pursue something" (Quentin, CSCL&KB). This is in stark contrast to monologic approaches learners spoke about where educators give them meanings, interpretations, point out what is important so that it can be reproduced in examinations or academic essays. Melvin's (WPL&P) reflection that "there's no one idea I've got to subscribe to" marks both a shift in understanding his role as a learner and also a shift in power relations; he recognises that permission is given and he exercises his agency in developing his own opinion. He has a stance that is "a willingness to wonder, to ask questions and to attempt to answer those questions through the collection of relevant evidence by various means, both empirical and library-

based, and to present the findings to one's peers for critical review and improvement" (Wells, 2002, p. 33).

The Contribution of Dialogue and Questioning

Despite these challenges, through iterative opportunities of experiencing and knowledge building, the large majority of learners appreciated the value of the dialogic inquiry approach, deepened their knowledge and even changed their identities as learners.

Bernard captures some of the aspects that learners valued in the dialogic inquiry process.

> It definitely challenges us to think more about the issues that were presented to us and as compared to, you are doing it alone, it's like the acquisition metaphor. You do it alone, you try to think about it, you try to read books. But through participatory, in a group, the exchanges, the kind of views that we share and whether we agree or disagree, it actually helps us to really...how should I say? *Think about the questions, look at it from a different perspective* and try to also *understand from your peers their other angle* on the way they see the issues. And that actually expands our so-called *understanding of that particular issue* that we are talking about. Because without that, you will only have your own perceptions and your own understanding. With others' inputs, that *helps expand your ability to understand* the subject better. (Bernard, WPL&P course)

Learners commented that the many interactions both within groups and in whole-class discussions were "very enriching" (Holly, WPL&P), and "useful" (Susan, WPL&P) because of exposure to varied perspectives, sharing of experiences, ideas and questions. Ideas get "crystallised" (Melvin, WPL&P) through hearing different ideas and perspectives. One student commented that "sometimes when they ask questions or when they discuss, you actually can draw a different conclusion from what you usually thought. Yeah because sometimes you think it's only like that but it can be more" (Nathaniel, WPL&P).

This expansion of understanding of concepts and possibilities – "sometimes you think it's only like that but it can be more" – becomes a marker for shifts in beliefs, in the surfacing and naming of assumptions that may have confined understanding and applications. Dylan's comment (CSCL&KB) compares the dialogic approach with more traditional approaches.

> ... as compared to the more... traditional way, because you're hearing one voice, but now you're actually hearing a lot more voice(s)... you can hear different voices and where they are coming from. You may not always agree, or perhaps sometimes we may not even understand, but you at least should be aware...You hear more... things, rather than just from single point of view... Yes, sometimes, when particular group actually tried to start out the discussion, on affordances, they could actually branch out onto certain concepts on affordances, or give certain examples to integrate the concept, the principles of affordances, and these are things that I would not think of. (Dylan, CSCL&KB)

Iterative opportunities for dialogue enables development of confidence in posing questions and offering critique to improve and expand ideas and thinking.

Engaging with Multiple Perspectives

Dialogue triggered through engaging with different perspectives is important in deepening understanding. The multiple iterations enable deep understanding to evolve, as each iteration demands further exploration. Understanding evolves as patterns of internal mental dialogue transform, contributing to higher forms of cognition (Fernyhough, 2008). This restructuring of aspects of perspectives or orientation involves internal dialogue with self that has within it the voices of others (Bakhtin, 1986). Awareness of diverse perspectives "gives you an opportunity to explore those avenues, because you, maybe you didn't even think along those lines" (Sandra, CSCL&KB). This exposure to different ideas gives rise to "cognitive dissonance," prompting one to engage in "critical thinking" as compared to a monologic approach dominated by the educator's delivery of content (Diane, CSCL&KB). John (CSCL&KB) noted, "it's more than just about downloading of the content knowledge, it's a lot more about how you can piece other people's perspectives and then contextualize it with your own." Urijah (CSCL&KB) felt that sometimes after reading a paper individually several times, one can still "miss out certain things," but enlightenment could sometimes be attained from peer's explanations or interpretations.

Odell from the WPL&P course commented that, "I think that, I learn better when. . .when I. . .when I think about the idea first, and somebody starts talking about it. So it will get, in a way gives me a. . .a in a different perspective..". Different perspectives contribute to a restructuring of cognition to enable accommodation of multiple perspectives on a topic (Fernyhough, 2008). Odell also noted the importance of purposeful multiple occurrences of dialogue in order to build the ability to propose, explore and evaluate alternative ideas, explanations and problem solutions to construct a satisfactory outcome together (Scardamalia & Bereiter, 2014).

Multiple Authoritative Voices

Another difference in the division of labour between more monologic approaches (including some which claim to be more constructivist) is that the authoritative voice belongs not just to the educator, but is distributed amongst the readings, the educator, the learners, and enacted in the activities. Odell compares the dialogic and monologic (traditional) approaches.

> I would say you. . .for, for me it'll be very, you need to be very prepared when you come here. Whereas for conventional [the University] courses, you just go in with a blank slate of mind, you just say okay, here, let's say. . . [lecturer in earlier course in the Masters' programme] was talking about this, this, this. Let me go back and read more about this based on her understanding. (Odell, WPL&P)

Shifting from a monologic, didactic approach of teaching to dialogic inquiry requires important shifts in the division of labour between educator and participant.

The educator moves from positioning themselves as the only or major authoritative voice and the one who has the final word on the matter (it is their interpretation that will be looked to, to be reproduced in various ways in the assessment) to being a resource, a prompt, a facilitator and someone who supports the knowledge building process. For learners in the dialogic inquiry process, it requires a shift from being a passive recipient of knowledge from an authoritative voice(s) to being an active agent engaged in knowledge building, building language not only of the field of study but of the processes of negotiating meaning and inquiry.

Learners Development of Metacognitive Capabilities Through Taking Charge of Their Learning

When learners take responsibility for strategising the learning process, they have the opportunity to actively develop their meta-cognition capabilities. The development of meta-cognition in courses requiring reproduction of knowledge in one form or another is often low level (e.g. educators pointing out to learners what is 'important'), crafted by educators, to the point where learners do not develop these capabilities in the learning process. The need for learners to take charge of their own learning is inherent in the dialogic teaching and learning process and a critical future-oriented capability.

In our two courses, the development of learner's meta-cognitive capabilities was twinned with learners taking responsibility not just for their own learning, but for the development of the group. Nolan (CSCL&KB) noted that shared responsibility is critical, just like in the workplace, "you need to speak up if things are not right, or things should be in a certain direction." Diane (CSCL&KB) reflected that learning in such an environment, the accountability was in the learners' hands because they have to assume "shared responsibility" and learners know that they are "accountable to the other members in the community." Decision-making processes in the group are entwined with developing ideas and understanding. Odell (WPL&P) makes this point in a comparison between monologic and dialogic approaches:

> You can see more information coming from the peers, I find. Even more than the...I would say, than the usual courses [in the Master's programme]. Although there are, because the [programme] structure, from the way I see it, is I teach you, I tell you, A is, this is...this is what...direct instruction is about, this is how it is, who does it, okay let's have a case study, let's have group discussion to talk about this case study. Whereas over here [WPL&P], is about you share between your peers, and try to come to a *consensus* (author's emphasis) You get groups that are...tuned towards your workplace learning issue... (Odell, WPL&P)

Thomas shared the same opinion, recalling the changes and reflecting: "through this exercise of KB (knowledge building) you do a lot of self-reflection, you reflect on a lot of things then you share because you need to reflect before you put in the KB." These learners displayed conscious awareness of their evolving learning to learning capabilities. They were building tools for furthering the metacognitive

capabilities, such as the role of collaborative processes in knowledge building and inquiry and that they could be agentic in their learning.

Tools Enabling the Dialogic Inquiry Process

In this section, we will briefly examine a number of tools used for dialogic inquiry in these two masters courses. Specifically, we touch on the design of assessment, the Map of dialogic inquiry and the use of concept mapping that contributed to learners' deep understanding, their knowledge building, and their growing metacognitive awareness. Aligned assessment design can be both an external and internal motivator and driver of engagement.

Assessment Design

Before being specific about assessment design for dialogic inquiry, it is helpful to unpack a little of what we mean by assessment and how it differs from 'traditional' assessment that encourages reproduction of knowledge. Assessment and learning are integral to each other. Assessment is a tool to ensure the required standards are met. Assessment does and involves many things; it is,

> a process of making judgements; assessment is done with learners, not to or on learners. In making this point, we recognise learning not as a precise science, but as a process with intentional goals. Judgements are made over time from multiple sources based on multiple forms of evidence. Assessment draws on a diverse and multifaceted range of activities, systems and actors working within and across multiple contexts, which contribute to learners' constant process of 'becoming' – a process that never ends. Be it summative, formative or sustainable, assessment signals to learners what is valued, and it directs learners' attention and time to specific activities, concepts, values and principles that constitute "practice". In this way it can be seen as a core learning enabler or disabler, depending on how the assessment is designed, delivered and experienced (Bound et al., 2016, p. 10).

Formative and sustainable assessment (Boud, 2000) is a strong part of the design of each the two courses. Formative assessment is the assessment *for* and also *as* learning, not only *of* learning.

The assessment components used in the two courses included:

- What was assessed was consistent for all the particular cohort, and was aligned to the main purposes set by the instructors. But what was produced by each individual was a result of participants initiating and selecting their own inquiries, on topics that piqued their curiosity, or authentic issues in their workplace.
- Learners were assessed on how active they were in contributing ideas; in building on others' ideas; in helping to improve ideas; in demonstrating agency by

exploring new ideas, in making an epistemic contribution based on evidence, theory, or experience; in sharing useful resources relevant to the class discourse.

- A reflection piece was required as part of what was submitted. Their data points for their reflection included concept maps that evolved over time (individual and group) and the tracking of their evolving ways of thinking captured on the Map of dialogic inquiry. These contributed to a narrative of summative reflection that explains the main learning they develop from the course, any application of new ideas in their workplace, their experience in this class, and any changes to their views of learning through the course.
- Peer feedback as (non graded) formative assessment was a constant feature of these courses. This involved feedback on evolving ideas and as submissions for assessment evolved, the use of the assessment rubric for self and peer assessment. Rubrics provide transparency of what the standard of performance is, and such interaction with the rubric ensures learners become familiar with it. In the process learners are making judgements about their own and others work.

The design of formative and summative assessment is also what helps drive learners, as shared by Kathy:

> We get to check our own progress. Because . . . there's a function whereby we can assess and check ourselves, our own progress. Can also see. . . the various classmates who logged in, the exact timing. We can even see our own educators when he logged in, when or whether or not he read our posts and so on. So a lot of it is self-driven, self-assessment. Yeah so maybe what surprised me was the ability to assess and check myself. And also check fellow classmates whether they are doing the work. (Kathy, CSCL&KB)

Alignment of assessment purposes to the course is necessary in assessment design, in order to contribute to learner's meaning-making, their deep understanding and evolution of their identity as a learner. Authentic assessment is critical in achieving these outcomes.

The Map of Dialogic Inquiry as a Tool for Contributing to Metacognitive Capabilities

Throughout both these courses, the Map of Dialogic Inquiry was used by learners to capture their ways of thinking over the different sessions in the course. Clearly, an important factor in their rating for each time of entry (see Figs. 9.2 and 9.3) was mediated by the design and facilitation of the session. (This, by the way, makes it a useful tool for designers and facilitators to use as a tool for their own reflection purposes.) Not surprisingly, learners varied in how useful they found the Map of Dialogic Inquiry, but for the most part, learners found it useful to aid reflection, and to map their growth and development, contributing to their growing identity as active, self-directed learners.

The development of metacognitive awareness is evident in the following quotes. In his reflection, Ulysses (WPL&P) commented that:

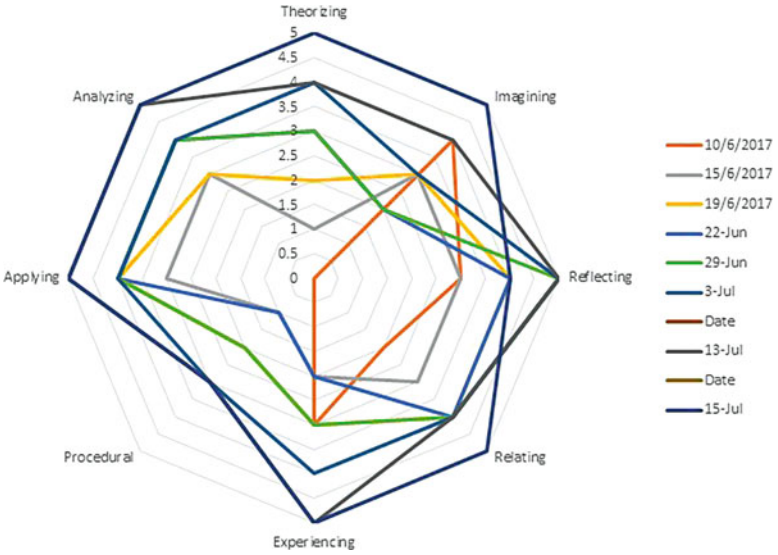

Fig. 9.2 Holly's map of inquiry (Bound et al., 2019)

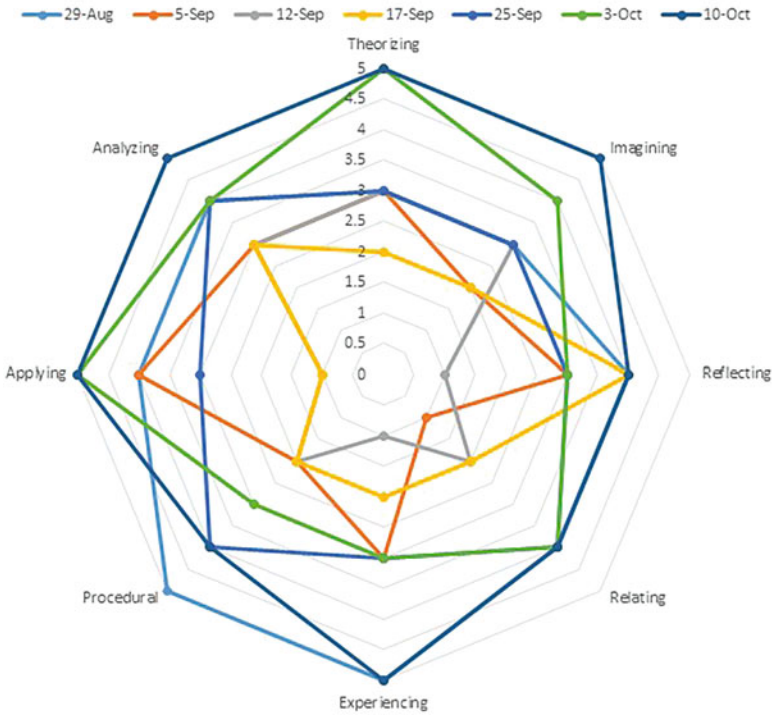

Fig. 9.3 Quentin's map of dialogic inquiry (Bound et al., 2019)

> Another interesting discovery of my learning journey is my inquiry learning method... I always thought that imagining is my key learning method. However, from the trend of my inquiry map, my learning style has changed from imagining to more applying, analysing and procedural in the later stage. This is a very good awareness call for me. Now, I know why I also have this repeated "frustrated and stuck" feeling when doing academic assignments. I always started with a lot of ideas but subsequently, I will do more analysing and start searching a model or a procedural way to complete the assignment. In the process of searching the model, I lost my imagery to be flexible and creativity in completing the assignments. Therefore, with this awareness, I will consciously apply more imagining learning style to take risk and be more creative in approaching my future assignments. (Ulysses, WPL&P)

As a result of using the Map of Dialogic Inquiry, Ulysses has a different way of approaching his assignments.

Holly noted her growing awareness of her ability to theorise, something she had thought she was not capable of. This awareness was developed through using the Map of Dialogic Inquiry (see Fig. 9.2).

> So it sort of expands you know, so I guess it's useful for my own reflection, my own progress. How I look at it, how I actually learned over time. And actually yeah I'm able to do that, you know be able to analyse and theorise, you know things like that based on what I have learned. The models or theories, being able to apply them. (Holly, WPL&P)

Holly's comment that "And actually yeah I'm able to do that, you know be able to analyse and theorise," is an expression of surprise. This was explicit in her tone of voice and of course in her map (Fig. 9.2). In her first few entries, theorising was low and for the first session was zero. However, over the time of the course, she became strong in these aspects, developing an awareness of herself as someone who does analyse and theorise, important for knowledge building. Such awareness is part of meta-cognition and a growing identity as a learner with particular strengths.

Awareness of what contributes to variation in scores was an important metacognitive realisation for Quentin and Dylan. Dylan shared that, "the growth of that particular domain stopped when the activities or the kind of discussions we had was actually shifted onto other forms" (Dylan, CSCL&KB). Quentin, likewise, shared that the inquiry process started again when a new topic was introduced and there was stronger inquiry during the weeks when the group was leading the discussion and class presentation. Quentin used the term "roller coaster" to describe the variation of inquiry scores over the weeks. To Quentin, the learning suffered when there were lower scores, reflecting lower level of inquiry:

> I think maybe I hazard a guess that the dialogic process when it works and it deepens, it deepens deeply. When the discussion was quite surface, and not enough people are contributing, it tends to also weaken, so that - those weeks reflected, to my inquiry, reflected those weeks where discussion, I felt wasn't as enriching. So it'll be lower. Therefore, some of my scores were lower as a result. (Quentin, CSCL&KB)

The quality of the dialogue is clearly important in developing deeper understanding and quality of ideas.

Using the Map of Dialogic Inquiry is a means of making visible to learners that which is normally invisible – their growth in different ways of thinking. This can be

a powerful contributor to a learner's confidence in their ability to learn and grow, and to extend into ways of thinking that they would not normally engage in (Bound, 2010).

Use of Concept Mapping

To aid knowledge building and also as a means of reflecting, analysing and theorising, concept maps were another tool used in both courses. Concept maps provide a visual representation of emerging ideas and relations between 'things'. This was important for learners in both courses. In his reflection, Ulysses wrote:

> It was a very interesting journey to me. [In the first concept map] I only understood that WPL consists of components such as 1) Various of WPL definitions, 2) Theories of WPL 3) Learning Environments 4) WPL tools 5) Evaluation of WPL. I could not see the connecting dots of these components. However, the turning point was when I was shown how some of these components were linked to the theories of WPL. That was when I started to think and reiterate the connections and application of these components (concept map 2). (Ulysses, WPL&P)

Concept mapping was a tool that contributed to linking theory with practice. Comparing his first and second concept map completed much later in the course, Bernard observed that "My earlier version clearly illustrated that while I have fragments of understanding here and there, the flow from one concept to another was highly confusing" (Bernard, WPL&P).To Quentin (CSCL&KB), the dialogic process provided learners with an avenue to "look from practice and see how it relates to theory and then deepen your understanding", rather than trying to read and thoroughly understand a theory before applying it.

The negotiation of meaning and co-construction of knowledge requires learners to see connections and relations between theories, concepts and evidence. The danger of loading learners up with a range of theories is that they may not see the connections and relations between them and thus find them difficult to apply.

The above sections have provided specific examples of learners' engagement with and experience of the dialogic inquiry process. But, how can these different ideas be understood cohesively? In the following section, the ideas evident in the discussion so far, are presented as a model.

The Model of Dialogic Inquiry

Overall, the learners deeply valued the dialogic teaching approach that afforded them the opportunity to clarify, question, interpret, and work with different kinds of evidence to co-construct knowledge amidst multiple perspectives and voices. Developing deep understanding was facilitated through curriculum design and structure that used authentic issues selected by individuals or groups of learners. In addition,

entwining the learning process with assessment (summative, formative and sustainable assessment) (Bound et al., 2016), modelling of processes required, scaffolding, the use of mini-lectures to provide initial ways of thinking about concepts and how to marry theory and practice were important in developing deep understanding. Paying attention to emergent and deepening meta-cognitive processes involved in dialogic inquiry and knowledge-co-construction processes was facilitated through the use of tools such as the Map of dialogic inquiry and concept mapping where learners could see changes and growth in their understandings and expansion in their ways of thinking over time. Importantly the changes in identity as learners is a powerful outcome that positions learners well for facing future, unknown challenges.

Pulling together the different aspects of all that has been discussed to this point, is the Model of Dialogic Inquiry (Fig. 9.4). The spiral in Fig. 9.4 illustrates the provision of multiple opportunities for learners to return iteratively to multiple instances of experiencing, information, and knowledge building.

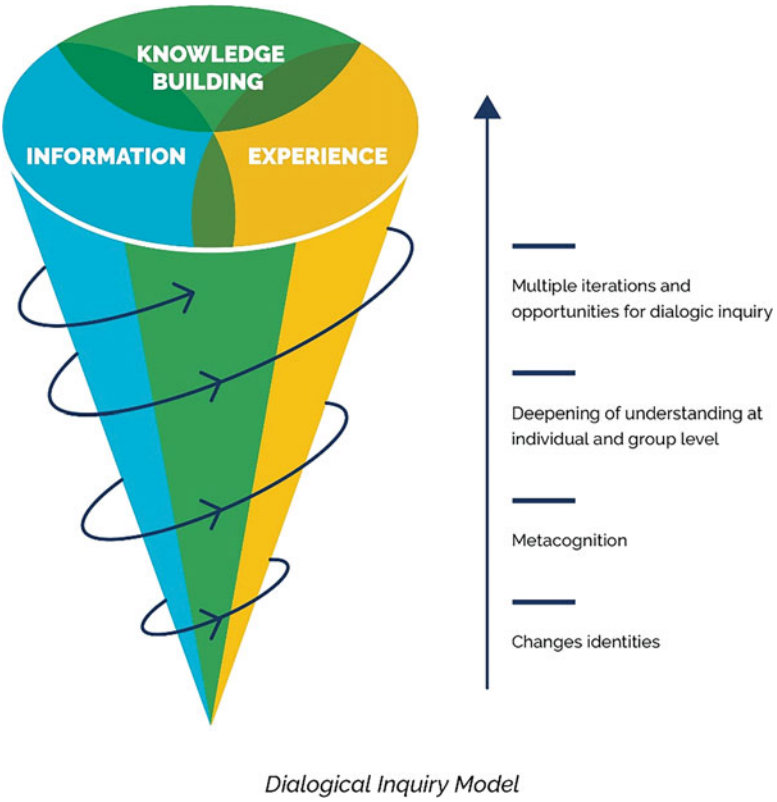

Fig. 9.4 Model of dialogic inquiry. (Adapted from Bound et al., 2019)

Implications for Educators

Challenges experienced by learners suggest it would be useful to make the structures more explicitly visible by pointing out these elements; for example, the flow of the curriculum, the knitting together of learning and assessment, the use of space, the collection of primary and/or secondary evidence, and so on. The need to apply theoretical constructs as learners worked with their authentic problems was perhaps one of the biggest challenges learners experienced. Explicit scaffolding is required to enable learners to marry theory and practice – something the educators paid specific attention to in subsequent runs of the same courses.

The confusion caused by exposure to engaging with multiple voices and perspectives indicates that this is not the norm for learners. As such, it is essential that educators are aware of the need to explicitly develop learners' capabilities for engaging with multiple voices and perspectives. This may include, understanding the stances of different voices and perspectives, developing critical questioning and evaluation strategies to interrogate different voices and perspectives.

Sustained experience of dialogic teaching is likely to reap benefits over time as the cognitive load decreases. This suggests that when programmes are planned and designed, such approaches need to be deliberately woven through the whole programme, rather than in individual courses.

Facilitating dialogic inquiry calls for a fine balancing act (see Tan & Ku, 2014), that includes making decisions about:

- Being the only 'voice' that structures the knowledge, compared to providing iterative opportunities for learners to take on this responsibility;
- The degree of scaffolding to provide
- Handing over control to and empowering learners yet retaining enough control

For example, if the issues of discussion are always prescribed by the educators, learners are distanced from the ideas. Wherever possible and feasible, issues need to be authentic and selected by the learners. Similarly, if educators have the final say on the issues discussed, learners often just wait for the final verdict instead of putting forth their ideas, contributing to a negative sense of learner agency. If the educator is the one who answers student questions, this can effectively silence the contributions of learners. Whereas, a simple technique such as throwing questions back to the group to consider, can contribute to capturing their attention and contributions.

The educator's beliefs about learning are critical to the success of using a dialogic inquiry approach. An acquisition (Sfard, 1998) model of learning where learners 'acquire' knowledge as a product, from the educator, positioning the educator as *the* source of knowledge, *the* authoritative voice will not enable the use of dialogic teaching. The dialogic teaching process implicitly understands learning as an iterative social process, involving access to multiple perspectives, and resources and empowering learners as authoritative voices. Perhaps the biggest concern for educators is the issue of power and the shift in roles of educator and learners required. By actively shifting power relations, and sharing power with our learners, educators

can learn to become comfortable as one of many contributing voices. When we are ultimately responsible for the final assessment decisions, dialogic inquiry requires a significant shift of power relations between educator and learners. Additionally, educators need to get comfortable with guiding learners following the *principles* of knowledge building, rather than following prescribed procedures for instructions. This requires constant assessment of learners' behaviours and their progress of inquiry, making decisions about how to steer them towards the productive path. Metaphorically, it is like a skilful driver who constantly judges the road and traffic conditions, gets information update from GPS, and decides which routes to take from Point A to Point B, rather than taking a predetermined route regardless of the situational conditions.

One approach an educator can take is, for each principle of knowledge building in Table 9.1, develop a suite of strategies and tactics that work under different situations. For example, using different strategies to elicit authentic problems from the learners (e.g., getting learners to talk about their experience, using a video clip that depicts a situation in a specific setting, sharing an article that presents a controversy). Over time, the educator can build up a repertoire of strategies that he/she can flexibly use. Alternatively, the course can be designed around learners' individual workplace problems as was the case in the WPL&P course.

The use of dialogic inquiry processes and knowledge building involves far more than including group processes that allow opportunities for learners to work together on a task. For example, learners use multiple sources of data (e.g. their own and their peer's experiences, the data they collected, the literature they read), learners share responsibility for reaching a form of consensus, the educator kinaesthetically (e.g. requiring learners to physically place and move themselves in the quadrants of integral theory) introduced learners to meta-frames of analysis, the educator consistently turned learner's questions back to the group, she probed for deeper thinking, naming of assumptions held, and so on.

In many ways the issue of belief in and trusting learners is a core tenet of dialogic teaching and learning; there is an expectation of active participation arising through the process of addressing authentic problems, the inquiry process and the co-construction of knowledge. Learners in the WPL&P course were told at the very beginning that they get out of the course what they put in, that as adults, decisions they made about levels of commitment and participation were theirs to make. This contrasted with learners' previous experience as shared by Olivia; learners were tested, *to check* on whether or not they had completed the reading. Such actions take away responsibility for learning from the learner and place it with the educator who uses external motivation to gain commitment. Such testing also inadvertently gives the message that what is required is a form of reproduction of the readings/required knowledge, rather than engaging in an active meaning-making process.

The perception of trust is underpinned by the educator's belief that it is important the learners make their own meaning, build their own understanding and deep knowledge. This belief also enables the educator to hand over power and control to learners in facilitating their own discussions. Bessie notes this responsibility for

facilitation of discussions where instead of discussion being "facilitated by the professor" (Bessie, CSCL&KB), learners facilitate their discussions.

Conclusion

Dialogic inquiry is a powerful approach for flipping the lens from content and educator to learners and learning. The approach draws on multiple traditions, including the humanist and social transformation traditions. The assumptions within the dialogic inquiry approach are that learners are agentic, strive to constantly make sense of their world and their experiences, that it takes a collective effort to improve ideas and develop people, and that learning is for social good. 'Social good' may range from development of deep expertise for work, to potential for change in and through work, community and society. Participants who take part in dialogic inquiry experiences often go on to implement change in their organisations or indeed in the industry sector, as was the case in the courses discussed in this Chapter. Developing future-oriented capabilities requires an openness that can be cultivated, an identity as a learner who is constantly growing to work in contexts in which they exercise their agency.

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Helen Bound (PhD), Institute for Adult Learning, Singapore University of Social Sciences, Singapore

Associate Professor Helen Bound is Deputy Director, Research and Innovation Division, Institute for Adult Learning. Helen's research interests focus on learning across a wide variety of contexts, including workplace learning, learning in high technology environments, professional learning and learning through collaborative activity. She is also interested in the contexts of learning and has published widely on a range of topics, including, learning spaces between classroom and work, specific pedagogical approaches and tools to support learning, competency development, professional development of continuing education/vocational teachers, workplace learning, and learning and development of non-permanent workers. Helen has a background in vocational training and education (University of Tasmania, Australia) and before that spent some years as a trade union trainer and running her own training and development business. Prior to that, her experience teaching in Australian secondary schools is the source of her deep interest in pedagogy and learning. Helen is a member of the Committee for Researching Work and Learning International Conference Series; has co-edited special editions of *Journal of Work and Learning*, is a member of the editorial and review boards for *Australian Journal of Adult Learning*; *Futuristic Implementation of Research in Education, and International Journal of Vocational Education and Training Research.* Her other books include *Towards a new understanding of workplace learning: The context of Singapore* and *How non-permanent workers learn and develop. Challenges and opportunities.*

Associate Professor Seng Chee Tan, National Institute of Education, Nanyang Technological University, Singapore

Dr Seng Chee TAN is the Associate Dean (Higher Degrees), Office of Graduate Studies and Professional Learning, National Institute of Education (NIE), Nanyang Technological University (NTU). He completed his PhD (Instructional Systems) from the Pennsylvania State University in 2000 under the NTU Overseas Graduate Scholarship. He has been working on integrating technologies into education in different positions, as an assistant director in the Ministry of Education, as

the Head of the Learning Sciences & Technologies academic group, and as the Acting co-director of the Centre for Research & Development in Learning at NTU. His research interests include Computer-Supported Collaborative Learning, knowledge building, and the use of technologies in education. His recent publications include “Knowledge Creation in Education”, “Pushing the frontier: A cohesive system-wide approach to integrating ICT into education”, and “Transforming teaching and learning in higher education.”

Chapter 10
Adult Learners' Sense-Making in Blended Learning Environments: Healthcare and Workplace Safety and Health (WSH)

Bi Xiaofang

Abstract Sense-making is understood as finding a way of thinking about diversity, complexity, uncertainties, ambiguities and incompleteness (Dervin B, J Knowl Manage 2:1–11, 1998). Building on Dervin's early work, educational (e.g., Harverly, Barton, Schwarz & Braaten, 2018) and organization studies (Weick K, Sense-making in organizations. Sage, Thousand Oaks, 1995; Weick KE, Sutcliffe KM, Obstfeld D, Organ Sci 16:409–421, 2005) argue that sense-making is a sociocultural and cognitive process by which students/teachers/workers in educational or organizational settings interactively and dialogically make meanings and plausible explanations of their collective experiences of uncertainties or ambiguities. This chapter explores how different sense-making features are distributed for individuals in two different blended learning courses. Additionally, I examine the impact of mediating factors, such as context, design and delivery of courses, on these learners' sense-making experiences in blended learning. The ethnographic study (Bi, Bound, Mohamed, Cai & Chuen, 2020) of six different courses by different training providers, which this Chapter refers to, was conducted in Singapore to investigate how adult learners experience and translate sense-making across different blended environments.

Keywords Sense-making · Blended learning · Curriculum design and delivery · Mediators

Introduction

Sense-making is understood as finding a way of thinking about diversity, complexity, uncertainties, ambiguities and incompleteness (Dervin, 1998). Building on Dervin's early work, educational (e.g., Harverly et al., 2018) and organization studies (Weick, 1995; Weick et al., 2005) argue that sense-making is a sociocultural

B. Xiaofang (✉)
Institute for Adult Learning, Singapore University of Social Sciences, Singapore, Singapore
e-mail: bi_xiaofang@ial.edu.sg

H. Bound et al. (eds.), *Pedagogies for Future-Oriented Adult Learners*, Lifelong Learning Book Series 27, https://doi.org/10.1007/978-3-030-92867-4_10

and cognitive process by which students/teachers/workers in educational or organizational settings interactively and dialogically make meanings and plausible explanations of their collective experiences of uncertainties or ambiguities. In educational settings researchers claim that sense-making is a process in which students co-construct their understanding of the world as they generate, use, and extend their ideas in the classroom (Maskiewicz & Winters, 2012).

In this chapter, I explore how different sense-making features are distributed for individuals in two different blended learning courses. Additionally, I examine the impact of mediating factors, such as context, design and delivery of courses, on these learners' sense-making experiences in blended learning. The ethnographic study (Bi et al., 2020) of six different courses by different training providers, which this Chapter refers to, was conducted in Singapore to investigate how adult learners experience and translate sense-making across different blended environments.

Sense-Making and Blended Learning

For the purposes of this Chapter, sense-making is conceptualised as a cognitive, socio-cultural process. In this section literature from organisational and management studies on sense-making is referred to, in addition to literature from education and the cognitive sciences.

Sense-making usually occurs when people encounter something that is abstract, confusing, uncertain or new (Malitis & Christianson, 2014; Weick et al., 2005). The process is described as ongoing; there is no stop and start point. The absence of a beginning (or end) in sense-making means that people may not always consciously make sense of things – they just do so, as events unfold within their experience (Weick et al., 2005). Dialogue and interaction are integral to collective sense-making (Maskiewicz & Winters, 2012; Weick et al., 2005), and serve as a springboard to action (Albolino et al., 2007).

Weick et al. (2005) identify features of sense-making as; noticing difference (resulting from, for example, feelings of uncertainty, that something is not quite right, new or abstract), followed by attempts at categorising and then labelling (naming) what is happening. The environment where sense-making takes place influences such processes, e.g., previous actions of self and others, protocols that 'need' to be followed, the culture of the organisation. Thus sense-making is distributed across the organisation systemically. The next question asked in the process of sense-making is 'what do I/we do now?' This is the action part of sense-making which is important in organizational sense-making; it involves talking with others; thus communication is central to sense-making as a social process. In sum, sense-making,

1. starts with organizing chaos, noticing and bracketing;
2. is about labelling and categorizing to stabilize the stream of experiences;
3. is retrospective;

4. connects abstract knowledge with the concrete instances;
5. is social and systemic;
6. is about organizing through communication; and
7. is about what actions to take. (Weick et al., 2005)

In turning to another body of literature related to learning, Vygotsky's work provides a useful linking, but somewhat different perspective from the work of Weick and others. Vygotsky's work was aimed at "generating an account of learning in which mind is making sense and externalising understandings by acting on the world using the tools available to change it for the better" (Edwards, 2010, p. 6). Action is mediated by the cultural resources in our environments (contexts). Language and thus communication, and action find some common ground with Weick et al. (2005) account of sense-making. Lave (1988) notes that cognition in every day practices is distributed over mind, body and settings. Researchers such as Lave and Edwards, highlight the mediation of cognitive processes. Weick et al.'s (2005) references to noticing, categorising, retrospectivity and so on, prompts questions such as, can cognitive theories provide further insights into sense-making? Kolb's experiential learning theory (1984) has been used in studies of high three organisations (see Chap. 7 this volume; Owen, 2009a, b, 2017), suggesting it may offer promising insights.

Kolb's classical experiential learning theory (1984) comprises four elements: experience, reflection, conceptualisation and experimentation; "engagement may move back and forth between processes such as reflection and experience (or any other parts of the experiential cycle)" (Owen, Chap. 7, this volume). There is considerable connection between the four elements and the processes of sense-making as listed from Weick et al.'s (2005) work. Ambiguity, confusion, uncertainty is a result of experience; reflection and conceptualisation are where individuals and collectives look back, recall, make comparisons to begin the process of naming, categorising, linking to what is known from their own experiences and from theory; and active experimentation is putting that meaning–making into action. This is seems that Kolb's elements of experiential learning theory can be readily linked to sense-making processes as outlined by Weick et al. (2005). Kolb's elements provide additional insights into the processes of sense-making listed above.

But there is more to sense-making that needs to be understood. As Edwards (2010) and Lave (1988) highlight, cognition is a socio-cultural process. Weick et al. (2005) identify culture and rules of an organisation in which sense-making occurs, naming this process as social and systemic, suggestive that sense-making is not just influenced by context, but mediated. Within any given context, the cultural, social and material both influence individual and collective sense-making, including actions which in turn influence the context/environment. In such ways is change affected in everyday activity.

The study (Bi et al., forthcoming) on which this chapter is based, took place in Singapore where the government agency responsible for workforce development, SkillsFuture, Singapore, was pushing forward an agenda to move from predominantly classroom-based delivery (Bound & Lin, 2011) to recognising and valuing

workplace learning and using technology as an enabler for learning in and across classroom and work environments. A recent policy development, iN.LEARN (2019[1]) emphasises the importance of promoting blended learning in Singapore's Continuing Education and Training (CET) (similar to Vocational Education and Training,) as a way to enhance learners' access to learning and to meet their dynamic learning needs for the purposes of development for and in work. Blended learning consists of any combination of two or more of classroom, tech-enabled, workplace learning spaces. In addition, to the ways in which these policies mediate use of technology, learning design and so on, such policy requires sense-making of its own by training providers, and adult educators, and is often experienced differently. In blended learning, there are many contextual factors that may mediate the sense-making process for learners; to name a few, the design of the curriculum and use of technologies (Bhatti & Kaur, 2010; Koponen et al., 2011; Scardamalia & Bereiter, 2010; Velada et al., 2007); and affordances in work environments, such as, organizational climate, peer and supervisor support (Bhatti et al., 2014; Cheng, 2000; Ng, 2013). However, we cannot assume that including tech-enabled learning and/or workplace learning will unproblematically lead to changes in pedagogical practices and improve learner's sense-making experiences. Such assumptions are misguided, as it is not the technological tools or different settings but changed beliefs, provision of institutional support and opportunity that have an important role to play in changing pedagogical practices and curriculum design to mediate learners' sense-making experiences. Therefore, a deep understanding of sense-making and how blended learning can enable effective sense-making is needed both theoretically and empirically.

This chapter aims to investigate the following questions:

1. What are adult learners' sense-making experiences in different blended learning courses?
2. How are different mediating factors working together for different sense-making experiences of adult learning in different blended learning courses?

Setting the Scene for the Chapter

The unit of analysis in the six semi-ethnographic case studies (Bi, et al., forthcoming), is learners' sense-making experiences in and across blended learning environments. Three to four individual learners (anonymised) from each course were invited to participate in the study. Semi-structured interviews, observations, asking participants to take photographs, analysis of relevant documents (e.g. curriculum and learning materials)–enables the capturing of rich data to understand learners' sense-making. Each learner was interviewed at least two or three times throughout their course. Researchers focused on seeking to understand how different environments,

[1] http://www.skillsfuture.sg/inlearn.

Table 10.1 Participants in the three selected courses

Industries/ courses		Learners	Adult educators	Curriculum designers	Workplace supervisors	No of interviews	No of participant observations
Healthcare	1	4	4	1	0	17	8
WSH	1	4	2	2	0	11	5
Total	2	8	6	3	0	28	13

tools and artefacts mediate the activity of sense-making as the learners progressed through their learning journey. To triangulate the data, adult educators, curriculum designers and where possible, workplace supervisors, were also interviewed for their perceptions of learners' sense-making in blended learning.

For this chapter, two blended learning courses from the original study, across two industry sectors (healthcare and maritime) were selected, as the comparison of these courses provide a rich description of the different impact of the mediating factors on learners' sense-making.

The Table 10.1 shows the number of different participants for the two selected courses; one from Healthcare and one from Workplace Safety and Health (WSH).

Adult Learners' Sense-Making Experiences of Different Blended Learning Courses

We found the seven features of sense-making identified in organizational studies (Weick et al., 2005) to be more nuanced in the setting of blended learning than the list provided earlier. Table 10.2 provides an explanation of each of the features evident in the data and how the researchers conceived of each feature.

The features of sense-making take place without any specific sequence or order. In different instances of sense-making, some features are more or less interrelated, more or less iterative, and some features may occur more frequently than the rest. For example, communicating tends to be interrelated with the rest of the features and is thus a relatively prevalent feature in the sense-making process. In the literature discussed above, action is an outcome of the sense-making process, and as in Kolb's elements, may result in repetitions of sense-making processes. It is therefore useful to capture frequency of different features, as captured in Figs. 10.1 and 10.2. These spider maps were generated by coding the observation and interview data to calculate the frequencies of different sense-making features evident in the data.

Table 10.2 Sense-making features reconfigured

S/N	Sense-making features	Explanation
1.	Noticing	A process of observing, identifying and experiencing similarities and differences across various situations, conditions and contexts
2.	Recalling	A process of recollecting, reconsidering and deliberating on past experiences
3.	Labelling	A process of grouping, comparing, naming and evaluating observed similarities and differences in knowledge learnt, conditions and contexts
4.	Connecting	A process of making efforts to link the theoretical and practical knowledge, individually or collectively
5.	Conceiving a systemic understanding	Developing ways of thinking to deepen understanding of aspects of professional concepts and practice within a wider context
6.	Communicating	Social and inter-personal processes to further understand what is learnt, e.g., asking questions, posing considerations, predicting, seeking clarifications
7.	Taking action	Iteratively translating/applying the sense-made, and reflecting

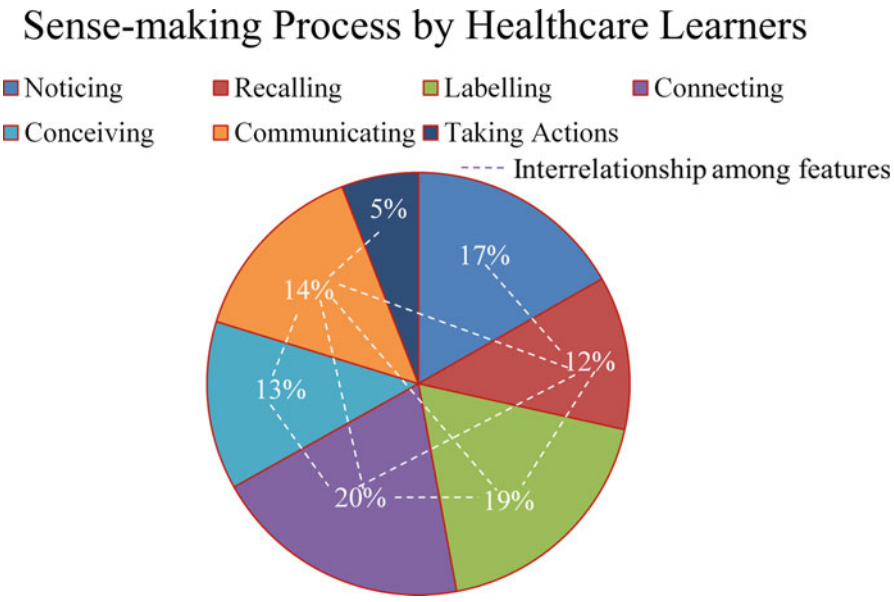

Fig. 10.1 Sense-making process by Healthcare Learners

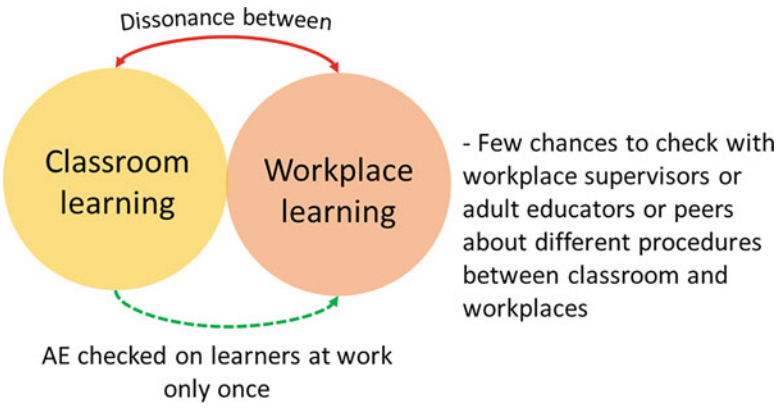

Fig. 10.2 Therapy assistant learners' fragmented experience of sense-making

Healthcare: Why Are Workplace Practices So Different from What I Learned in Classrooms?

The course in healthcare (therapy assistant) has a long tradition of using blended learning, namely classroom learning plus workplace learning. As shown in Fig. 10.2, noticing, labelling and connections are the most frequently occurring features used by learners, with communicating, conceiving and recalling still comparatively strong compared to action, It is this latter observation that is of particular interest, especially given that learners experienced a practicum, and that work settings are rich in potential for use of all aspects of sense-making. Although the available data of these learners' sense-making in their work settings was not as rich or extensive as that in classroom settings, learners' experience of the sudden jolt into a work setting, is telling.

In the spider figure, the red line represents learners use of sense-making features in the course. The dotted lines represent that some of different features occurred at the same time in adult learners' sense-making.

Through opportunities to discuss and practice using real props, these learners made connections (20%) between theory and practice. Conceiving systemic understanding of the industry and its practices was lower (13%) as opportunities for such conceiving systemic understanding were mainly through their adjunct adult educators (many of whom were also industry practitioners) sharing different scenarios and anecdotes from their clinical practice.

The dotted lines indicate features of sense making that were happening simultaneously. In Fig. 10.1, much of this activity involves the features of noticing, recalling, labelling and connecting. Interestingly, communicating does not appear with noticing or recalling. Learners were not required or given opportunity to share, or voice what they noticed, e.g. differences and similarities, which can enable connecting, Also given that props such as wheelchairs, beds and so on were used, the need for recall was less, as memories are embedded in these technologies (Säljö,

Chap. 4, this volume). The links between communicating, labelling and connecting were most powerful in the example of learners' sharing fried chicken over lunch, noticing the bones, labelling the different kinds of bones and fitting them together (connecting).

However, when learners entered the workplace attachment after the classroom learning, they experienced a stark disruption to their expectations – they were shocked at what they experienced. Their classroom and practice settings in the provider's premises, had not prepared them for professional practice, despite educator's sharing of anecdotes. In the classroom setting, Tony, for example, felt confident to make sense of patient's symptoms if he saw real patients. However, when he started his clinical attachment, there was a strong 'culture shock' between the expected practices and the reality of practices in the workplace. As shared by Tony, this culture shock pushes him to take more initiative in his sense-making as compared with that in classroom learning to force himself to get used to this full authentic setting. For example, he went online to search relevant information on how to work with other colleagues to take care of these patients in other similar settings. For Tony, the workplace demanded action, as illustrated in Fig. 10.2. As this study is the first to classify and account for the use of sense-making features in this way, there is little to compare findings with. However, it is likely that taking action will always be lower compared to other features, albeit that it provides powerful evidence of the use of other features of sense-making. However, the question remains, would this figure be higher if learners were provided with opportunities to take action? Action such as using the chicken bones to recall, label and connect, may seem small, but are indicative of useful potential learning activities – ideally with reproduced human bones. This activity also indicates the social nature of sense-making. The quote from Tony, was typical of this experience of disrupted expectations; expectations developed as a result of the design of the course.

> Yeah quite shocked. **There is actually a culture shock.** Because we went into the ward and then suddenly we see rows of wheelchairs with patients sitting on them and they were conducting exercise. So to us it's like "wow how come so many people and then only one person conducting?" So it was quite a shock to us. We thought was just go there maybe one to one or one to two person but this is really 40-50 people ah. . . . So after first week I think we got used to it because we got to listen to their life story. Yeah. So a lot of them are from various kind of background. Then we begin to understand how they ended up here. I think most of them are either dementia or Parkinson's disease or they have a stroke. Some are mentally not really sound. But they sometimes they talk sense and other times you ask them they talk things that are not relevant. So we begin to understand how they feel lah. (Tony, Learner from Therapy Course).

Tony indicates it took about 1 week to make sense of what was going on; communicating with patients was a key part of this process. Tony's experience illustrates the power and potential of including truly authentic experiences for learners. It also illustrates that the design of the course was somewhat fragmented, with limited linkage between classroom and practice sessions such as moving patients, and the realities of professional practice.

The culture shock experience was perhaps not surprising given the curriculum design decision to place the workplace attachment at the end of 2 months' classroom teaching – a common practice in the training and adult education sector. Unsurprisingly, learners expressed surprise that some techniques and procedures they learnt during the workplace attachment differed from what was covered during their classroom learning. Adult educators visited their learners once during the 4 weeks' clinical attachment. Learners were not required to return to the classroom after the attachment to gain or provide feedback on their workplace attachment. In addition, learners found that during the workplace attachment, there were few opportunities for them to check with their workplace supervisor about different techniques and procedures due to the workplace supervisor's busy working schedule. Figure 10.2 captures learners' experience in this course, as somewhat fragmented.

The curriculum structure was quite rigid and content was outdated. The Training Provider explained that he understood this as being a result of following what were perceived as strictly prescribed by the accreditation body for Workforce Skills Qualifications (WSQ) courses. Such courses use highly prescribed, task-based competency standards that, in this instance had not been updated in 10 years. The curriculum designer's efforts to improve the currency of the curriculum content by consulting with industry practitioners in response to the rapid evolvement of practices and technology in the healthcare industry amounted to little as such updates were perceived by the Training Provider as not allowed. Human Resource practices such as engaging adult educators as adjuncts (casuals), to teach in classrooms, added to the limited staff to support learners and their learning in the workplace. Funding is also a factor here, as funding for classroom delivery brings in greater funds than for other modes of delivery. Such factors partially explain the multiple 'culture shocks' experienced by learners. Importantly, these factors indicate system requirements, and perceptions of system requirements, along with common practices in the sector such as practicums always being placed at the end of institutional classroom training, that impact on sense-making and development of expertise.

WSH: I Feel Confident and Competent in Doing My Job!

The WSH (maritime) course offered a more seamless experience of sense-making for learners, blending classroom learning, tech-enabled learning and workplace learning. Again, curriculum design and pedagogical practices shaped by both Industry and Training and Adult Education contexts play an important role for the learners' sense-making experience. Learners in this course experienced deep sense-making. Deep sense-making refers to connecting and conceiving features of sense-making being more frequently present than the rest of the features. That means learners tend to be more involved in making connections between theory and practices, and between different aspects of professional concepts and practices in order to better develop their professional identity and position themselves for the specific job role.

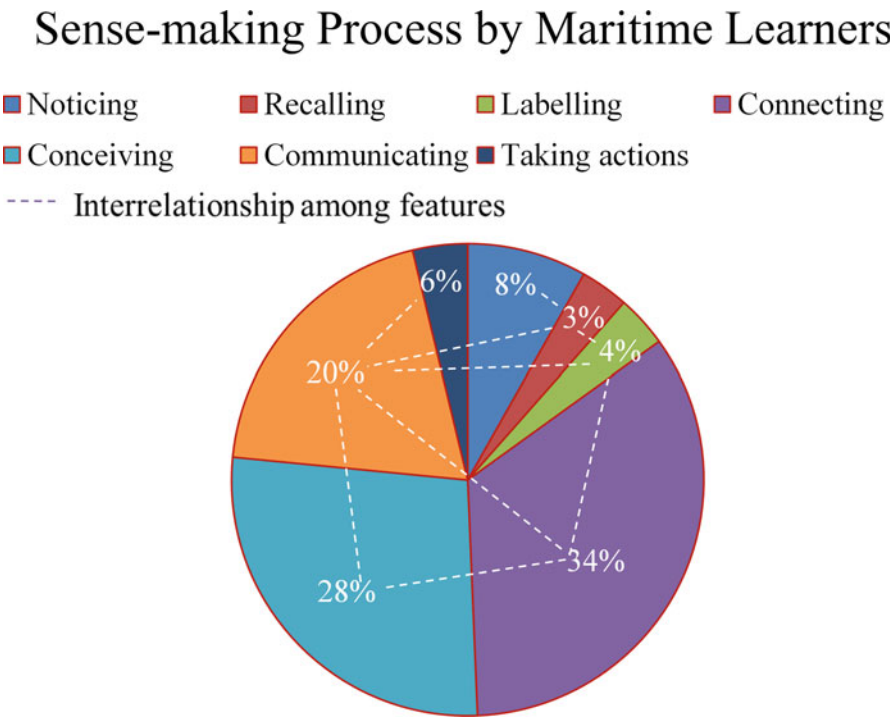

Fig. 10.3 Sense-making process by WSH Learners

Figure 10.3 shows that learners in WSH course received more opportunities than the health care students, to make connections between theory and practice and to conceive a more systemic understanding of the industry practice and job roles. Connecting (34%) and conceiving (28%) are considerably higher than in the health care course. As indicated by the dotted lines, in this course, communicating (20%,), is not only more frequent, compared to the healthcare course (14%), but in the WSH course, communicating is also more widely distributed amongst the different sense-making features. Unlike the healthcare course where the features of noticing, labelling and connecting were most frequent, in the WSH course, the features of connecting, conceiving and communicating were most frequent. This suggests that learners experienced different kinds of opportunities for sense making than their counterparts in the healthcare course.

For example, Aify, a learner from the WSH course comments on his experience with the simulator where he was given opportunities to take action and build systemic understanding of the work and profession.

> It's very… beneficial, because, during every simulator I will try to test the… my manoeuvring skill, because that's the only place you can play around with your telegraph, and your steering, your communication-wise, you also can order them. Because … in real life, as a master, you have to order them to do the steering, and also to do the telegraph. I mean telegraph is like a throttle. So, as a master, you just oversee everything, you just give

> them command, let's say, if you want to kick your, because we have to twin screw engine, port and starboard, starboard is right, port is left, and the propeller. So we just give command, let's say, 'Starboard engine, dead slow ahead', so, we just command, and they do..... They will, I mean, the deck hand, the [AVs] will do the telegraph and the steering, so in communication-wise, we also can train during simulator programme, so we can test the telegraph, so we know the characteristic of this propeller, the function of the propeller, the steering-wise, and you also can know how it respond. Because you rarely can do that during outside, because, because it's a job...Yes, they did. It develop me, I think I'm much more competent...The simulator sessions. (Aify, Learner from Maritime Course).

Aify is not the only learner from the Maritime course to share with us the benefits of the simulator session for navigating the vessels. At work, Aify may be given the opportunity to operate steering and telegraph, but rarely the chance to operate everything during navigation. Simulator experiences provide opportunities for practicing of different roles and functions in operating the vessel, helping these learners link theory and practice, and deepen understanding by developing a more systemic knowledge of the whole operating system. Aify commented that after the simulator session, he thinks he is much more competent in navigating a vessel. Fonzy shared that the simulator session prepared him well for the different scenarios in real workplace settings.

> Because, you will be onboard the ship every day, every day you'll be like, so-called, this, control the vessel, bring up the vessel, so having this simulator, is another advantage for me, because you...Experiential... experience, and you can like, justify yourself like, how do you encounter this kind of situation when you are onboard the ship.....So after the simulation, can you expect what will be like in your real workplace in navigating this vessel? Have you thought about it, like, if it's in the real scenario setting?..... (Fonzy, Learner from Maritime Course)

Fonzy is posing what if questions, connecting his safe experience in the simulator with the real thing. Such questions are precursors to action. He also comments on the holistic nature of the 'experience', implying that all the concerns, and emotions that go with the 'experience' are felt. These are also likely precursors to action. Besides experiencing simulated scenarios and practicing their skills in the process, learners were also brought to a real port to gain some hands-on experiences in using emergency equipment. Fonzy was able to link what he knew of his workplace practices and equipment with potential future unknown emergency challenges. He commented that understanding how rarely-used equipment such as emergency distress signals are used adds to a growing systemic understanding of safety and emergency processes. Learners' experience of sense-making is depicted in Fig. 10.4.

Quite a number of unique features in the design and delivery of this course contributed to the seamless sense-making experience of blended learning. The course developed its curriculum in collaboration with industry authorities to meet their requirements for job roles in the industry. The industry (Maritime Port Authority (MPA) and the International Maritime Organization (IMO) updates their requirements regularly with the training providers. Additionally, MPA participated in the assessment processes as part of their quality assurance processes.

The course sandwiched components of classroom and workplace learning. That is, the learners transit across the different learning environments back and forth.

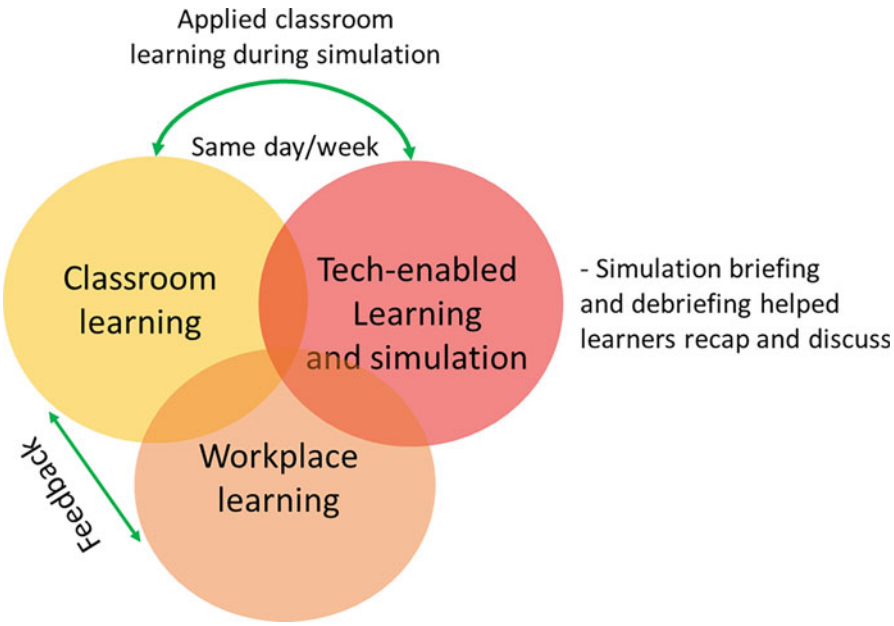

Fig. 10.4 WSH learners' seamless experience in blended learning

Between workplaces and classrooms, the adult educators' and workplace supervisors' frequently feedback to each other on learner's progress and performance. A bonus of this feedback loop beyond what the learners experience is that adult educators continuously improve and update the curriculum and facilitation.

The simulation sessions took place within 1 week of the classroom teaching of theories. Learners were briefed before this session to recap what they learnt earlier in the classroom. After completing the simulation session, the learners identified and addressed gaps or during a debrief session as set out in the curriculum.

During classroom teaching, the adult educators broaden the content by bringing their own working experiences from the field and encouraging learners to share among themselves different working experiences in their daily work. Such sharing deepens the learners' understanding of the links between theories and different scenarios of the workplace settings which will benefit their workplace learning.

Mediation of Sense-Making

As the examples illustrate, sense-making is not an individual activity happening solely in the minds of learners. It is apparent from the literature on sense-making and the data examined in this Chapter that sense making, is very much a social process, requiring access to opportunity to experiences that enable the use of all features of

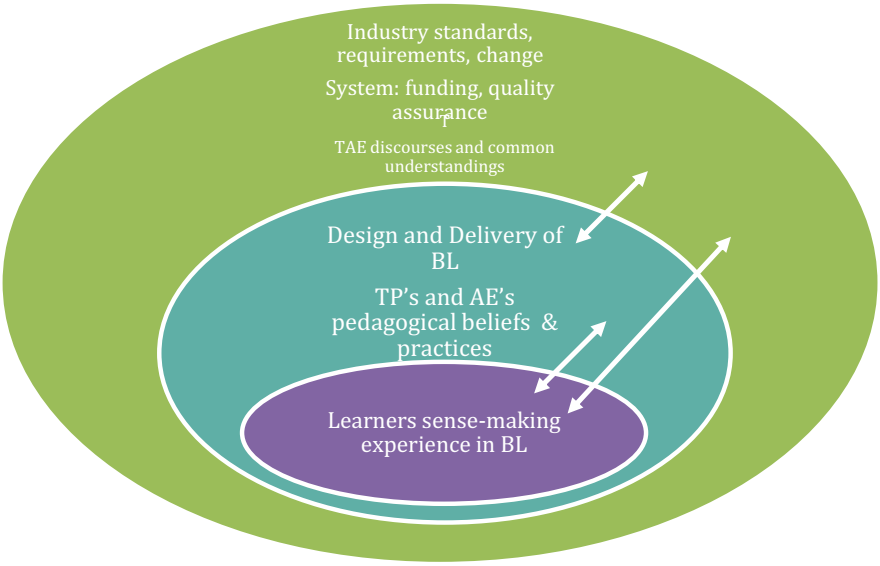

Fig. 10.5 The mediation of sense-making experiences

sense-making. The previous sections have focused on learners' sense-making, this section considers systemic issues in the ecosystem of Training and Adult Education (if you like it is sense-making of the ecosystem).

Figure 10.5 illustrates the dynamic interplay in the training and adult education field between learning/curriculum design and facilitation of learning, and specific system issues and discourses, that influence such opportunities. The nested ellipses in Fig. 10.5 and the arrows between them, represent: the interplay between learners' experiences and design and delivery (pedagogical practices) in blended learning, and the wider context of relations between training providers' interaction with industry. These interactions support or limit currency of practices and knowledge in a given industry, and system matters such as funding, accreditation and discourses in the training and adult education sector. None of the players are powerless in the face of system experiences. Tony, for example, showed considerable agency in his response to the 'culture shock' he experienced in the sudden shift from classroom to work spaces of learning. The maritime training provider and their educators were agentic in developing close relations with the industry sector – helped by the need for regulatory requirements. Implicitly however, this relationship mediated educators' practices whereby they remained current in their industry knowledge, providing opportunity for learners for authentic experiences enabling the use of all features of sense-making.

Adult educators are the executors in delivering and facilitating blended learning courses; as such they are an immediate influence of adult learners' sense-making experience. Appropriate design and pedagogical practices can make a difference. As revealed by the findings, learners tend to experience seamless sense-making when

they are offered more opportunities to share ideas, gain different perspectives from others and are exposed to different authentic workplace settings.

Likewise, training providers have important contributions to make in ensuring learners have access to opportunities to engage in all features of sense-making. Their work and relations with industry partners emerges as important for learners' seamless experience of sense-making in blended learning. As part of their everyday practices and inherent in their business models, it is argued here that training providers have a responsibility to ensure close working relations with their industry, use such relations as a means for continuous feedback and updating of courses, currency of staff industry expertise and to create supportive and meaningful experiences across different learning spaces of classroom, work, online, practice spaces and so on.

Conclusion

Given that sense-making is prompted by experiencing ambiguity, a dilemma, uncertainty and so on, the implications for curriculum and learning designers, and facilitators of learning seem obvious. Namely, that learners working with their own many experiences of unresolved ambiguities, uncertainties and so on, provides a clear starting point in the design of learning. Where this may not feasible, or not provide adequate challenge, then compiling complex authentic dilemmas and/or providing materials and problems that prompt engagement in all the features of sense-making is a ready alternative. The use of all features of sense-making is enhanced when work experiences or highly authentic experiences are integral to the curriculum. However, what may seem obvious may be the exception rather than common practice. While institutional and policy responses may look initially to the professional expertise of educators and curriculum designers to address the issue, it is necessary to look beyond the issue of professionalisation. As evidenced in the accounts provided in this Chapter, while curriculum and learning design and skilled facilitation can do much to address the opportunities for learners to use all features of sense-making there are clear system issues and prevailing discourses and perceptions in the training and adult education sector that limit such possibilities.

System limitations and funding structures strongly mediate the degree to which learners' sense-making is fragmented or relatively seamless. Seamlessness of sense-making is enhanced when learning experiences are authentic, when there is constant feedback from multiple sources (Bi et al., 2020; Bound & Chia, 2020), and of course when materials are current. However, when there is no requirement for regular updating of courses, and classroom funding is most prevalent, then private for profit training providers (the principle providers in Singapore) will respond accordingly. Discourses and common practices such as placing practicums or internships at the end of a course, impact negatively on design decisions; albeit that it does indeed result in uncertainty and a prompt for learners' sense-making. However, this represents lost opportunities for development of deeper learning and development of

expertise. An alternative is provision for iterative movement between different learning spaces (e.g. classroom, practice spaces, laboratories, online, work), but this would need to be supported across the system. Both private and public providers, are subject to sector discourses and quality assurance policies. At the time of writing the agency responsible for the training and adult education sector is putting in place reforms.

Despite system limitations, there are curriculum and learning designers and training providers who do operate in the liminal spaces enabling use of all features of sense-making as a seamless experience. In these ways, adult educators can challenge the system from within.

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Dr Bi Xiaofang (PhD) Senior Researcher, Institute for Adult Learning, Singapore University of Social Sciences, Singapore.

Xiao Fang is a Senior Researcher with the Institute for Adult Learning (IAL), Singapore University of Social Sciences. Her research interests include blended learning, workplace learning and skills development. Xiao Fang has a background in educational research on pedagogy and curriculum design. She has over ten years of experience in conducting both qualitative and quantitative educational research in both PET and CET sectors.

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H. Bound et al. (eds.), *Pedagogies for Future-Oriented Adult Learners*, Lifelong Learning Book Series 27, https://doi.org/10.1007/978-3-030-92867-4