Chapter 13
Conclusion: Conceptualizing and Innovating Education and Work with Networked Learning

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This book is focused on new ways of conceptualizing and innovating education and work through networked learning. The body of the book is structured into three main parts, each addressing a different aspect of the overall focus. The parts are: *Professional Learning*, consisting of three chapters; *Learning Networks' Development and Use of Digital Resources*, also with three chapters; and *Innovating Networked Learning*, including five chapters. A further chapter, preceding the main parts, presents an overview of the way the term 'networked learning' has been used in papers presented at the International Conference on Networked Learning (NLC) since the early conferences. In this way, the chapter works to set the stage for the contemporary discussions of networked learning in the main parts.

In this final chapter, we articulate a set of themes emerging from the book's chapters as issues to be investigated in the future. In the first section, we present a summary of the main points made in each of the individual chapters. This serves both as a guide for the reader interested in specific aspects of networked learning and as a basis for our identification of emerging themes. In the second section, we highlight these emerging themes, focusing on *design for collaboration in networked*

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learning; complexity of online networked learning in physically located environments; *the nature of learning and cognition*; and *politics and ethics in networked learning*.

13.1 Summaries of Issues and Perspectives in the Chapters

13.1.1 Intro

The book's first chapter is *Tracing the Definition of Networked Learning in Networked Learning Research* by Murat Öztok. It serves as an intro to the book—and to the field of networked learning research—as it provides a qualitative outline of how the term 'networked learning' has been used by participants at NLC over the years. Öztok constructs the outline through a discourse analysis of all papers explicitly using the term in the conference proceedings from 2004 to 2018 (266 papers out of 412). The analysis finds anchorage in the initial definition of networked learning put forward by Goodyear et al. (2004); in particular in the role which this definition accords to the three concepts of *technology*, *connections* and *network*. Öztok highlights that networked learning researchers consistently approach technology as a means for mediating connections (rather than something to be used for its own sake), that connections are, in general, theorized from a range of socioculturally inspired learning theories, and that, consistent with this, the overwhelmingly majority of papers associate 'network' with community. Öztok points to areas which he finds underdeveloped in the papers, such as the conceptualization of learning and alternative frameworks for understanding what networks are. He proceeds to discuss the recent revised definition of networked learning advanced by the Networked Learning Editorial Collective (2020). He argues that the definition, though providing clarity on a number of counts, still bypasses the fundamental questions of what learning is and what networks are and fails to adequately reference social justice and equity issues. Similarly, he points to ways in which the remaining chapters in the present book provide new perspectives on the central concepts of technology, connections and network. The chapter is a valuable contribution to the book's overarching theme of *conceptualizing education and work with networked learning*, both for the overview it provides of past and present understandings of networked learning, and for its articulation of questions that are still not answered, despite their significance for the design of appropriate networked learning possibilities.

13.1.2 Professional Learning

Part 1 addresses the book's overarching theme of *conceptualizing and innovating education and work with networked learning* within the area of professional learning. The focus is on the facilitation of educators' professional learning, and—

through this—on the resulting possibilities for development of educational programmes. The three chapters thus provide insights on innovating education in a dual perspective: They take on the issue of designing for learning at the secondary and tertiary level (where the educators teach) in the context of the educators' innovative work on developing designs.

The Part opens with a chapter authored by Daniela Gachago, Jolanda Morkel, Izak van Zyl and Eunice Ivala, *From Design Thinking to Design Doing: Experiences from an Academic Staff Development Programme for Blended Course Design*. The authors' reflection on how to promote a design thinking approach during a professional development course for university lecturers on blended learning leads them to key insights for networked learning. They argue that design thinking promotes problem-solving and interdisciplinary collaboration aimed at tackling complex or wicked problems. This approach is explored as an alternative to professional development often driven by supply-based solutions during one-off seminars taught in a one-size-fits-all manner. The authors report a positive reception of the course by their participants who engaged actively in blended course design and experimentation in a playful manner. The study also uncovered several concerns, one of which was the tension between development of creative agency and direct application in practice. This finding emphasized the need for creating a safe place for experimentation and collaboration. The chapter is significant for networked learning, both in providing a concrete example of a design thinking approach within professional learning and in pointing out the concerns of trust and creativity which will be relevant to innovative educational formats in general.

The second chapter is focused on *Designing for Boundary Crossing and ICT-Based Boundary Objects in Dual VET*. In this chapter, Marianne Riis and Anna Brodersen explore teachers' use of ICT as mediating artefacts for boundary crossing activities in the context of Danish Vocational Education and Training (VET). They argue that networked learning is a relevant perspective when promoting connections between learning at school and the workplace. Yet knowledge of pedagogical use of ICT in this context is limited. Riis and Brodersen used interviews and design workshops to explore and refine a design model to facilitate teachers' planning for boundary crossing. They found that the teachers use a range of ICTs, but that their potential for boundary crossing is not fully utilized. The participating teachers perceived the design model as useful, but traditional transfer-based pedagogies seemed to dominate their thinking. Teachers further expressed a need to know more about ICT and its affordances for boundary crossing. The chapter contributes to networked learning research in conceptualizing networked learning's potential in boundary crossing and transfer as well as highlighting hindrances in practice as regards realizing this potential.

No Size Fits All: Design Considerations for Networked Professional Development in Higher Education is the third chapter in this Part, written by Nicola Pallitt, Daniela Gachago and Maha Bali. In this chapter, the authors develop a framework of design considerations that can be used to analyse, contrast and design networked professional development in the context of higher education. A networked perspective is used to focus on relationships and collaboration while promoting openness,

learner collaboration, and self-directed and authentic learning as part of professional development. Reflecting on their own practices as academic developers, the authors challenge the one-size-fits-all approach, often at play in practice if not in theory, in professional development. Instead, they promote recognition of disciplinary and institutional contexts. Their research leads them to identify three main tensions (advocacy and usefulness; choice and agency vs. institutional expectations and rules; and certification, volunteerism and unpaid labour), which they discuss. These tensions are important to take note of in educational design for networked learning in general, as are the chapter's insights on the dimensions of course design and the considerations applying to each of them.

Overall, design thinking and doing emerge as a central theme in this section on professional learning. Rather than providing a professional development course focused on the delivery of content, the chapters advocate an active learning pedagogy based around notions of design. The design approach is a way to actively engage professionals in developing their own practices with a focus on developing agency and ownership rather than following strict institutional expectations or rules (Pallitt et al., Chap. 4). Such a design approach helps to keep professional learning authentic and centred around issues experienced by practitioners in their practices. The networked approach supports professional learning in being collaborative and fosters a culture of community learning and identity development through a process of becoming (Riis and Brodersen, Chap. 3). It was found that this process is best served in a safe and playful environment combined with the need to develop skills to foster creative agency (Gachago et al., Chap. 2).

13.1.3 Learning Networks' Development and Use of Digital Resources

The book's overall theme of *conceptualizing and innovating education and work with networked learning* is concretized in Part 2 for learning networks, with a focus on collaboration on the development and use of digital resources. The long-term aim of the collaboration is facilitation of learning and empowerment for the target group of the resulting digital resources. Between them, the chapters investigate learning networks in work within a single institution, across several institutions, and outside the formal educational system.

In their chapter *Investigating Teachers' Use of Educational Tools as a Collaborative Space for Networked Learning*, Morten Winther Bülow and Rikke Toft Nørgård present a study on teachers' planning and remix practices as regards creating educational materials with the use of an educational tool, CourseBuilder. Teachers' planning practices are design practices, what Goodyear (2015) called *preactive teaching*. This engages a planning mode of thought where tools and methods are put into action to create designable things such as educational materials. Bülow and Nørgård argue that participating in the collaborative design space of

CourseBuilder provides teachers with opportunities of (1) shaping their own teaching practices, (2) producing reflective, meaningful and valid educational materials, while (3) being supported in their professional development and reflection. However, the case study showed that the collaborative design space did not in itself sufficiently support teachers in changing their collaborative course planning patterns. The chapter points out that it is not enough to offer tools and opportunities for collaboration; it is necessary to develop frameworks that support collaboration at a deeper level. This, in turn, requires a better theoretical understanding of how and why teachers collaborate as regards educational materials and how this can be utilized to develop a meaningful collaborative design space. The study is significant for Networked Learning in that it investigates teacher's collaboration on knowledge construction of course planning in a networked learning community. It shows the potentials of networked course design. Furthermore, the teachers' participation led to an evaluation of a specific learning tool and learning environment as potentially supportive of networked learning.

The chapter by Ann Hill Duin, Isabel Pedersen and Jason Tham, *Building Digital Literacy Through Exploration and Curation of Emerging Technologies: A Networked Learning Collaborative* is a study of the use of the repository *Fabric of digital life* in relation to instructor discussion, instructional development and students' building of digital literacy. The *Fabric of digital life* tracks the emergence of embodied computing platforms and is both a collection of emergent technologies and a learning database with instructional resources with the aim of supporting students in developing digital literacy. The background for the development of the repository is the recognition of a large gap in students' digital literacy: Despite consuming a growing range of technologies, students appear unaware of their lack of control over the impact that networking, devices, data, and processes have on their lives. This gap is addressed through the project *Building digital literacy* which is a networked learning collaboration utilizing the *Fabric of digital life*. The chapter reports on the process of building the *Community for collective intention* with instructors and research assistants from different universities together with archivists and editors from the Fabric. This Community aims to foster instructional development and to promote connections between people, sites and contexts. The chapter's relevance for Networked Learning can be seen from both a learning perspective and a development perspective. From a learning perspective, students can benefit from interacting with the collections of immersive technologies as a means to building digital literacy. From a development perspective, instructors and researchers worked together to design resources in order to shape student journeys in learning.

Lucila Carvalho, Pippa Yeoman and Júlia Carvalho present a study of the learning network *Fast Food da Politica* in their chapter: *It's Your Turn! Supporting Social Change Through Networked Learning and Game Playing*. The network is a non-profit Brazilian organization designed to promote social action in Brazil, focusing on empowering people to take hold of their own futures. The network is inspired by Freire's pedagogy and aims to educate people to practice freedom and, in particular, to participate in their life practices in ways that contribute to transforming their own world for the better. The goal is to engage people in conversations about

political systems and thus to deal critically with reality. The case study examines the organization as a learning network at three levels: its strategic vision (meso level) supported by specific social arrangements and fun game tasks (micro level) to address the social, political and economic situation of Brazil (macro level). The game tasks of the learning network concern the mechanisms of the Brazilian political system and are designed to bring many different people together to play, discuss and learn. The focus of the case study is understanding how the games support people's engagement in learning. The relevance to Networked Learning is twofold. First, the chapter investigates a learning network based on networked learning values of participation, co-creation and knowledge building. Here, the study offers insights on how game elements support participation within the learning network. Second, the chapter utilizes the analytical framework of Activity-Centred Analysis and Design (Goodyear & Carvalho, 2014) which identifies key structural elements in a learning network, to explore how this particular learning network operates and how the different design elements align in practice.

13.1.4 Innovating Networked Learning

Part 3 contributes to the book's overall focus on *conceptualizing and innovating education and work with networked learning* through a focus on how networked learning itself can be innovated and (re)conceptualized within education and work. The Part progresses from investigations of specific new technology-mediated educational formats to the development of more general perspectives on networked learning. The latter centres on novel conceptualizations of the learning process, while also addressing the implications which these conceptualizations hold for innovating networked learning.

The first chapter in Part 3 is *Networked Practice Inquiry: A Small Window on the Students' Viewpoint* by Maria Cutajar. The chapter reports findings from a small-scale study of students attending the course *The digital dimension of community action and development* which was part of an encompassing Master level study programme. The course adopted a Networked Practice Inquiry approach as its pedagogical foundation with the intention of leading students away from traditional face-to-face lecturing towards more activity oriented networked learning. This was undertaken with the hope of motivating students to adopt an exploratory attitude for constructing and developing disciplinary knowledge. Two students' lived experiences were subsequently studied through an interpretative approach leading to insights into tensions experienced by the students. On the one hand, students were motivated by critically analysing, reflecting and rethinking aspects of their work and life and saw a value in group tasks and peer learning interactions. However, they were also overwhelmed by the demands and pointed to the pressure, stress and wariness peer interactions can create. Further, they felt vulnerable and uneasy about having to share thoughts and enter into dialogue with others, in accommodation to the explicit aspirations of the course's pedagogical underpinnings. The chapter is an

interesting extension of Cutajar's previous work (Cutajar, 2018) and raises issues also pointed out by Hodgson and Reynolds (2005) and Perriton and Reynolds (2014) concerning how pedagogical demands or requirements around openness, dialogue, sharing and collaboration do not always sit comfortably with students, i.e. students may feel unfamiliar with and disturbed by a networked learning pedagogy. Thus, the chapter contributes to networked learning research by exploring also the flip-side or the darker sides of valued networked learning principles, such as dialogue and collaboration.

The next chapter in this Part is entitled *The Blockchain University: Disrupting 'Disruption'?* Here, Petar Jandrić and Sarah Hayes explore the mission of Woolf University, a currently dormant attempt at making the first blockchain-powered university. The title of their contribution expresses both hope and pessimism regarding the initiative. Their pessimism finds its expression by framing the initiative as another avenue of platform capitalism, promising to disrupt existing industries. This is known from e.g., AirBnB upending the accommodation rental market, but with untoward and often unforeseen consequences. Alternatively, Woolf University can be framed as an attempt at bringing to life some of the visions that Illich formulated in *Deschooling Society*. Illich was critical of key institutions and took the school as a paradigmatic example of a social structure that needed challenge and reform. His vision was fairly specific and arguably is mirrored in the design of Woolf University. Illich's vision was set apart from prominent, contemporary platforms by being highly critical of the capitalist setting of the provision of education and other fundamental goods. At the time of writing, it remains an open question whether Woolf University will instantiate some of the unfortunate consequences of platform capitalism, such as precarious forms of employment, or it will achieve what Jandrić and Hayes join others in calling the oldest idea in Higher Education: scholars supporting each other. Either way, the blockchain university is certainly an innovative networked learning format and the chapter contributes a timely analysis of the potentials and risks this format faces.

In the chapter *A More-than-Human Approach to Researching AI at Work: Alternative Narratives for Human and AI Systems as Co-workers*, Terrie Lynn Thompson and Bruce Graham discuss different conceptualizations of the new types of work situations which integrate human and AI systems. The authors argue that networked learning scholarship needs to understand, firstly, the new competencies that are developing as workers learn to work with AI and, secondly, the implications for professional learning within the workplace and higher education. In the current AI-debate, little attention is paid to the fine-grained details of how AI is adopted in practice and how it affects what Thompson and Graham term networked work-learning. Furthermore, much of the AI-debate is wrapped in a basic Human versus AI narrative, reinforcing binaries of human vs. machine, worker vs. AI, and human cognition vs. artificial cognition. In these accounts, workers and AI systems are portrayed as connected, yet separate. To counter these narratives and to strengthen the analytic attention to the complex interactions unfolding between AI systems, workers, policies, and public narratives, Thompson and Graham suggest a more-than-human approach. This includes viewing networked work-learning practices as

distributed across multiple networks and a series of complex social and material (digital) relations. The chapter is a very welcome contribution to an area within Networked Learning that sparked intensive debate during the conference and in the final plenary but has received less attention in writing. Similar to discussions of Learning Analytics (De Laat & Ryberg, 2018) networked learning researchers seem to shy away from engaging empirically or design-wise with examples of AI. The more-than-human approach proposed by Thompson and Graham serves as a good entrance point into future empirical studies of AI in work and higher education.

Magda Pischetola and Lone Dirckinck-Holmfeld explore a set of background assumptions at work when thinking about learning in their chapter *Exploring Enactivism as a Networked Learning Paradigm for the Use of Digital Learning Platforms*. While the authors are sympathetic towards social constructivism for its emphasis on the importance of discovery through social interaction, they argue that enactivism is called for to overcome a dualism between body and mind. They show how this resonates with several aspects of more recent approaches to cognition as extended, but argue for relying primarily on the work of Varela and Maturana to propose a theoretical framework that sees cognition as situated, embodied and enacted. This contrasts with e.g., abstract mental modelling being the central theoretical term when understanding learning. The many different kinds of things that make up the environment of an organism emerge clearly as that organism's networked architecture of learning. On this background, the authors analyse data from a study on the introduction of a new learning platform. They single out participatory workshops as a crucial avenue for making the learning platform a genuine part of the teachers' environment, rather than an adversary or being in their way. By engaging in what is called enactive modelling—which contrasts to mental modelling—teachers not only learn by doing, but the 'world is done' through their actions. This constitutes an important new perspective on Networked Learning, both as regards its conceptualization as embodied and 'enworlded' and as regards the resulting implications for how to innovate networked learning in practice.

The final chapter in Part 3 is *A Framework for the Analysis of Personal Learning Networks*. Here, Nicholas Fair explores a key theme within Networked Learning research, namely that of conceptualizing, understanding and analysing networks in the context of learning. His innovation of networked learning is anchored in a new method for network analysis. Two guiding ideas inform the development of this method. First, humans find themselves in a myriad of intermingling online and offline networks of very different character. Second, a person's set of networks—their personal learning networks (PLN)—are carried over as learners enter new institutional contexts, such as higher education. Fair explicates how the concept of a personal learning network is designed to overcome challenges with studies of networks at both micro- and macrolevel: The method allows for comparison of the otherwise highly contextualized networks of individuals, while offering a way of describing how personal preferences influence network behaviour—a challenge with macrolevel network studies. Networked interactions are analysed in terms of interaction mode, interaction purpose and an interaction endpoint. Based on quantitative data from students participating in a MOOC (*Learning in the Network Age*), Fair

shows how a PLN mapping tool can visualize generalized personal learning networks and describe e.g., size and interaction preferences. Further, PLN data can point to how for example gender, life stage and attitude to technology impacts personal learning networks. Understanding the character of personal learning networks can prove crucial for future design for learning in higher education. At present, the data suggests that existing PLN are underused for important educational activities, such as library use and interaction with teachers.

13.2 Emerging Issues for Future Research Within Networked Learning

In this second section, we look at issues emerging for future research within networked learning. These issues emerge from points taken up in the chapters, as summarized above, and indeed from discussions at the 12th International Conference on Networked Learning (NLC2020) itself, which formed the outset for this book.

13.2.1 Design for Collaboration in Networked Learning

Design for collaboration is both a theme in this book and an emergent theme for future research. Being able to collaborate to solve problems together, as well as engaging in relationships that provide access to such collaborations, have become fundamental to keep up with change and innovation around us. The notion of learning in the wild has been put forward to describe such collaboration in informal learning that happens outside formal classes. This learning is often spontaneous and can be organized in public digital social media or open practices where users 'pose questions and other users provide answers, where crowds of participants comment, correct, agree and/or argue about the answers' (Del Valle et al., 2018, p. 158). The recent community discussion on the definition of networked learning also emphasized the need for collaboration and expressed the importance of human relationships to foster learning as well as a commitment to collaborative inquiry and joint action in the face of shared challenges (Networked Learning Editorial Collective, 2020).

The chapters in this book thematize collaboration in different ways and together represent various approaches to a pedagogy of design for collaboration. From this perspective, the overarching question that the chapters provide different answers to is: How can we design for collaboration in ways that increase good and effective collaboration practices? An important emerging issue for Networked Learning is the need for frameworks to support our theoretical understanding of what constitutes

good and effective collaboration as well as to inform designs targeting collaboration in practice. Below we point to six central questions that we see as systematic design aspects which must be taken into account in the development of such frameworks:

- Why collaborate—what are the goals and focus areas of collaboration?
- Who collaborates—who are the participants in collaboration?
- What skills are needed—what are collaboration skills?
- How can collaboration be supported—what supports collaboration?
- Which tools afford collaboration—what are collaboration tools?
- Where should collaboration take place—which environments and design spaces afford collaboration?

Collaboration is a defining feature of good practice in networked learning because of its many potentials. The question of 'Why collaborate' thus has multiple answers: Collaboration has the potential of enhancing problem-solving and innovation; of benefiting the development of social relations; of connecting people and information; of creating a unity of purpose between people; and of supporting the evolvement of shared language, knowledge, and values. From an educational perspective, a key aspect of collaboration is the more general potential for supporting the participants' mutual and individual learning. Fundamental to realizing this general potential is developing designs for collaboration practice focusing on enabling others to learn. An example of such a design is found in Chap. 2 by Gachago et al. Here, the authors discuss how being engaged in active collaborative learning fosters joint problem-solving, and, more specifically, how their approach to design thinking promotes educators' interdisciplinary collaboration aimed at tackling complex or wicked problems.

Another answer to the 'why collaborate' question is the goal of supporting designers in developing their design practice through their engagement in a collaboration practice. That would be the answer from the designers in Chap. 6 by Duin et al. This answer can, however, be further queried as regards purpose: why is developing design practice significant—what is the focus area and long-term goal? In this specific case, the designers (who were also the researchers) invited instructors from two technical communication societies to collaborate with the aim of developing an understanding of digital literacy and to utilize this understanding in creating instructional units to support digital literacy. Students were also asked to engage in different ways: to examine the resulting learning objects, to contribute by archiving single objects and to curate new collections. The perspectives of these different participants will provide at least two different answers to the further query of why developing design practice is significant. In the perspective of the learners, the goal is the benefits to their learning that the resulting designs will allow. In the perspective of the designers as researchers, the goal is to investigate how a learning community can be developed and supported.

The answer to 'Why collaborate' can also be rooted in more elaborated pedagogical theories. Chapter 7 by Carvalho, et al. describes a learning network designed to promote social action in Brazil that is inspired by Freire's pedagogy. The goal of the learning network is to engage people in conversations about political systems and to

deal critically with reality. In Chap. 9, Jandrić and Hayes, inspired by Illich, discuss collaboration within a university setting and how an organization can support collaboration—or cooperative working—between students and between students and teachers. In both of these latter cases, the answer to the why-question is to empower participants and benefit social development.

As is evident for all these chapters, the question of 'Why collaborate' is inherently bound up with the second question of 'Who collaborates': Different kinds of participants will be differently placed—and differently inclined—to entertain and pursue goals of collaboration. This point is significant in understanding the problems which Riis and Brodersen's report that teachers had when developing designs for students' boundary crossing. The teachers were not used to thinking of boundaries as 'learning assets' (Wenger-Trayner & Wenger-Trayner, 2015) and, correspondingly, of boundary crossing as an aim in itself. Therefore, their designs for students' collaboration with participants involved in the boundary crossing were limited. This of course also affected the teachers' own collaboration in the project, specifically their collaboration on how to use technology to foster relationships between different groups encountered by the students in their boundary crossing.

The question of 'How can collaboration be supported' is the question of how to shape involvement, i.e. how collaborators can be supported in sharing, designing, and working together in ways that make their practice better. This question is picked up rather well with the design lenses presented throughout this book. This is so because having a design approach that is aimed at actively involving participants puts the focus squarely on the practice that people have in common. This works as a common ground which brings learners together and allows them to start making meaning together. An example of this is given in Chap. 4 where Pallitt et al. use design frameworks to promote self-directed and authentic learning as part of professional development to help teachers reflect on their own practices and learn from each other.

As indicated, the six design questions must all be taken into account when targeting collaboration in practice. We illustrate this point for Chap. 5 by Bülow and Nørgård, and at the same time exemplify the three remaining design questions. The chapter investigates teachers' roles as collaborative designers (the who), where teachers take up the role of becoming developers, co-developers or remixers of own or others' educational materials (the why). As regards the question 'What are skills of collaboration', the chapter points to three skills: (1) knowledge sharing, (2) gauging the necessary time, resources and personnel to be engaged, (3) navigating the constraints and affordances of technology. The question 'Which tools afford collaboration' is central in the chapter, as a specific tool is chosen as the prime support of collaboration (which answers the support question). The tool is the CourseBuilder which offers a framework for designing, sharing, redesigning and resharing educational materials. It supports the teachers in taking on the role of educational designers to combine elements from various digital materials to make up an entire course, which can be shared with classes, groups of students and colleagues. CourseBuilder therefore also becomes the answer to the question of 'Where should collaboration take place?' because it includes an online design space which supports teachers'

collaboration on and remix of educational materials. The design space can furthermore accumulate teachers' design knowledge over time as they design, share, redesign and reshare educational materials. In this sense, the design space can reflect the history of the projects and materials. However, as Bülow and Nørgård note, the collaboration between the teachers involved in the project was less than expected. This points to the danger of assuming that a tool in itself is enough to support collaboration, i.e., of conflating the two questions of 'How can collaboration be supported?' and 'Which tools afford collaboration?'.

Looking ahead, the different ways in which the design-focused chapters of this book approach the six design aspects of collaboration spark a wider interest in investigating at least two areas: (1) How the six design aspects are present and integrated into existing collaboration projects and practices in general. (2) How future design research can contribute to develop knowledge about the six design aspects of collaboration, how they interrelate, and how an understanding of them can help improve collaboration practices.

13.2.2 Complexity of Online Networked Learning in Diverse Physically Located Environments

As indicated in the Introduction to this book, NLC2020 was one of the first conferences to be converted into an online format in response to the COVID-19 pandemic. Many discussions at the conference revolved around the experience of participating 'together apart'—being together in the online live sessions, but geographically apart across the globe in different time zones. The complexity of this was an issue repeatedly pointed to, along with the multifaceted nature of the complexity. The logistic challenges of participating in sessions at odd hours of the day (and night) are obvious, as are, probably, the resulting issues of integrating conference participation with family routines and obligations. Perhaps less obvious are the possibilities which the divergence in physical locations offered as regards making use of local physical resources in conference presentation, rather than having to pack and relocate all necessary material for participation in a physical conference. Taking this a step further, all participants had direct access to their own network connections to people and things physically present in their lock-downed locations, in a way which one usually does not. The networked experience of the conference thus dispersed through a network of networks centring on each participant's co-located ego network (Marin & Wellman, 2014). Or, allowing more explicitly for the role of non-human resources in the physical environment, a more precise formulation would be: Centring on each participant's co-located entanglement of socio-material resources. This contrasts clearly to what is the case in physical conferences.

At the same time, the fully online immersion with peers was also treated as an escape from the narrow lock-downed physical world, as many of the conference delegates, while adjusting to mostly working from home, realized they missed the

deep conversations and shared reflection on topics close to their interest and research. The conference acted as a space to fill this void and was seen as a welcome re-connection with the scholarly conversations we all used to have so frequently at conferences and events. This shows the potential of online synchronous formats, when used in interactive ways, rather than as an asynchronous broadcasting avenue. The risks for learning involved in the latter was the focus of Lesley Gourlay's keynote address at the conference, *Why the online lecture is not a lecture: Presence, absence and performance*, which criticized the tendency (during COVID-19 lock-downed teaching, but also in the online part of flipped classroom teaching) to substitute the live lecture with an online video recording. This neglects that the live physical lecture, even when totally teacher-centred, is still intensely interactive because of co-presence and ephemerality.

These considerations resonate with points made in several of this book's chapters and constitute an important issue emerging for future research, i.e. the complexity of online networked learning in diverse physically located environments. Chapter 8 by Cutajar highlights several of these complexities: It speaks to the logistic challenges of integrating a part-time online course with 12 participants' dispersed full-time work. Conversely, it shows that such an online course can function as a reflective retreat from full-time work. Finally, it joins other studies (see e.g., Dohn & Kjær, 2009; Smith, 2012) in underlining the potentials for learning and knowledge sharing involved in anchoring online course work in participants' self-defined inquiry into the work or life practices of their physically located contexts. The case study presented by Carvalho et al. in Chap. 7 points to the opposite move, namely how online resources and discussions can support a learning network spanning Brazil, in particular feeding into and informing physically based learning activities throughout the country. Between them, the two case studies thus illustrate how significance shifts and transforms across contexts, as participants' repeatedly background and foreground the different contexts which they participate in. The philosophical points in Chap. 11 by Pischetola and Dirckinck-Holmfeld help conceptualize these moves and shifting anchorage points as 'different embodiments and sense-making processes. Pischetola and Dirckinck-Holmfeld's enactivist emphasis on the situated and embodied character of learning stresses the co-dependence of learner and environment, where the learner is only one element in an entangled network. These points underscore the significance of investigating the resulting complexity of situated participation in several contexts (physical, virtual and hybrid) at once, where the body is only physically located in some of them.

A somewhat different conceptualization of the complexity is found in Fair's understanding of the Personal Learning Network (PLN). Focusing less on the situated and embodied character of learning and more on the interweaving of diverse resources and settings, Fair articulates the ego network of learning as the individual's choice of connections to people, devices, services, and information resources. His framework for analysis of PLNs, explicating interaction paths involving mode, purpose and endpoint, is well suited to capture the complexity from the individual's point of view. It also points to a further important aspect for future research: investigating ways in which higher education can support learners in negotiating

the complexity by recognizing and nurturing their PLNs to a larger extent than is presently the case.

Taken together, the analyses proposed by Fair and by Pischetola and Dirckinck-Holmfeld indicate the need for future investigation of how individual perspectives of self-regulated choice and enacted perspectives of co-dependence can complement each other—or even be integrated—in an understanding of the complexity of online networked learning in diverse physically located environments. In delving into this, previous work presented in the anthology edited by Carvalho, Goodyear and De Laat on *place-based spaces in networked learning* will be worth revisiting. The anthology holds insightful analyses of how concrete socio-material entanglements of specific physical places present affordances for individual learners' learning as well as for learning networks' communication across different locations (Carvalho et al., 2017). Conversely, early studies of the 'fractured ecologies' (Luff et al., 2003) that result when the body is located in one physical context and communication takes place in another, virtual, context, may challenge us to develop our understanding of the embodied living of networked learning, from both the individual PLN perspective and the enactivist co-dependence perspective. The work of Dohn (2014) on the significance of learners' tacit knowledge in primary contexts may here be drawn upon to investigate how learners make sense of the shifting foreground/background of their online and physical settings.

A further question concerns when and how physical presence is preferable to meeting up online from different physical locations. A fact that emerged at NLC 2020 and has become even more salient in the months following the conference is that there has to be a clear value add to make the journey and time investment of face-to-face (f2f) gatherings worthwhile. This new reality is now often referred to as the 'new normal'. But an important issue for future research is what this new normal entails in practice for individuals, groups and organizations. Will it enhance our participation, engagement and experience of learning and working together? How can we develop an informed framework for guiding decisions about meeting f2f or 'doing it online'? Certain things don't work well in Zoom for example. Online meetings are mostly experienced as focused and purposeful and people turn up for the meeting and log-off once the meeting is over. However, there is little or no room for the one-on-one catch-ups in between agenda items or during breaks. On the whole, the opportunity for serendipity which f2f meetings facilitate well is harder for online networks to offer spontaneously. Serendipitous learning, for instance through online social media, has been studied (Kop, 2012; Pardos & Jiang, 2020; Saadatmand & Kumpulainen, 2014), but it seems that our new reality prompts different questions about how to value and appreciate the power of serendipity in f2f and digital settings (Björneborn, 2017; Reviglio, 2019). Similarly, the new normal may require us to reflect differently on the social architectures that guide our future learning designs. Previously, research in this space has been done in order to understand, for example, to what extent f2f and/or online settings facilitate getting to know each other, improvisation, collaboration, knowledge construction and engagement in discussions (Ellis et al., 2006; Jeong & Hmelo-Silver, 2016; Stodel et al., 2006; Yu & Yuizono, 2021), but it is likely that the strict requirements for

online participation in the wake of COVID-19 will have led to more pervasive and widespread experiences of learning in online and hybrid situations. Research into these experiences should extend our understandings of the complexities of learning in both online and f2f situations (and combined).

13.2.3 The Nature of Learning and Cognition

Studies of learning are naturally intertwined with more general theories of cognition. For example, in the philosophy of mind, the thesis of extended cognition propounded by Clark and Chalmers (1998) seems to have both predecessors and developments in the fields of learning. Dewey's (1938/1986) central concept of an organism with tool-based distance receptors questioned ascribing crucial importance to having our skin or skull be a fundamental limit in an account of cognition; so did similar observations by Merleau-Ponty (1962) and Polanyi (1966). Likewise, Vygotsky's notion of mediation and his claim that human cognition and activity is shaped by cultural tools broaden the very idea of cognition (Vygotsky, 1978). From the 1980s, learning scientists were both deeply inspired by, and critical of, a computational model of the mind (Falkenhainer et al., 1989; Gentner, 1983). Lave's (1988) critique of such models developed into the understanding of situated learning (Lave & Wenger, 1991), an idea that has been hugely influential, not least within Networked Learning research, and led Sfard (1998) to speak of two basic metaphors of learning. Following on from Öztok's point in Chap. 1 that the field of Networked Learning must develop a clearer understanding of what learning is, we propose the raising of more fundamental questions about the nature of learning and cognition as a central theme for future research. Significant in pursuing this theme will be an investigation of the coherence and commensurability of the different philosophical underpinnings of the learning theorists upon which Networked Learning research draws. Hansen (2020) here argues that an important heir to Dewey's focus on an organism in an environment in many respects is the overall framework of actants in networks, proposed by Latour (1987); a framework which has been utilized in many papers at NLC over the years, but hardly ever in explicit recognition of its relationship with Dewey's pragmatist approach. Engaging Latour's framework through the lens of Dewey's pragmatism offers the field of networked learning a significant role in developing a philosophical understanding of the agency which all sorts of things can have in learning.

Latour's framework is a clear forerunner to what is now called the socio-material perspective, represented in this book in Chap. 10 by Thompson and Graham and their more-than-human approach to understanding AI in relation to networked work-learning practices. Their contribution opens to the complexity of not only understanding human learning, but to understand how learning and work change and unfold when work and decision making is distributed between humans and various implementations of AI. Ideas of distributed cognition obviously are not new and have been explored earlier by, for example, Hutchins (1995). Further, such ideas

serve as an undercurrent in most sociocultural theories about learning; unsurprisingly so, given their ancestry in the above-mentioned Vygotskian point that there are inextricable connections between cognition and cultural tools. However, a dawning question is whether we need to extend our thinking when the 'tools' themselves become systems that 'learn' from our interactions with them, and whether they should be viewed as intelligent actors in their own right, be viewed as intelligent agents by proxy (programmed by others), or whether they should be understood as actants similar to human agents.

The current paradigm of '4E cognition'—cognition as embodied, embedded, enacted and extended—is a contemporary approach to describing the organism's interrelatedness with the world (Newen et al., 2018). It is frequently portrayed as a relatively recent development, but in point of fact it draws on much previous research. In Chap. 11, Pischetola and Dirckinck-Holmfeld argue for reverting to its significant predecessors represented in the concept of autopoiesis and enactivism as put forward by Varela et al. (1974) and subsequent work. In the early 1990s, Varela and colleagues (1991) joined the then growing criticism of the computational theories of mind and, like many others, they saw this theory as integral to cognitivism and therefore rejected the latter position. Pischetola and Dirckinck-Holmfeld follow them in this rejection and instead rely on their more biologically informed theoretical apparatus. Given the concepts of autopoiesis and enactivism, Pischetola and Dirckinck-Holmfeld discuss how this apparatus can contribute to and refine approaches such as socio-constructivism and situated learning, and, of course, research in networked learning. However, it is important to realize that cognitivism is a moving target (Gentner, 2019) and is no longer adequately captured in the computational theories of mind hailed by cognitivists in the last decades of the twentieth century. Both the concept of computation and the understanding of logic has changed and been refined. Cognitivism should therefore remain a conversation partner in developing the philosophical underpinnings of learning, also for the field of networked learning.

Quite as important as creating coherence in philosophical underpinnings, however, is the elaboration of the concept of networked learning itself. As noted by Öztok in Chap. 1, the field remains subject of both definitional work and development (Gourlay et al., 2021; Networked Learning Editorial Collective, 2020). A significant tenet in this work is the drawing in of predecessors as part of establishing a narrative of the field. In this vein, the importance of the work of Illich is emphasized both by Riis and Brodersen (Chap. 3) and, as mentioned, by Jandrić and Hayes (Chap. 9) as a way of framing their contributions. In the context of analysing ICTs in Danish VET, Riis and Brodersen thus see boundary objects as excellent examples of convivial tools, one of Illich's key terms of art. Jandrić and Hayes' analysis of the prospects of The Woolf University similarly focuses on whether or not it succeeds in embodying the values that informed Illich's vision and design for networked learning. In this way, the heritage of networked learning is enlisted for the purpose of offering a trajectory for future work in the field. This resonates with the Networked Learning Editorial Collective's recent suggestion that the notion of convivial tools be seen as an important concept for networked learning,

in their paper inviting a current re-definition (Networked Learning Editorial Collective, 2020).

Öztok's contribution in this book (Chap. 1) also adds a piece to the narrative of the field. Looking at the history of networked learning as an academic field with a series of writings from the biennial conferences, Öztok analyses how the original definition proposed by Goodyear et al. (2004) has been further conceptualized by the community. Öztok finds that the literature does in fact remain within the admittedly quite wide bounds set by the definition. Discussions of how technologies allow for promoting connections are a stable of networked learning, while methods of studying networks and concepts of learning display great variety.

13.2.4 Politics and Ethics in Networked Learning

Ben Williamson's keynote address at NLC 2020, entitled *Networked Learning Bodies: Making Learners Machine Readable Through Psychometric Data, Neurological Data and Biodata*, burst discussions of politics and ethics in networked learning wide open. While sentiments can be difficult to gauge accurately, a lot of the response in the simultaneous chat suggested a dominant pessimism concerning a range of new technologies being deployed in the context of learning. The community's response to Williamson's account of recent developments thus underlined the values of, e.g. autonomy and curiosity, and voiced deep-seated concerns about marketization and certain kinds of behavioural measurement and design. This skepsis towards the introduction of these new technologies into the domain of learning and education makes for a contrast to the more optimistic engineering approach to the humanities that Dewey espoused. As described by philosopher of technology Mitcham, Dewey '...repeatedly calls for the application of science not just *to* human affairs but *in* them to make them more intelligent... The solutions to the problems of technology is not less but more, and more comprehensive technology' (Mitcham, 1994, p. 38).

Since Dewey, overall optimism and pessimism about technology has fluctuated in different areas of academia as well as in discussions of learning. The early days of the internet saw political theorists express faith in the potential of networks to further political reform (Castells, 1996/2002). Meanwhile, Noble (1998) was taking an overtly critical stance to the introduction of what he saw as industrial production principles into higher education. Within the area of educational technology there are also marked differences in the perception of technologies, from enthusiastic and positive accounts to cautious, critical and pessimistic stances (Poritz & Rees, 2017; Selwyn, 2011). The Networked Learning community here strives to offer balanced, critical as well as constructive accounts of *how* technologies can have politics, and how power struggles play out in implementations of technology in education. Rikke Toft Nørgård in her keynote address, *Designing for Computational Creativity and Technological Imagination with Teachers Across and Within the Disciplines*, thus pointed to the risks which current education-political tensions in defining the field of

computational thinking hold for education and educators. However, she also gave concrete examples of the possibilities which computational creativity offer to teaching and learning when technological imagination is allowed and fostered. As discussed, Jandrić and Hayes in their contribution (Chap. 9) hold up current technological developments against visions and values from early proponents of networked learning. Their assessment is that the technology in question holds a liberating potential but also embodies an advanced platform capitalism. A similarly nuanced perspective is evident in Chap. 7 by Carvalho et al. where the authors explore how a learning network furthers awareness of political structures in Brazil, fostering knowledge and inviting participation in an otherwise tense and polarized political milieu. Such detailed studies are an important complement to the widespread 'grand narratives' of technological development.

Critical discussion of AI applications is gathering momentum in many research fields. Whereas previously AI was mostly an issue discussed by philosophers and computer scientists as well as an element in fanciful projections by futurologists, nowadays political and ethical questions related to AI are being analysed and debated as an integral part of work processes and social practices (e.g. Umbrello & van de Poel, 2021). Although AI systems are not (yet) completely autonomous agents, they can with increasing success do things that have been thought primarily to belong to the domain of humans: prediction, speech and image recognition and use of natural language. This means that a class of actants are emerging that humans have to work with, listen to and negotiate with in different contexts. The domain of a large range of human activities is therefore likely to undergo change in decades to come. Transparency of decision-making processes and accountability are key topics when decisions are delegated to AI or supported by decision systems (Binns, 2018). Education is unlikely to be exempt from such developments and influences. In their discussion of AI in work settings, Thompson and Graham thus also refer to chatbots and AI in educational contexts, highlighting among other things the unjust character of algorithmically based predictions of grades (Chap. 10). During the COVID-19 pandemic, such predictions were initially made to pass for actual grades, and the predictions were widely criticized for being biased against students from poorer schools. At any rate, various kinds of AI are likely to feature more dominantly in the learning networks that both researchers and learners will encounter in the years to come.

The question is how we address these issues from a networked learning perspective, and in particular, how we balance between conceptual critique and actual engagement with AI implementations. As highlighted by De Laat and Ryberg (2018), the networked learning community has tended to engage with fields such as learning analytics and AI predominantly from a conceptual, critical perspective. This kind of work is very important and highly valuable, but other studies illustrate that there is also a value to engaging with such technologies from a more playful, experimental perspective. An example is the work reported in Bayne (2015) and Ross (2017) on their project with automatic teaching utilizing a Teacherbot. Pointing to concrete playful examples to balance overall pessimism speaks to the concerns raised by Thompson and Graham that much public and academic debate revolve

around 'grand narratives' and imaginaries of what AI will and can do for either good or evil. Instead, they call for more detailed empirical accounts of how these technologies are adopted within work and education and how they affect concrete actants in practice. It would be interesting to see more empirical work as well as playful, reflexive and critical experimentation with such technologies.

13.3 Concluding Remarks

With this concluding chapter, we have homed in on the ways in which the body of the book speaks to the overall theme of *conceptualizing and innovating education and work with networked learning*. In the first section, we articulated the contribution of each of the book's Parts and their respective chapters: Part 1 addresses the conceptualization and innovation of *professional learning* with networked learning; Part 2 similarly does so for *learning networks developing and utilizing digital resources*; and Part 3 looks at how *networked learning itself* can be (re)-conceptualized and innovated. Preceding the Parts, a first chapter traced the conceptualization of networked learning's basic terms in past conference papers. In the conclusion's second section, we identified a set of issues emerging out of the chapters—and indeed of the conference of NLC2020 itself—as focus areas for future research: *design for collaboration in networked learning; complexity of online networked learning in diverse physically located environments*; *the nature of learning and cognition*; and *politics and ethics in networked learning*.

These issues are emerging in the sense that their relevance and timeliness, and the need to take them on in future work, stand out from the book's discussions. They are, however, also variants of questions whose investigation is ongoing within the field of networked learning and has been so for several years. This is clear when looking at the conference themes in Call for Papers for past Networked Learning conferences as well as at the themes in the Call for Papers for the next one, to take place on May 16–18, 2022, at Mid-Sweden University. The latter Call thus mentions *Collaborative* (and cooperative) *learning* as an overall focal point. Among the conference themes are: *Conceptualizations of networked lifelong learning as a blended, boundless or hybrid phenomenon* and *Learning on the move: places and spaces for networked learning* (articulating aspects of *complexity of online networked learning in diverse physically located environments*); *Ethical perspectives on Networked Learning* and *Roles of artificial intelligence, big data and learning analytics in Networked Learning* (echoing *politics and ethics in networked learning*); and *Philosophies for Networked Learning* and *Situating Networked Learning conceptually, historically or systematically* (in line with the way *the nature of cognition and learning* presents itself as an emerging issue). We look forward to continuing the debate about these significant topics in Sweden in 2022!

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