

## A Cartographic Review of Teacher Educators' Professional Learning with an Aesthetic Approach

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### Abstract

Experimenting with innovative and creative ways to conduct a literature review aligns with the paradigm shift from qualitative to post-qualitative research, which is concerned with doing and becoming rather than being. The aim of this article is twofold: to unfold the process of a cartographic approach to conducting a literature review; and by exploring the literature to discuss what an aesthetic approach activates in teacher educators' collaborative professional learning activities. Inspired by Deleuze and Guattari (1988)'s cartographic principle of the rhizome, and post-qualitative inquiry more generally, this review generates knowledge through connections of concepts across 21 international research projects from teacher educators that use an aesthetic approach in their collaborative practices. New components of professional learning are found by mapping-and-tracing entangled concepts. A discussion of encounters within an aesthetic approach to professional learning shows how the processes involved in a cartographic review generates new directions in thinking, such as becoming-professional.

**Keywords:** cartographic review, post-qualitative inquiry, new materialism, teacher educators, collaborative professional learning, aesthetic approach

## Introduction

Systematic reviews are valuable for synthesising available knowledge on a given topic (Booth et al., 2022). Murphy et al (2017) cited in Alexander (2020, p.6) describe systematic reviews as: “the scholarly community’s efforts to look deeper into the edifice of education research to the bricks and mortar with which that structure is built”. However, this form of literature review emphasises a rigid construction concerning which protocols for performing a review can be applied (Gough et al., 2012; Prøitz, 2023a, 2023b). The proportion of systematic reviews has increased dramatically over the past 20 years and with that, the flaws in performance, methods and reporting of them (Hoffmann et al., 2021; Uttley et al., 2023). Deviations from the protocols are considered problematic and how to perform a review is open to debate (Gough et al., 2012; Prøitz, 2023a, 2023b).

Murphy et al's (2017) reference to knowledge as “the bricks and mortar” to be found in educational research literature concerns finding and using existing knowledge. This conceptualisation is echoed in Sauzet's (2021, p. 80) post-qualitative approach to review. However, when a literature review is concerned with *knowledge emerging through relations* within the content of the literature, novel methodologies are required. Experimenting with new and more creative ways of performing a literature review aligns with the paradigm shift from qualitative to post-qualitative research, which is more concerned with doing and becoming than with being (Fox, 2023; Murriss, 2021, p. 2; Sauzet, 2021). The review we recount in this paper is not about what is already known in literature about teacher educators’ professional learning or about identifying a gap in this knowledge, which tends to be the focus of systematic reviews (e.g. Forsström & Munthe, 2023; Ping et al., 2018). Neither are we pursuing classification of what others have written concerning an aesthetic approach in teacher education, or in search of different understandings of an aesthetic approach to professional learning, which has been pursued through systematic or configurative approaches to a review (Levinsson & Prøitz, 2017). Instead, we explore what an aesthetic approach *does* and/or *produces* in teacher educators’ collaborative professional learning activities, an underexplored theme in the literature (Ping et al., 2018). This is not about filling a gap but generating knowledge in new directions.

In this article we therefore use the cartographic principle of the rhizome as an approach to inquiry, which opens up for connections between a diverse range of material (Deleuze & Guattari, 1988; Fox, 2023; Hickey-Moody, 2016). New knowledge pathways open to give new insights into educational concepts, and enable reconceptualizations (Taylor, 2021). Deleuze and Guattari (1988) introduce the performative notion of emerging connections by mapping a rhizomatic structure. This performative notion is the cartographic principle that characterises a rhizome. The cartographic principle is used as an analytical approach to review and seek knowledge in the connections of concepts and literature.

“What the map distinguishes from a tracing is that it is entirely oriented towards an experimentation in contact with the real. The map does not produce an unconscious closed in upon itself; it constructs the unconscious. It fosters connections between fields... It is itself a part of the rhizome.” (Deleuze & Guattari, 1988, p. 12)

The aim of this article is primarily *to explore and unfold the process of a cartographic approach to performing a review*, and secondly, *to explore literature and discuss what an aesthetic approach does and/or produces in teacher educators' collaborative professional learning activities*. This double aim is necessary, because the second aim defines the context, and without a context it is not possible to unfold the process of a cartographic approach. A context is needed since “[a rhizome] has neither a beginning nor end, but always a middle (milieu) from which it grows and which it overflows” (Deleuze & Guattari, 1988, p. 21). The literature reviewed in this article is “a middle” (p. 21) in “contact with the real” (p. 12).

Cartography has encouraged scholars to explore movement rather than classification and so evading dualism (as e.g. Braidotti, 2013; Dolphijn & Tuin, 2012; Lenz Taguchi, 2017). Methodological experimentation is characteristic of post-qualitative inquiry and post approaches in contemporary research (St. Pierre, 2021; St. Pierre et al., 2016). Following this tradition, our work pursues an experimental ambition of disrupting what a literature review can become through a cartographic approach (Fox, 2023). Thinking with theory through a cartographic review requires describing the process of “experimentation in contact with the real” (Deleuze & Guattari, 1988, p. 12) by making visible new components and concepts through analytic practice. This is unfolded through encounters of concepts and literature. An encounter is understood as a meeting between concepts which invites a pause to think, since the relation between the concepts is sensed but not yet understood (Jackson, 2017, p. 669). Thinking with theory also involves working with borrowed concepts from post-foundational theory offered by Deleuze and Guattari which includes cartography, rhizome and techniques such as “mapping-and-tracing” (Lenz Taguchi, 2016, p. 221) and drawing lines.

### **Outline of the article**

We make visible the processes involved in performing a literature review using a cartographic approach by seeking knowledge in the encounters of concepts and literature. To do this, we provide some background to the review of international literature concerning an aesthetic approach to teacher educators' professional learning activities. We then elaborate on our post-qualitative approach to reviewing. This is followed by an exploration of the analytic strategy, where the notion of cartography shapes the analysis. This includes the selection procedure and analysis of the literature, from both a methodological and content perspective. In the last section on ‘Unfolded encounters’, we elaborate on the process and encounters approach to performing a cartographic review and how this generates new directions in understanding collaborative professional learning.

### **Background to the content of the review**

Teacher educators' professional learning has become an discrete field of research, where learning through collaboration is central to inquiry (Ping et al., 2018). Collaboration in research and learning is identified as key to professional learning and a necessary for teacher educators to develop professionally (MacPhail et al., 2019; Tack et al., 2021). In this review focus is placed on one specific approach to collaborative professional learning activities: an aesthetic approach, i.e. a

significant activity that involves experiencing sense-based and shaping activities (Østern et al., 2019) such as, going on a sound journey (Chisholm et al., 2021) or painting murals (Bowell, 2015). With the increased focus on critical thinking and creative learning processes in schools teacher educators are challenged to develop aesthetic approaches to education (see e.g. Harris et al., 2018). Several international studies concerned with an aesthetic approach indicate that student teachers are underprepared for teaching with critical thinking and creative learning processes in schools during their pre-service teacher education (Davis, 2017; Duma & Silverstein, 2008; Garvis et al., 2011; Wade-Leeuwen, 2018). Russell (1997) and Kelchtermans (2009) research with teacher educators demonstrates how their teaching influences their student teachers' learning; a focus on teacher educators' practice is therefore significant.

In this review, we address the concept of teacher educators' professional learning from a collaboration-with-an-aesthetic-approach perspective. This ambition benefits from exploring the contours of the concept of teacher educators' 'collaborative professional learning'. Even though much research on professional learning for teacher educators gives insight into the importance of collaborative activities, it does not conceptualise processes of relations between concepts discussed (Czerniawski et al., 2017; Kosnik et al., 2015; Ping et al., 2018). We therefore focus on the complexity of the relation between the following concepts: *collaboration*, *professional learning* and an *aesthetic approach*, as well as what is shaped in the encounter between these concepts. Re-thinking entangled concepts such as these opens up and develops the view of the concept's creation of "orientations for thinking rather than [giving] answers to questions with a predetermined field of answers" (Colebrook, 2017; Taguchi & St.Pierre, 2017, p. 646). This exploration through the perspective of an aesthetic approach provides a broadened view, whilst also retaining a focus on collaborative professional learning.

## A post-qualitative approach to literature review

By using *theory to think with* the mechanistic coding in data interpretation and analysis usually expected in a systematic literature review can be omitted (Booth et al., 2022; Forsström & Munthe, 2023; Jackson & Mazzei, 2012, p. vii) and instead it is possible to question the doings/capability of the projects, people, contexts and materials used in the analysis (Deleuze & Guattari, 1988; Gunnarsson & Bodén, 2021, p. 6; Jackson & Mazzei, 2023). In this way our review has a new materialist orientation, taking both human and non-human agents into account (Gunnarsson & Bodén, 2021; St. Pierre et al., 2016; Taylor, 2021). Dolphijn and Tuin (2012, p. 85) describe new materialism as transversal; as they discuss, this cultural theory "does not privilege matter over meaning or culture over nature. It explores a *monist* perspective, devoid of dualisms that have dominated the humanities (and sciences) until today, by giving special attention to matter". The notion of transversality in new materialism cuts across the possible duality of scholarly disciplines (Dolphijn & Tuin, 2012, p. 101). Transversality enables new connections amid concepts and the more-than-human, which are free of hierarchies or categories from the disciplines (Tuin et al., 2022, p. 199).

Inquiry using cartographical methodology illustrates a second transversality in new materialism. In cartography an ongoing process averts dualism, whereas classification would engender it. Multiple

scholarly disciplines are included in the selected articles. Possible dualities between disciplines with different views on how knowledge is produced are not affirmed through classification. The ongoing cartographic process in the review contests that processes of becoming and processes of knowing are inseparable through knowledge production. *Thinking with* in this process is a doing whereby knowledge is emergent and ontological (Jackson & Mazzei, 2023, p. ix). Ethics are therefore also intertwined in the process of knowledge production and the whole is seen as “ethico-onto-epistem-ology” (Barad, 2007, p. 185; Gunnarsson & Bodén, 2021, p. 36). The intertwining of becoming, knowing and ethics is transversal. A specific aspect of a cartographic review is that the researcher’s ethical gaze, actions and responsibilities for what is produced as new knowledge are intertwined in knowledge production. An elaboration of this follows in the ‘In between movements’ section.

The two transversalities from new materialism outlined above are recognisable in a post-qualitative approach. A third instantiation of transversality, for the duality of paradigm, is distinct from the others. In demonstrating the workings of new materialism, Dolphijn and Tuin (2012) describe a focus on materiality when discussing paradigm as transversality. In the literature on post-qualitative inquiry transversality is about pushing against traditional qualitative data analysis. This paradigmatic transversality gives thinking with theory, or thinking in inquiry, an important place in methodology, thereby creating space for more creative ways of producing data and knowledge (Jackson & Mazzei, 2012; St. Pierre, 2021). A cartographic approach to review expands this transversality by starting the process with a more traditional qualitative selection of articles. This will be more clearly addressed in the section ‘First movement’, before proceeding with a post-qualitative analysis. In this review article, both new materialisms, as post-qualitative inquiries help to map the ‘doing’ and ‘producing’ of an aesthetic approach in collaborative professional learning activities in the selected literature.

Gunnarsson and Bodén (2021, p. 11) describe how materiality interacts actively, instead of just being a passive social construction in knowledge production. Taylor (2021, p. 30) prefers using *knowledge-ing* for the material practice of knowledge-making; she makes this distinction to underline the processual nature of knowledge-making. This cartographic approach to review is unfolded through a process of what an aesthetic approach can do within a context of collaborative professional learning; of what this approach sets in motion and about what is acting, and how, in these processes. Thinking with theory and this way of asking questions opens up new knowledge pathways, which the experimental nature of post-qualitative inquiry enables. This study contributes to knowledge-ing on thinking with theory in a review; it also re-thinks concepts to understand the doing of concepts and how they become in encounters.

## Unfolding a cartographic approach to a literature review

Inspired by the Deleuze and Guattari's (1988) cartographic principle of the rhizome, we created a map that exposes the vigour of an aesthetic approach in connection with collaborative and professional learning. To use cartographic principles as an analytic approach we work with the rhizome; in which every part is connected to every other part in every possible way, as illustrated in Figure 1.

Figure 1

*Rhizome, illustrated by a close-up picture of felted wool (Boks-Vlemmix, J. own work and photo, 2021)*



To explain how rhizome as a concept is brought into play, Deleuze and Guattari (1988) describe which principal characteristics matter. To put this concept to work in thinking with theory it must be connected to the empirical material: the selected articles of this review. This cartographic approach to a review study draws on research literature about teacher educators' collaborative professional learning with an aesthetic approach in teacher education and in schools. To look deeper into the connections between the concepts 'professional learning', 'collaboration' and an 'aesthetic approach' in the selected articles, we map the encounters between them. We do not explore the concepts by classifying them, but rather by using the concept of rhizome to think with in relation to the content of the selected articles. A rhizome can be seen as a map on which concepts and components of concepts can be traced and mapped, looking for "variation, expansion, conquest, capture, offshoots" of the concepts (Deleuze & Guattari, 1988, p. 21). This map is like a composition of different contour lines as "an a-centred, non-hierarchical, nonsignifying system" (Deleuze & Guattari, 1988, p. 21; Lenz Taguchi, 2016, p. 216). A cartography encompasses thinking, reading and exploring concepts in ways that find recognition in Deleuze and Guattari's philosophy, combined with a methodological approach whereby lines and traces are constantly questioned (Gunnarsson & Bodén, 2021; Spindler, 2013). When mapping professional learning, a line of all the selected texts is laid out in the rhizome. This is done by reading and finding where *collaboration* connects to (*professional*) *learning/learners*. The same process is applied to the connection between the *aesthetic approach* and (*professional*) *learning/learners*.

#### *Reading and finding with theory – putting concepts to work in the inquiry*

Putting the concepts 'professional learning', 'collaboration' and 'aesthetic approach' to work in the analysis process is not straightforward; there are no criteria to follow for this inquiry. However, Deleuze and Guattari (1988) describe the drawing of lines and how the different types of lines behave in the rhizome. For them, drawing lines is mapping the encounters between different concepts: "follow the plants: you start by delimiting a first line consisting of circles of convergence

around successive singularities; then you see whether inside that line new circles of convergence establish themselves..." (Deleuze and Guattari, 1988, p. 11). To approach mapping we drew upon texts from Lenz Taguchi (2016; 2017), Gunnarsson and Bodén (2021), Braidotti (2019) and Dolphijn and Tuin (2012) to aid reading and thinking with Deleuze and Guattari's rhizome, cartography and lines in relation to the selected articles in the review.

This cartographic approach to a review does not concern the philosophical creation of a concept (Deleuze & Guattari, 1994, p. 5), but the selected articles can be seen as a field of experience that, through inquiry, can visualise new components of the entanglement of concepts. In this way, we look at different combinations of components and how these combinations make entangled concepts visible. Jackson (2017) describes the encounter between the concepts as "a relation that is sensed, rather than understood" (p. 669) and uses Deleuze's (1994) explanation that, by disturbing our common sense, such an encounter forces us to think. Deliberately entangling the concepts 'professional learning', 'collaboration' and 'aesthetic approach' invokes an encounter in relation to the selected articles. In the meeting of concepts and articles, we are forced to think, and the relations that are sensed need to be understood. In this process of understanding, components of the new, entangled concepts emerge, because they are placed in relation to the content of the articles reviewed.

The contours of a concept are constituted by its components (Deleuze & Guattari, 1994). For Deleuze and Guattari (Bankston, 2017, p. 13), concepts are not "things", but dynamic processes. This can be described as follows:

"... a concept also has a *becoming* that involves its relationship with concepts situated on the same plane. Here concepts link up with each other, support one another ... In fact, having a finite number of components, every concept will branch off toward other concepts that are differently composed but that constitute other regions of the same plane, answer problems that can be connected to each other, and participate in co-creation." (Bankston, 2017, p. 18)

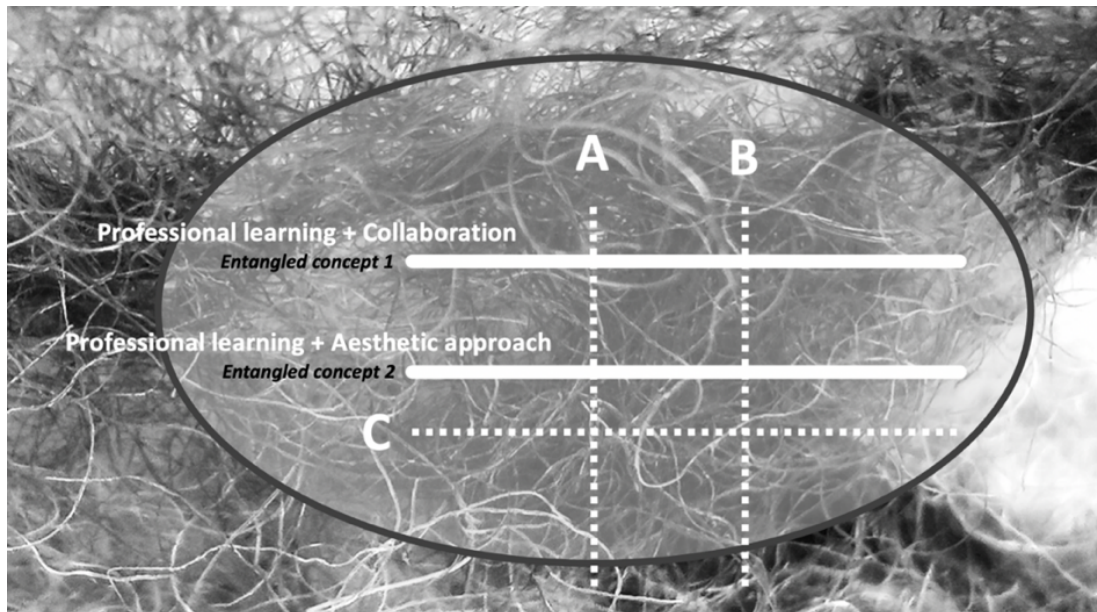
This points to the process in the encounters amongst the concepts of 'professional learning', 'collaboration' and an 'aesthetic approach', which will be traced-and-mapped. These encounters form the lines to be drawn in the cartographic inquiry. In the next section, 'Circles of convergence', the constitution of the map is unfolded by drawing lines, so that the analytic strategy and the review project are unfolded in parallel.

## Circles of convergence

The findings and encounters of three movements are presented, followed by a focus on the researchers' attentiveness, with insight into the creative role of the researcher in such a review process. The three movements are reading rounds for the selected articles, and they follow each other as iterating circles delving deeper into the concepts explored. In Figure 2, three movements, or levels, in the inquiry are exemplified. In these movements, lines are traced-and-mapped that represent an exploration of the encounters of the concepts in the selected articles.

Figure 2

Schematic illustration of the three inquiry movements: first movement (circle), second movement (thick lines) and third movement (dashed lines)



The first movement is the circle in the illustration, as the search strategy for the selection of articles. The second movement consists of the entangled lines, which together are described in the entangled concepts. The connection between two main concepts constitutes an entangled concept; this connection consists of components that are specific to the connection. In the third movement, lines A, B and C cross second-movement lines and with that, they find new connections across the articles. The second and third movements report on the findings for the overarching components which constitute the contours of the entangled concepts (Deleuze & Guattari, 1994).

## Movements - analysis strategy, findings and encounters

### *First movement – assemblage*

The first movement of tracing-and-mapping is the procedure for selection of the articles by searching databases and reading abstracts. This is a molar line, as a broad baseline that connects and maps the more obvious and significant components of collaboration/aesthetic approach/professional learning (Bankston, 2017; Windsor, 2015). The lines on the map are the movements in the process. In this first movement, the line is intentionally drawn quite firmly and constitutes the assemblage. The firmness of the molar line is a consequence of the nature of this review study, being based on empirical research and having specific research aim through which a selection of concepts is explored. In a way, this line might be seen more as tracing than mapping: the stiffness demarcates the area for further mapping. We choose to narrow the area and draw a circle of convergence, instead of opening it.

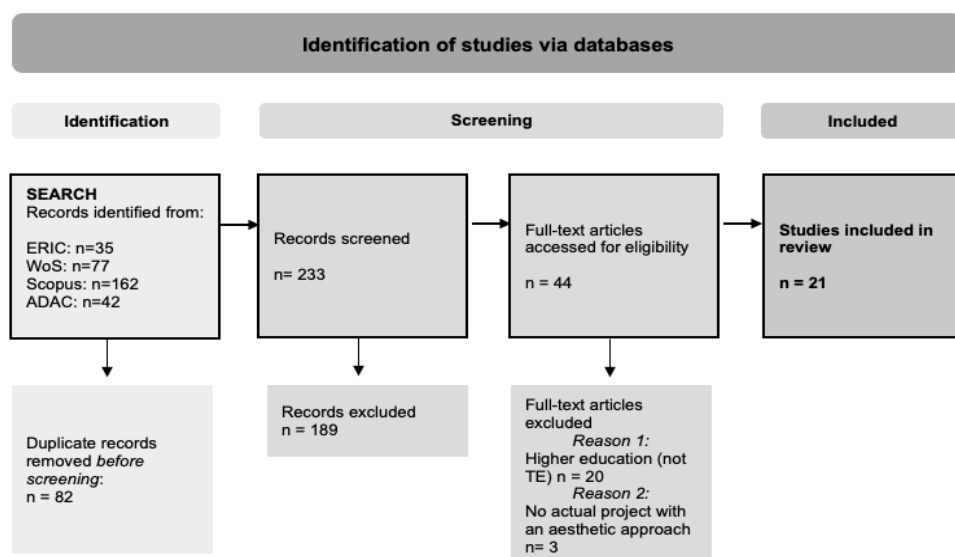
*Constitution of the assemblage of articles – search strategy and selection process.* The systematic



review study by Ping et al. (2018) on teacher educators' professional learning was an entry point for this review. This starting point engages the transversality between the more traditional review search strategy and the use of the cartographic principles of the rhizome in the first movement. The review (Ping et al. (2018) revealed greater attention to research of teacher educators' professional development and learning, and more specifically, their learning activities. However, a focus on an aesthetic approach to collaborative professional learning activities was missing. By taking a cartographic approach to inquiry, we have extended the search area to open up new opportunities. To make this possible, room to find new directions is required. A map, as Deleuze and Guattari (1988, p. 12) describe, "fosters connections between fields ... The map is open and connectable in all its dimensions; it is detachable, reversible, susceptible to constant modification". This means that mapping a selection of studies does not require firm selection constraints; on the contrary, the selection benefits from a broad starting point. The selection should serve the possibility of drawing a map, and we therefore created a plane of consistency (a grid) from which a broad assemblage of studies could be selected (Deleuze & Guattari, 1988, p. 9). In this way, it is possible to map the selected articles as "an experimentation in contact with the real" (Deleuze & Guattari, 1988, p. 12). With this in mind, four databases were used in the search. These included the three frequently used databases in educational research used by Ping et al. (2018): ERIC, Web of Science (WoS) and Scopus. A fourth database, Art, Design & Architecture Collection (ADAC), which does not have a direct link to teacher educator research, but which widens the search field and the possibility of finding articles in which research with an aesthetic approach is presented, was also included. Ping et al. (2018) limited their search to the years 2000-2015. We extended the search to 2021 using the keywords in the abstracts of peer reviewed articles, although in the ADAC database we also searched 'anywhere except full text': ABS ('professional learning' OR 'collaborative learning') AND ABS ('art' OR 'artistic research' OR 'aesthetic') AND ABS ('education') AND PUBYEAR >1999. Figure 3 shows the selection procedure in an adjusted PRISMA flow diagram for systematic reviews.

Figure 3

Selection procedure for the articles used in this review



In total, 233 abstracts were screened and of these, 44 were read in full text. In 21 of the 44 articles, the collaboration partners were connected to teacher education, student teachers and/or schools. The studies by educators in other disciplines were excluded. These 21 articles are those selected for this review.

*Concepts of professional learning and collaboration.* In the 21 selected articles, professional learning is variously pursued, but the connecting characteristic is collaboration. In all the projects, the researchers and participants engaged in collaborative practices, although a few studies do not report on the professional learning from the researchers' collaboration in the project (Berbel-Gomez et al., 2017; Moate et al., 2019). The projects which do mention the researchers' learning do so in different ways, although none of them describe this in the research aim (Fowler, 2001; Gruber, 2019; Harris, 2013; Kouvara et al., 2019; Llull et al., 2018; Staikidis, 2009). Since research is a professional learning activity, we assume that all the researchers use the projects to develop their own practice, but that not all have specifically mentioned this learning as part of the project process. Professional learning is therefore an aim for all those involved in the projects; in their practice they are learning to develop their own and others' professional practices. This collaboration contributes an individual purpose to professional learning, and to the collaborative goal of the development of the profession as a whole (Dengerink et al., 2015, p. 80).

In Figure 4, the articles are selected according to common collaboration combinations of researchers and participants. This layout of *who* is learning *with whom* is used to lead the tracing-and-mapping in the cartographic inquiry in movement two, and to draw the lines of the entangled concepts.

Figure 4

Movement 1 – Who is learning with whom in the studies included in the review

Researchers Projects developed by:	Participants Projects for professional learning for:	Professional learning	Articles	Geographical context
Teacher educators and artists or art educators	Teachers in schools	Arts integration learning Art-based professional learning Artists as creative role models Arts integration learning Creativity in professional learning	Chisholm et al. (2021) Davis (2017) Graham and Hamlin (2014) Martin (2019) Southern (2020)	USA Australia USA Canada UK
Teacher educators and some in collaboration with teachers in school	All for student teachers Some also in collaboration with teachers in school, students in school and/or teacher educators	Professional learning through cooperative learning experience Professional learning through interdisciplinary team teaching Professional learning to expand dialogic space Research as collaborative pedagogical art making Professional learning in cooperative networks Collaborative professional learning for intercultural competence Expression of professional learning for pedagogical development Collaborative professional learning to enable democratic processes Professional learning for 21st century skills	Berbel-Gomez et al.(2017) Fowler (2001) Gruber (2019) Harris (2013) Kouvara et al. (2019) Llull et al. (2018) Moate et al. (2019) Staikidis (2009) Wade-Leeuwen (2018)	Spain USA Austria Australia Cyprus/Greece Spain/Finland Finland/UK/Germany USA Australia
Researchers from different disciplines with school as aim	Teachers in school Students in school	Collaborative process informs professional learning Professional and collaborative learning for new expressive forms	Bowell (2015) Cuthbertson et al. (2007)	New Zealand USA
Teacher educator	Student teachers	Professional learning by circulating knowledge and skills Experiences of creativity as professional learning Pedagogical exploration through professional educational collaboration	Allsup (2011) Meyer and Ellifsen (2017) Shields and Jesup (2017)	USA Norway USA
Teacher in school/Teaching artist	Teachers in school Students in school	Learning and teaching of art in many forms Do-it-yourself professional learning	Rosenfeld (2014) Whelihan (2015)	USA USA

*Concept of aesthetic approach.* Figure 5 presents the activities or operationalisation of the aesthetic approaches used in the studies of the selected articles in this review. These activities

concern the processing of and communicating about experiences, sensations and emotions that are produced in a direct encounter with the world (Austring, 2006).

Figure 5

*The aesthetic approaches in the studies included in the review*



*Towards using the characteristics of the rhizome within the assemblage.* The rigid method of selecting the articles makes this assemblage-constituting line a molar line. As mentioned above, this is the nature of the review study: by following the protocols for conducting a systematic review, the stiffness of the molar line is emphasised. By using search terms in databases, many opportunities to access or belong to the assemblage are blocked, and the rules for selection dominate the drawing of the molar line. This rigidity served the purpose of constituting an assemblage in a review, and now we take the next step, which concerns the articles within the assemblage. The articles are about very different projects, and this heterogeneity fits another characteristic principle of the rhizome: it does not limit connections to those of a similar nature. A cartographic inquiry within this assemblage of studies can create a map, through these lines, for re-thinking professional learning. We intended to extend knowledge and not find the knowledge already apparent in the articles (Sauzet, 2021). Since the obvious is not sought, the map can be constructed by the components of the re-thought concept of professional learning, which is latent in the studies (Deleuze & Guattari, 1988, p. 12; Lenz Taguchi, 2017, p. 703).

### *Second movement – encounter of concepts and literature.*

The second movement of tracing-and-mapping began with a closer reading of the selected articles by using an analytic question. For example, what is the aesthetic approach doing in these texts on professional learning, and how can this be described by components? Here, molecular lines, connecting the texts, form the map in the rhizome. Unlike the molar lines, they do not concern what the articles *are* about, the essentialising question, but rather what the entangled concepts of collaboration/professional-learning and aesthetic-approach/professional-learning *do*, as the processual question (Bankston, 2017; Windsor, 2015). We drew lines within the assemblage (from

movement 1) between the articles by actively using *asignifying ruptures*. Using asignifying ruptures as a characteristic of the rhizome means connecting something different or estranged to find that which was hidden when thinking and reading in the expected paths (Deleuze & Guattari, 1988; Lenz Taguchi, 2016). The connections within an assemblage are constituted by lines: “lines of articulation, segmentarity, strata and territories, but also lines of flight, movements of deterritorialization and de stratification. Comparative rates of flow on these lines produce phenomena of relative slowness and viscosity, or, on the contrary, of acceleration and rupture” (Deleuze & Guattari, 1988, pp. 3-4). This is how the encounter between the selected articles and ‘collaboration’, ‘aesthetic approach’ and ‘professional learning’ forms a map in this review article.

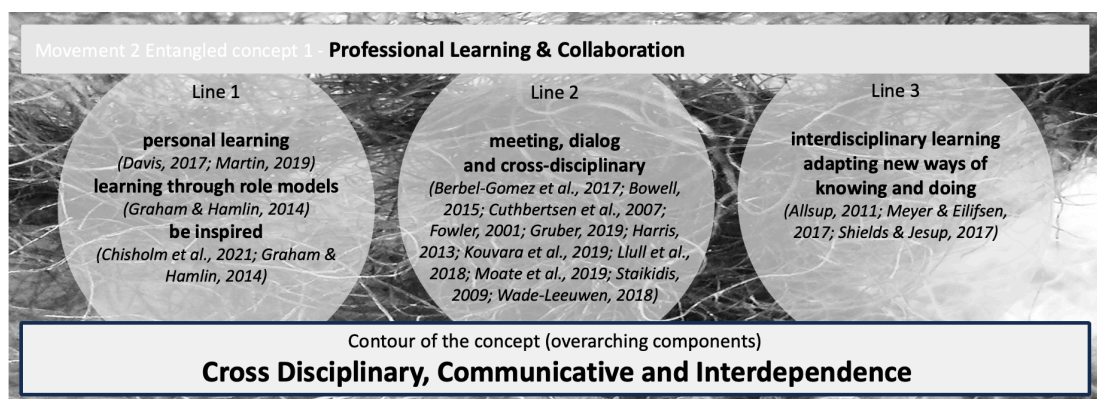
The thick horizontal lines in Figure 2 represent different lines within the concept entanglement of ‘professional learning’ and ‘collaboration’. We direct attention to what happens in the interplay between these concepts; such encounters invoke thinking with the concepts and enable the creation or location of components. In different lines (different connections between articles), we located many different components. Findings on components and practices related to professional learning for both *collaboration* (concept 1) and *aesthetic approach* (concept 2) are illustrated below in Figures 6.1 and 6.2, respectively. These components are characteristic of the encounter of the concepts in the different clusters of articles.

*Entangled concept 1: collaboration – components and practices related to professional learning.*

Figure 6.1 below shows the various components of the lines (lines 1, 2 and 3) within the entangled concept 1 on professional learning and collaboration. The variety of components originates from the different collaborative relations found in movement 1, see Figure 4. The overarching components characterise the entangled concept (the concept’s contours) in all the 21 selected articles in the assemblage. An example of cross-disciplinary collaboration from Harris (2013) is described as ‘peered and tiered learning’. A complex collaboration structure whereby all participants (teacher educators, artists, teachers and students) shifted roles during the project process and in that way supported knowledge transfer at all levels.

Figure 6.1

*Contours of the entangled concept of professional learning & collaboration*



*Contours of entangled concept 1 – collaboration/professional learning.* In the contours of the entangled concept of collaboration/professional learning, the overarching components give insight

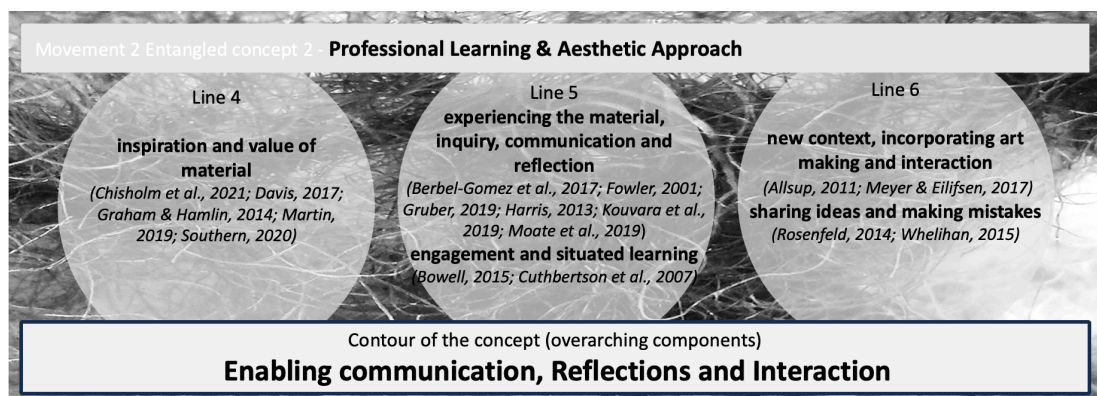
into how professional learning comes to be. This insight emerges from the mapping of this entangled concept. The new materialist instantiation of transversality enables the connections between the concepts within the entangled concept, and this non-dualistic mapping process produces the components, instead of a classification of the components (Dolphijn & Tuin, 2012, p. 111). The researcher's creative experimentation in the mapping process identifies different lines of thought regarding these components in professional learning. These lines of thought can guide the collaborative professional learning processes (Gunnarsson & Bodén, 2021, p. 80).

Different collaboration constellations give different nuances to professional learning. The main divergence is that in some projects, the collaboration produced a learning perspective that was based on *learning from another*. Learning from another concerns communication in the form of inspiration, personal learning, role modelling and adapting new ways of knowing and doing (line 1 in Figure 6.1). Graham and Hamlin (2014) can serve an example here. In other studies researchers and participants based professional learning on *learning as an exchange* as presented by Harris (2013) and Fowler (2001). Learning as an exchange is about communication and interdependence in contexts of *meeting* and *dialogue in cross-disciplinary* environments (line 2 in Figure 6.1). These two processes give insight into the roles of individuals and their perceptions of learning in the professional learning process.

*Entangled concept 2: aesthetic approach – components and practices related to professional learning.* Within the lines of entangled concept 2 on professional learning/aesthetic approach, several lines (lines 4, 5 and 6 in Figure 6.2) were drawn. These lines follow the lines of the professional-learning/collaboration mapping lines, as these articles concern the same professional learning, although the lines connect different articles than in entangled concept 1. Moate et al. (2019) underline the value of the materiality of the reflective sketchbook and how this in itself became part of the reflective process. The teacher educators who initiated this project express learning about a communicative component through the aesthetic approach used.

Figure 6.2

*Contours of the entangled concept of professional learning & aesthetic approach*



*Contours of entangled concept 2 – professional learning/aesthetic approach.* The contours of entangled concept 2, representing what the aesthetic approach produces/does to professional learning, make clear that even though there are different ways of collaborating, the components are still very close to each other. Regardless of the different ways of collaborating, the aesthetic

approach enables communication, reflection and interaction (see Figure 6.2). Through the new materialist approach in this cross-disciplinary entanglement of aesthetics and professional learning, the possible dualistic potential of the different scholarly disciplines of aesthetics and professional learning is not affirmed. The instantiation of transversality in new materialism cuts across these scholarly disciplines (Dolphijn & Tuin, 2012, p. 101). In the process of professional learning, the aesthetic approach enables researchers and participants to become in relation to each other and the content of the project.

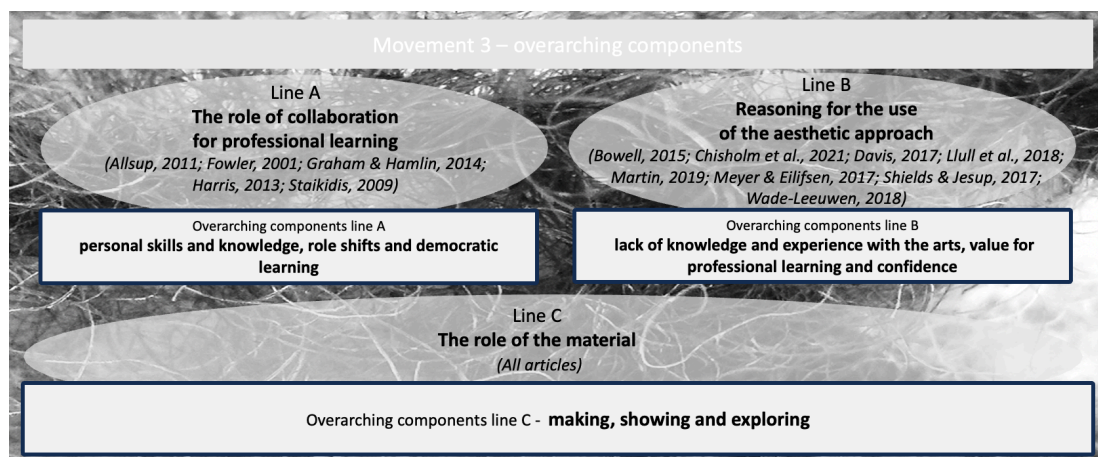
### *Third movement – more doings in the interplay of articles*

The third tracing-and-mapping movement shows lines which cross lines from the second movement and bind together articles that were not previously connected (see the dashed lines A, B and C in Figure 2). The lines can be seen as lines of flight which, through an asignifying rupture, burst out of the lines from the second movement to show the change of perspective and find new components. In this way, a line occurs which maps more complex forms of collaboration and the roles the researchers and participants play in that complexity. These lines are called A, B and C to distinguish them from the lines in the earlier second movement.

Line A, for example, shows components that influence professional learning when collaborating in a complex collaboration structure (see Figure 6.3). In Fowler (2001) collaboration was between students, student teachers, a school teacher and an university based teacher educator. Interdisciplinary team teaching, in a project about redesign of shoes where different sources of expertise are in parallel with each other, is described as a meaningful learning experience.

Figure 6.3

*Components of the connectivity between professional learning and the role of collaboration, reasoning for using an aesthetic approach and role of the material*



*Connections in line C – the role of the material.* Of particular interest is that none of the projects with a complex collaboration design used an aesthetic approach in an instrumentalised way for professional learning. Even though this splits the assemblage of articles, all 21 are still connected through the role of the material. The new materialist perspective on the interplay between the human and the more-than-human is in focus here (Taylor, 2021). The material is not a passive social construction for producing knowledge of what this connectivity can do in an aesthetic

approach to a collaborative professional learning activity (Gunnarsson & Bodén, 2021, p. 11). A new materialist perspective allows the researcher to study different dimensions of this entanglement: matter, meaning, creation and form (Dolphijn & Tuin, 2012, p. 91). Material used in the aesthetic approach is active and enables *making or creating* and *showing and exploring* in professional learning activities (see Figure 6.3).

### **In between movements – the role of the researchers' attentiveness in decisive moments**

As researchers we constantly create through our exploration. This cartographic review unfolds the circles of convergence through the three movements. In between the lines of the three main movements we found a "slender line" of decisive moments (Deleuze & Guattari, 1988, p. 122), where the doings of the post-qualitative researcher and the thinking with theory that a cartographic approach to a review implies, became clear. The following paragraph describes two decisive in-between moments.

This slender line shows processes of becoming, which start in the middle of the main lines in a rhizome and shows the becoming of a cartographic review and of entangled concepts. The slender line is characterised by the researcher's ethical gaze, actions and responsibilities for what is produced as new knowledge (Gunnarsson & Bodén, 2021; Østern et al., 2023; Taylor, 2021).

#### *Drawing land locating new lines*

Being in the middle of two movements in this cartographic review, before knowing where to start to draw the next lines, is "a transversal movement that sweeps one *and* the other way, a stream without beginning or end that undermines its banks and picks up speed in the middle" (Deleuze & Guattari, 1988, p. 25). To pick up speed on the way to the second movement, we use this process of transversal movement in a perpendicular direction, as Deleuze and Guattari (1988) describe it. To find our way in the rhizome, to know which line to draw, reading the abstracts would not be enough to be able to map the lines of the concepts. Instead, using the full texts, the concepts as a whole could be described, and we picked up speed to find the direction and clarification of the lines. While reading through the texts, we looked for relatedness of the concepts of 'professional learning', 'collaboration' and 'aesthetical approach', and these moments became the lines we drew. These relations were sensed (Jackson & Mazzei, 2023). To know what line to draw, we needed constant attentiveness and to ask "what is it we do here? Which trace do we follow? Which borders do we insert or cross?" (Gunnarsson & Bodén, 2021, p. 79; Spindler, 2013, pp. 179-180). Attentiveness is invoked by an encounter with the real, and forces us to think and give form to the mapping (Deleuze, 1994, p. 139; Jackson & Mazzei, 2023, p. 139). We see the creating role in this process as a way of not following too rigid a line, and of being attentive to turning points, or to points that might be possible crossroads. When one text folds onto another, it can constitute new lines to follow (Deleuze & Guattari, 1988, p. 6).

Another decisive moment of in-between was induced by reading the 21 articles in the second movement. This second in-between moment is characterised by a second level of attentiveness, a moment in the process that does not necessarily stop a process and get it going again, but can be

an ongoing parallel process. This is a moment where it is possible to locate a new line to draw. The molecular lines in both the second and third movements form the emergence of something which is not perceptible at first sight (Deleuze & Guattari, 1988). The ambiguity which can arise in the in-between moments benefits from the suppleness of the molecular lines. The researcher's attentiveness and experience help to make the 'doing' of the aesthetic approach perceptible. In-between moments are crucial ethical moments that give space for researchers' critical and creative senses. This new transversal movement opens space for an overview, forcing the researcher to increase attentiveness and enter the assemblage with new thoughts from the articles and theory. This leads into a new movement and can be seen as an asignifying rupture; an attempt to see something which is hidden in the lines already drawn, as a change of perspective that provides new ways of thinking and reading (Deleuze & Guattari, 1988, p. 9). By using theory to think with, more specifically while following the slender line, this cartographic review made it possible to find the two levels of interplay. The dynamic of thinking with theory, where one is pulled to a macro view and back again, made it possible to map and find the molar, molecular and slender lines that showed new directions in which to find knowledge (Jackson & Mazzei, 2012, p. 12).

As a researcher in-between movement, attentiveness leads to directions in the process, which helps to find connections in the rhizome and build foundations for furthering the process. The transversal movement of the in-between moment changes pace and creates a space of attentiveness in reflection (Deleuze & Guattari, 1988, p. 25).

## Unfolded encounters

By exploring what an aesthetic approach does and/or produces in a collaborative professional learning process, we unfolded the process of a cartographic approach to performing a review. By experimenting with cartography as an approach to inquiring literature, we extended knowledge by opening up new knowledge pathways. Here, knowledge emerged in the encounters of concepts and the selected articles. Through these encounters we found that an aesthetic approach to collaborative professional learning can make researchers and participants aware of their perceptions of learning and their role in it, while enabling relations to one another and the project. Using an aesthetic approach enables connections within the process of professional learning, while the material used in the learning activities deepens the experience. As the encounters indicate, we found new directions through the contours of the entangled concepts.

Another exploration to unfold through cartographic review is the use of the starting point from an earlier study of teacher educators' professional learning (Ping et al., 2018). This is a regular aspect of performing a traditional literature review and is seen as a way of validating the new study (Booth et al., 2022). Conversely, the goal of post-qualitative inquiry "is not to systematically repeat a pre-existing research process to produce a recognizable result but to experiment and create something new and different ..." (St. Pierre, 2021, p. 6). Including transversality in the theoretical framework allowed for an exploration of paradigms in one study which negated "any obligation to follow hierarchies (classifications) in organizing thought, objects, or living organisms (including humans)" (Tuin et al., 2022, p. 199). The encounter with the traditional review method and



cartography as a starting point used in movement 1 helped to constitute an assemblage, leading to in-depth inquiry that was facilitated by thinking with theory. This gave a clear point of entry in the rhizomatic analysis strategy in movements 2 and 3, giving autonomy to experimental and creative approaches that post-qualitative inquiry makes possible, and which in turn contribute to extending knowledge in new directions.

In the final part of this article, we unfold thoughts on using the cartographic principle of the rhizome in a literature review to find more new directions, and where these new directions and the extended knowledge can lead.

## Doing and becoming in new directions

### *Disrupting the process*

A pivotal moment in mapping is the convergence of circles wherein iterating movements in the cartographic review cause the rhizome to become very tight. This is also a critical point in the review process. Going further in circles of convergence would narrow the view of professional learning. It is as if the felted wool in Figure 1 were to be further felted: through the converging process of the iterating movements, it becomes more difficult to distinguish all the small woollen threads, and the wool becomes so dense that the tight connectivity makes it vast, instead of open and accessible. The contours of the entangled concepts are constituted by components, and these components are multiplicities; they can contribute to different contours of concepts (Deleuze & Guattari, 1988, p. 11). The 'communication and reflection' component in line 5, for example, is a component in many of the articles mentioned in that line (see Figure 6.2); and in the connectivity of entangled concept 1 (see Figure 6.1) is important in relation to the finding about *learning as an exchange*. This illustrates that components 'do' differently and have different roles in different contexts and concepts. Multiplicity as a characteristic principle of the rhizome can find new points outside the circle of convergence and in that way find a new direction. The findings and knowledge insights emerging in encounters in a cartographic approach to a review open up future discussions on an aesthetic approach to professional learning and offer a deeper consideration of what activating *becoming in relation* might bring forth.

### *Becoming-professional*

By mapping the concepts through drawing molecular lines, different components of these concepts were located, and new components emerged. This is the process of becoming through the line which passes between (Deleuze & Guattari, 1988, p. 293). The process of teacher educators' professional learning, which might enable them to develop approaches to education and meet the request to focus on critical thinking and creative learning processes in schools (Harris et al., 2018), is a process of becoming-professional.

The process of teacher educators' professional learning can benefit from the new perspectives found in this review, but the discussion needs to reach out to new directions in the rhizome, and not, as in this review, proceed further in circles of convergence. A cartographic review thus presents a map from where we can find new orientations in the inquiry into teacher educators'

professional learning (Deleuze & Guattari, 1988). To enable accessibility and the continuity of the knowledge-ing process which became visible through this review (Taylor, 2021), we want to support further inquiry and exploration of *an aesthetic approach to becoming-professional*. By connecting to the concept of becoming, a line of flight will be created to lift the findings from the dense connections of the context of the review into the rhizome. A line of flight is drawn from this asigned rupture out of the assemblage. Becoming as a dynamic concept is influenced by the heterogeneity principle of the rhizome (Bankston, 2017, p. 182). Becoming is connected to many other concepts and things of a different nature. It opens up, and the entangled concepts are easier to access from outside the confined context of the 21 articles. By connecting to the concept of becoming and the newly found contours, we create space for new orientations of thinking (Deleuze & Guattari, 1994). *Becoming professional* implies a continuous process which opens up and invites exploration and the establishment of new connections. A continuing inquiry opens up new knowledge pathways for an aesthetic approach to becoming-professional.

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### Authors' contributions

Juliette Boks-Vlemmix designed and carried out the study and drafted the paper, with support from Jessica Aspfors as PhD supervisor. Juliette and Jessica discussed the manuscript through several iterations before both authors agreed on the final manuscript.

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### Figures

- Figure 1: Rhizome, illustrated by a close-up picture of felted wool (Boks-Vlemmix, J. own work and photo, 2021).
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- Figure 6.1: Contours of the entangled concept of professional learning & collaboration.
- Figure 6.2: Contours of the entangled concept of professional learning & aesthetic approach.
- Figure 6.3: Components of the connectivity between professional learning and the role of collaboration, reasoning for using an aesthetic approach, and role of the material.