Chapter 4
Examining the Complexity of the Out-of-Field Teacher Experience Through Multiple Theoretical Lenses

Linda Hobbs, Anna E. du Plessis, Frances Quinn and Emily Rochette

Abstract This chapter will draw on and interrogate a range of theoretical approaches to examining teachers' experiences of teaching across specialisations. Teaching is a complex work, but teaching a subject without the necessary background presents its own set of challenges, both practically in the classroom and personally for the teacher. Different theoretical perspectives highlight different aspects of the experience. Four theoretical perspectives will be explored for their emphasis on where the individual teacher is placed within and how they negotiate the intersection of their practice, sense of self and the social and cultural context. The four theoretical perspectives will include Positioning Theory, Cultural Historical Activity Theory, Boundary Crossing and Lived Experience. The chapter will use research from the authors to illustrate the explanatory power of these theories in understanding the experience of teaching across subjects.

Keywords Teaching out-of-field · Teaching across specialisations
Cultural-historical activity theory · Boundary crossing
Epistemological perspective · Context-consciousness · Lived experience
Positioning theory

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4.1   Introduction

In this chapter, we examine a number of theories that have been used to examine teachers' experiences of teaching out-of-field. Teaching is a complex work. Teaching out-of-field, that is teaching a subject or year level that is outside of their area of expertise or specialisation, adds additional layers of complexity that have implications for the teacher personally, practically and socially. Researchers can examine this phenomenon at a technical level, such as through quantification of the incidences of out-of-field teachers based on qualifications and subjects studied at universities—these are valuable for highlighting the extent of out-of-field teaching (see, for example, Chap. 2). The effect of teacher characteristics on the student experience remains as an important question for researchers, practitioners and administrators, although, as described in Chap. 8, meaningful comparisons and correlations between teacher qualifications with student achievement can be difficult to establish definitively. Other variables can be used to examine the effects on the individuals in ways that cannot be established through correlations between test scores and measurable teacher attributes. Complex social issues, such as teaching out-of-field, can be more deeply understood through the lens of theory, rather than through the so-called 'gold-standard' level of research promoted through federally funded educational research, that of randomised control trials and experiments (Dimitriadis 2008). Socio-cultural theoretical frameworks can shed light on this phenomenon at a deeper level by paying attention to such things as effects on individuals, relationships and interactions between different players, effects of context, and acceptance or rejection of responsibilities and actions.

Given the complexity of the out-of-field phenomenon, what people choose to attend to when attempting to research and understand this issue is influenced by the theoretical stance from which they look. Their choice of theory is in turn influenced by what story they want to tell about a particular part of the research problem. It is beyond the scope of this chapter to examine the different interpretations, uses and forms that theory takes in qualitative research. Suffice to say that in qualitative research, theory can be thought of in multiple ways and can be useful at different points throughout the research process (Anfara and Mertz 2015). On the one hand, theory can be conceived of as a means for 'thinking otherwise' (Ball 1995), allowing us to 'open up spaces for the invention of new experiences' (Adams, Cochrane and Dunne 2012, p. 2). On the other hand, theory carries a point of view, and therefore informs the choice of events or experiences to include in the analysis (Anyon 2008): 'one does not go into the field to "see"—one goes into "look" for various sorts of patterns and themes' (Anyon 2008, p.4). In this chapter, theories are applied to research as 'lenses' through which to study the phenomenon of teaching out-of-field (Anfara and Mertz 2015).

Drawing on Anfara and Mertz (2015), using a theoretical framework has the effect of: organising and focusing research on particular aspects of the phenomenon; revealing and concealing meaning and understanding due to the productive constraints associated with the theory; situating the research within a scholarly discourse by

providing a language to articulate the phenomenon in ways that might be useful for furthering our theoretical and practice understanding; and revealing the limitations of the theory and signalling a need for additional theories to help highlight other aspects of the phenomena. Choosing a suitable theory is, therefore, influenced by those aspect of the out-of-field phenomenon that the researcher wishes to illuminate.

Within social research, there are a plethora of theories that can be applicable to an analysis of the out-of-field phenomenon. Anfara and Mertz (2015, p.6) classified theories into four categories focusing on the following:

1. Individual: an individual's development, cognitive behaviour, personality, learning and interpersonal interactions;
2. Organisation: bureaucracies, institutions, organisational structures and function, and organisational performance;
3. Group: family issues, work teams, employer-employee relations, interpersonal networks; and
4. Social: group behaviour, cultural institutions, urban development

All four types of theory are relevant when examining the out-of-field phenomenon. 'Individual' theories can be used to focus on individual teacher and student learning, and teacher content and pedagogical content knowledge in relation to teacher standards and competencies, for example, the effect of learning to teach a new subject could be examined through cognitive behaviour theories or self-efficacy theory. An examination of the effect of out-of-field teaching on student achievement and school performance generally, teacher recruitment and allocation practices, or system level analyses could use 'organisation' theories. 'Group' theories can focus on the effects of the whole school staff, or examine the networks that teachers draw on to support their learning. 'Social' theories can examine the teacher in the context of school culture or community, and identify the various actors or participants that might be involved, impacted upon, or perpetuate the need for out-of-field teaching.

The four lenses in this chapter largely focus on the teacher as the unit of analysis: teachers' experiences, the teacher in context, the teacher and their roles and identities, other peoples' perceptions and experiences relating to the teacher and their work, influences on the teacher, and teacher in relation to others. The first lens, Positioning Theory (from Harré), is a theory focused on the individual, analysing the discursive practices of the teacher to better understand his/her interpretation of the social, cultural, and historical facets of the local moral order. The second and third focus on the teacher as they move between two fields: Cultural Historical Activity Theory (CHAT) (from Engeström), which considers the teacher as part of a system of interactions and activity, and boundary crossing (from Akkerman and Bakker 2011), which focuses on the learning mechanisms that arise as a result of the boundary. CHAT accounts for the system within which the teacher operates and could be considered a social theory, while Boundary Crossing focuses on the individual learning of the teacher, although the theory acknowledges that the individuals are part of a cultural setting. The fourth perspective illustrates how multiple theories relating to Lived Experience (Gattamer, van Manen, Vygostsky) can be used to analyse teacher experiences and their effects on the teacher and others involved in this complex phenomenon. This

lens is informed by two theorists that focus on the individual and their experience as well as the social theory of learning by Vygotsky. This fourth lens illustrates how the use of complementary multiple theories can provide a more complex analysis of the out-of-field phenomenon.

The following sections describe each of these theories, their explanatory power when used to understand the out-of-field phenomenon, illustrate their application with some data, and provide a critique of the strengths and limitations in understanding this research problem. This juxtaposition of theoretical lenses serves to highlight the relative usefulness and limitations of the different theoretical lenses, that is their explanatory power when exploring the out-of-field teaching. By focusing on the teacher as the unit of analysis the chapter also serves to highlight, from different theoretical perspectives, the complexity of teaching out-of-field.

4.2 Positioning Theory[1]

Positioning theory originated from a social constructionist epistemic tradition (Harré and van Langenhove 1999; Howie and Peters 1996). Informed by the philosophies of Vygotsky (1962, 1978) and Wittgenstein and Anscombe (1953) positioning theorists take an interpretive theoretical perspective where reality is conceived of as dynamic, changing moment-to-moment in conversational acts. Descriptions of the social world are possible and positioning theorists acknowledge that they are numerous and dependent on an individual's identity (Harré and van Langenhove 1999). Figure 4.1 introduces the positioning triad which can be used to better understand individuals' perceptions and interpretations of the social, cultural and historical facets of the local moral order; the system of rights and duties within which intentional acts are done (Davies and Harré 1990; Harré and Slocum 2003; Harré and van Langenhove 1999).

A *position* is accepted to be an interpretation of a cluster of rights and duties that permit or forbid individuals from performing actions that might be deemed significant. As individuals are actively and dynamically positioned they sense and understand that they have a repertoire of acts to negotiate social episodes (Harré and Moghaddam 2003). A mis-/match between what is said and done may indicate how an individual has perceived and understood their agency. Harré (2012) reminds us to avoid presuming symmetry between our self-identified rights and another's duties. As a teacher, it is my duty and right to assign homework to students. Depending on my students' perceptions of their personal agency, however, they may publicly or privately reject my duty and fail to complete their homework, thus repositioning themselves.

Discursive practices, or speech acts, include the speaking or writing of words and non-verbal symbolic exchanges (Davies and Harré 1990; Harré and van Langenhove

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[1]Section 4.2 by Emily Rochette. We acknowledge the contribution of Christine Redman (University of Melbourne) and Paul Chandler (Australian Catholic University) to this section.

Fig. 4.1 The Positioning Triad (Adapted from Harré and van Langenhove 1999)
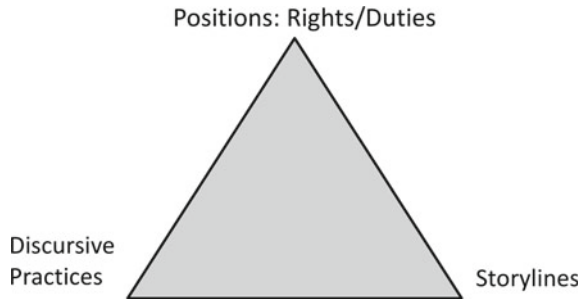
1999) indicative of the ways people do things and the meanings ascribed to their actions (Harré and Moghaddam 2003). Discursive practices possess illocutionary forces (Austin 1975) where the meaning of what has been said or done lies beyond the meanings of the words themselves. The illocutionary forces of speech acts depend on the local moral order within which they have been spoken, written or performed and are evident when seen to permit or forbid a person to act as individuals interpret the conversation. A deadline set by the chief executive officer of a company will have a very different illocutionary force for an employee than a deadline set by his 5-year-old daughter, for example, Pronoun grammar analysis (Redman and Fawns 2010) refers to considering pronouns, like *I* or *we*, and contributes to a fine-grained analysis of speech to understand an individual's sense of dis/affiliation in a group (Tan and Moghaddam 1999). Identity, therefore, becomes a product of an individual's interpretation and acceptance or rejection of interpersonal actions (Harré and van Langenhove 1999). In the example above, a student may reposition herself by rejecting the duty to complete homework by a certain date: *I've got dance lessons tonight, so I'll do Monday's homework on Wednesday.*

Storylines arise and are influenced by the history of interactions and events. They emerge from the discursive practices and positions assigned to but also accepted or rejected by individuals (Redman and Rodrigues 2008). Storylines can reflect not only an individual's interpretation of his or her rights and duties but also his or her interpretations and acceptance of others' rights and duties (Redman 2013a). The storyline emerging from the example above could be called *the responsible student*. A busy extra-curricular schedule has enabled the student to claim the right to organise her homework time as she sees fit. Rather than rejecting the duty to complete homework altogether, the responsible student does it on another day. The plot in this storyline may shift depending on whether or not the teacher accepts or rejects the student's repositioning.

4.2.1 Application of Positioning Theory to Teaching Out-of-Field

To the best of our knowledge, application of positioning theory explicitly linked to the out-of-field teaching context seems to be an under-explored area of research in peer-reviewed literature. However, positioning theory has been used across several areas of education including understanding midwifery students' identity formation (Phillips et al. 2002; Phillips and Hayes 2006, 2008), beginning teachers' socialisation processes (Tan 2015), dyslexic tertiary educators' professional identities (Burns and Bell 2011) and understanding habitus and capacities as teachers engage with a website as a teaching tool (Redman and Rodrigues 2008). This list of some of the applications of positioning theory in education research highlights a central theme worth exploring in the out-of-field teaching context: identity formation.

Hobbs (2013a) suggests that situations like out-of-field teaching provide opportunities for teacher identity expansion and re-conceptualization of teaching practice. One strength of positioning theory is that it provides an alternative framework to the static concept of role (Davies and Harré 1990; Harré and van Langenhove 1999). An individual's perceptions of his or her position, and associated rights and duties, may shift as the social situation unfolds. Applied to out-of-field teachers, positioning theory can be used to understand and track changes in teacher identity formation and perceptions of personal agency as they negotiate unfamiliar curricular contexts. This research is significant as it contributes to better ways of teaching students by understanding the constraints and benefits that out-of-field teaching creates.

4.2.2 Interpreting Mary's Out-of-Field Geoscience Experience Through the Positioning Triad

In the Australian state of Victoria, general science teachers are expected to instruct year levels from 7 to 10 students across biology, chemistry, geoscience and physics (Victorian Curriculum and Assessment Authority VCAA 2015). Geoscience is the study of Earth's physical structures and processes acting on them and, internationally, is largely taught by general science teachers without a degree in Geoscience (King 2008; Lewis and Baker 2010). Victorian teachers are also expected to develop students' understanding of contemporary scientific practices through inquiry-based pedagogies that use digital technologies (VCAA 2015, 2016). The digital technologies curriculum standards add to the complexity of the out-of-field teaching experience because educators are assumed and expected to know *of* and *how* to employ digital technologies for geoscientific inquiry. How do secondary science teachers negotiate teaching geoscience out-of-field while using digital technologies?

Mary is a trained general science and senior chemistry teacher. By 2016, she had taught 8 years at Riverside High, a Melbourne secondary school known in the local community for providing high-quality education. Prior to her teaching career, Mary

Table 4.1 Mary prepares for a year 8 geoscience rocks and minerals unit

Line-by-line coding	Interview transcript	Story line
Teacher self-identified duty to re-learn material Teacher self-identified duty to know material at a deeper level than the students Teacher-identified student right to have questions answered	And so, I then re-learnt-it's not like I was going into it and I was reading the information and going: 'I don't have any understanding of it.' But it's-you can't be at the same level as the kids when you teach the kids. You've always gotta be that one bit higher. 'Cause then how do you answer questions?	The accountable out-of-field geoscience teacher who may not fully understand what she is meant to teach

Table 4.2 Mary's perceptions of digital technology use in science

Line-by-line coding	Interview transcript	Story line
Teacher self-identified duty to use digital technologies in science class Teacher self-identified duty to engineer pedagogically valuable experiences for students with digital technologies Teacher self-identified duty to develop curriculum that 'adds value' to learning experiences	I didn't want to sound like I don't use them 'cause I do, but I just think that with every, um, process of using a technology in class, there's a lot of thought that goes on behind it that I don't think anyone ever… I don't think anyone kind of gets up and goes: 'Ah, I'm just gonna use this technology just for the sake of using it.' There's a lot of thought that goes on behind it because we spend so much time developing curriculum that we then wanna make sure anything new that we introduce value adds to that	The accountable teacher with digital technologies who understands and accepts the challenge of teaching with digital technologies

completed an honours degree researching fluorescent chemical compounds. Despite identifying as out-of-field in geoscience, Mary's skills using digital technologies for her chemistry research might prove useful for her geoscience classroom practice.

Some of Mary's interview data is closely examined here to better understand the out-of-field geoscience teaching experience. Tables 4.1 and 4.2 present data analysed line-by-line (Charmaz 2014) and use the positioning triad to bring to the fore the emergence of storylines.

In Table 4.1, Mary shared how she began planning to teach a geoscience unit of work for her year eight class for the first time in 2015. Mary's use of *I* is indicative of

her personal duty to re-learn the material and she justified her actions by identifying her duties as an accountable teacher who is acting responsibly.

The data in Table 4.2 data was collected at the end of an interview when I asked Mary if she felt there was anything about her experiences that I should know or understand better. Mary continued the accountable teacher storyline reflecting on digital technology use in science. For Mary, digital technologies that added value were those that provided students with problem-solving scenarios. Even though Mary would have used digital technologies to this effect in her honours laboratory work, Mary reflected that in her science classes digital technologies were mostly used after scientific theory was explicitly taught.

This and other interview data suggested that although Mary and her colleagues may assume the duty to incorporate digital technologies into their lessons, their abilities to do so may not reflect the intentions of state-mandated curriculum or even their own understandings of best practice. Earlier in the interview, Mary explained:

> In material that maybe I'm new to teaching […] I find that I need to have almost a bit of a traditionalist approach (nervous laughter) to begin with so where you're more in control, 'cause I think that there are some parts of using digital technologies where you relinquish the control […] and that I wanna-I wanna make sure that they're [students are] getting everything that I want them to […] understand […]

At this school, the 'traditionalist approach' seems to be a common practice where teachers use Microsoft PowerPoint to deliver content as students take notes. Mary's nervous laughter suggested this approach may be disconnected from what she feels to be best practice developing her students' science inquiry skills as required by state-mandated curriculum.

4.2.3   Critical Analysis of Positioning Theory

Positioning theory has been applied to students, teachers and researchers in science, technology and mathematics education for some time. Examples include Jakab (2013), Redman (2004, 2013c), Roe (2015) and Herbel-Eisenmann et al. (2016). Although positioning theory has been used as a powerful analytical tool, some aspects of positioning theory require critical analysis to better understand the wider application of it.

Herbel-Eisenmann et al. (2015) bring our attention to linguistic uncertainties arising from the synonymous use of the terms *position* and *positioning* within Harré and van Langenhove (1999). A position is considered to be an object and positioning a process (Harré and van Langenhove 1999). More recently, position has been defined in terms of rights and duties (Harré 2012; Harré et al. 2009; Moghaddam et al. 2008). Herbel-Eisenmann et al. (2015), however, point out that the earlier work of positioning theorists is most often used in mathematics education, and thus may continue to promote misunderstandings of these terms. Teaching out-of-field is a dynamic space where teachers negotiate unfamiliar content and pedagogical practices, their duties

to their students and their capacities to attend to these duties. Theories are conceptualizations of our interpretations of the world, and thus evolve with new insights and understandings. When using the *position* construct, researchers may want to define it in terms of rights and duties while highlighting that positions change moment-to-moment thus enabling us to better understand teaching out-of-field as a complex and dynamic experience for the individual.

Another shortcoming of positioning theory pointed out by Herbel-Eisenmann et al. (2015) is the apparent lack of text about storylines. Although Herbel-Eisenmann et al. (2015) acknowledge that storylines can be referred to in a variety of ways, including narrative and narrative convention, these authors suggest that there is no way of establishing a 'correct' storyline and point out that within a social episode, multiple storylines could be at play. Positioning theorists acknowledge the existence of multiple storylines, see for example, Harré and Dedaic (2012) and Harré (2012). From our perspective, referring to storylines as narratives and narrative conventions are seen as an opportunity to marry positioning theory with other theoretical perspectives.

Positioning theory is a useful methodology to understand teachers' relationships to influences from the broader institutional setting (Redman 2013b, p. 271). Clandinin and Connelly's (1996) cover, sacred and secret stories can be powerful when paired with positioning theory to make sense of the complex and dynamic professional landscape teachers navigate. Cover stories are those that might be promoted by school administrators to the wider community: *Our school provides technologically advanced learning spaces and teachers utilise these to teach science inquiry with digital technologies*. Sacred stories, however, are the theory-driven view of professional practices shared by teachers, policymakers and theoreticians: *Mary is an accountable out-of-field geoscience teacher who seeks to utilise digital technologies to add value to her inquiry lessons.* Secret stories, often more personal and individual, are about classroom practice that can indicate tension with cover stories: *Mary is unsure how to teach geoscientific inquiry with digital technologies.*

One of the strengths of positioning theory is providing an alternative to role. Role is a static concept, represented on paper in written contracts and policy documents. State-mandated curriculum requires general science teachers to teach across year levels 7–10 and also across biology, chemistry, geoscience and physics while incorporating digital technologies into classroom practices. Using Weldon's (2016) definition of in-field to categorise teachers as in-/out-of-field may not represent the complexity of the professional landscape Victorian general science teachers are expected to navigate. For Weldon (2016) in-field teachers have the following:

1. Studied a subject for at least one semester at second-year tertiary level with no tuition in subject-specific teaching methodologies; or
2. Met the criteria for 1. *and* were instructed in subject-specific teaching methodologies.

Although Mary would be considered an in-field general science teacher, her role as presented in state-mandated curriculum documents seems to assume Mary's capability to teach across all sciences incorporating digital technologies. The value of positioning theory lies in demonstrating how teachers' perceptions have become

reified and discursively active (Davies and Harré 1990; Harré 2002). The tension between Mary's sense of professional responsibility to use digital technologies to teach science inquiry skills and her confidence to do so by relinquishing control in out-of-field areas of the curriculum have been brought to the fore in our conversations. Using positioning theory, researchers begin with individuals' self-perceptions to understand how they re-/negotiate their rights and duties through their experiences. In this way, positioning theory enables researchers to better understand what it means to be teaching science out-of-field.

Finally, although not formally labelled as a methodology in handbooks of qualitative research, positioning theory has been shown to philosophically and methodologically complement Charmaz's (2014) well-established constructivist grounded theory methodology (Rochette et al. 2017). The example of Mary demonstrates how line-by-line coding (Charmaz 2014) procedures could be initially employed to begin to understand out-of-field teachers' perceptions as they negotiate uncharted curricular landscapes. Grounded theory coding procedures can be used further to build a conceptual framework for professional development that may challenge and scaffold out-of-field teachers' pedagogical capacities.

4.3   Cultural Historical Activity Theory[2]

Cultural Historical Activity Theory (CHAT) is a conceptual framework, emanating from the work of Russian cultural-historical scholars in the 1920s and 1930s, that has been applied to the analysis of a range of human activity systems, including education. Vygotsky (1978, 1981; cited in Engeström 2001) posited that human activity is object-oriented, involves a dialectical relationship between a subject (an individual), the object (goal of action) and is mediated by cultural artefacts such as tools and signs. Leontiev (1981) and subsequently Engestrom and colleagues (e.g. Cole and Engeström 1993; Engestrom 1987) extended this initial focus on individual actions to encompass the collective object-oriented activity of humans in social contexts, the multiple social mediators of activity such as culturally and historically located rules, patterns of division of labour, and the wider community involved. In multiple publications (e.g. Engeström 2001, p. 135), the collective activity system is depicted as a series of interlinked triangles (Fig. 4.2) representing the interactions between the different elements of the system, which become the focus of analysis of activity.

Drawing on the work of seminal activity theorists (Cole and Engeström 1993; Engeström 1990, 1998, 2015; Engeström and Sannino 2010; Leontjev 1981), elements of the activity system in a traditional western secondary classroom might be described and exemplified as follows:

- Subject: The subject is the agent from whose perspective the activity system is being viewed. This may be the teacher, other individuals engaged in the activity

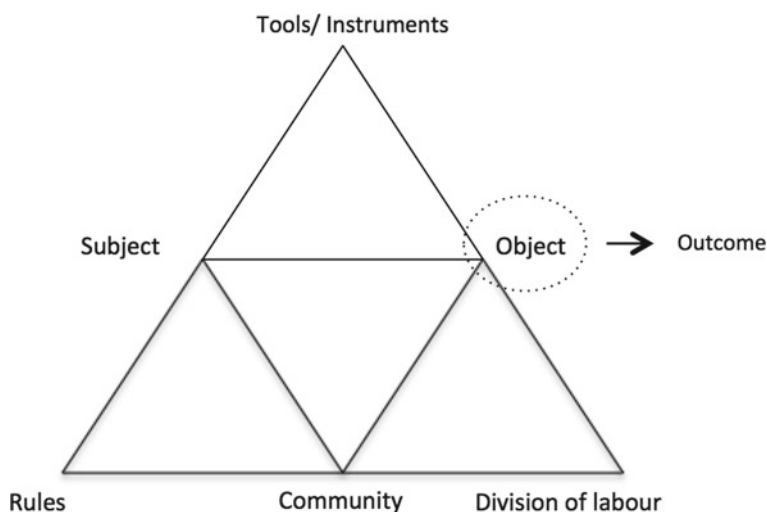---

[2]Section 4.3 by Frances Quinn.

Fig. 4.2 The structure of an activity system (after Engeström 1987, p. 78)

system such as a student, or groups of teachers such as the science or mathematics staff.

- Object: The object of activity is fundamental to the CHAT conceptual framework, in a sense defining the activity. It relates to the motive and purpose of the activity (Engeström and Sannino (2010, pp. 4-6), with some researchers highlighting the complexity and ambiguity of multiple motives comprising 'a complex and contradictory assembly of entities embedded in economic, social and power relationships…' (Kaptelinin and Miettinen 2005 p. 2).
- Tools: These are the instruments, artefacts or 'cultural resources' (Engeström and Miettinen 1999) that mediate the activity, such as textbooks, syllabuses, prior knowledge, classroom activities and forms of representation such as images and models (Engeström 2015, p. 201; Yamagata-Lynch and Haudenschild 2009, p. 508).
- Rules: These prescribe acceptable behaviours via formal school policies and regulations and broader social and school expectations and norms (Engeström 2001), such as the expectation that teachers are competent to teach their subject area.
- Community: The community comprises other individuals in the activity who are involved with and share the same object, so may include the students in the classroom, the head teacher and colleagues in the staffroom.
- Division of labour: This relates to the way that the tasks, powers, responsibilities and rewards associated with the activity are distributed among the participants of the activity system (Cole and Engeström 1993, p. 7).

The more recent third generation of Activity Theory recognises that activity systems are interlinked, interact with and influenced by other related systems. Interacting activity systems with a partially shared object become the units of analysis

(Engeström 2001). Contradictions and tensions can occur within and between elements of activity systems (Engeström 2015, p. 70), and can drive learning and change as people attempt to resolve them (Cole and Engeström 1993; Engeström, Miettinen, and Punamäki 1999; Miettinen, Paavola, and Pohjola 2012; Miettinen and Virkkunen 2005, Yamagata-Lynch and Haudenschild 2009).

4.3.1 Application of Cultural Historical Activity Theory to Teaching Out-of-Field

To our knowledge CHAT has not been utilised in published research into teaching-out-of-field. Its potential in this area is suggested by the theoretical and structural considerations of the model described above which facilitate exploration of the complexities of out-of-field teaching, and the interconnections between the development of CHAT and concepts such as identity and boundary crossing, which have been applied in understanding the situation of teaching out-of-field (see below and elsewhere in this chapter). The application of CHAT in other educational research (reviewed by Roth and Lee 2007) is relevant to some of the important issues in teaching out-of-field identified in this volume. For example, Engeström and Office (1994) investigated the transition of beginning teachers to the teaching profession through exploring the contradictions they encountered, and their attempts to resolve them. Similarly, Saka, Southerland, and Brooks (2009) used CHAT to explore beginning teachers' transition into science teaching, identifying the importance of a supportive community of practice, and the personal and contextual influences on transitioning teachers' practices and goals. Using CHAT to explore beginning teachers' developing PCK was the subject of doctoral research by Diaz (2012), while Dubois and Luft (2014) used CHAT in their examination of professional growth in science teachers required to 'float' between different classrooms.

4.3.2 Cultural Historical Activity Theory Applied to Our Research

We have explored the utility of CHAT in framing the experiences of secondary teachers teaching out-of-field in Australia, focusing in this chapter on the out-of-field activity of Gary, a young early career teacher in a very small rural K-12 school. Gary's passion and area of expertise was agriculture but he was also tasked with teaching science. He subsequently upgraded his qualifications to formally qualify him to teach science but still felt to some extent out-of-field teaching in that area.

> I'm Agriculture through and through and I'm very comfortable in that area but with a lot of the sciences - I did that at uni to give myself another option - and I feel that's very, very foreign to me.

For the purposes of this chapter, we adopt the personal plane of sociocultural analysis (Rogoff 2008) to focus on the inner contradictions within the activity system of Gary's science teaching, shown in Fig. 4.3. Gary's activity in this system is directed towards a complex of objects. He is committed to doing a good job and to helping the students learn science, and he is also driven by the desire to 'give everybody a chance', which is a strong part of his identity: 'I'm passionate about, my one thing is to give everybody a chance. That's what I'm about'. In terms of tools, Gary considers that he has good rapport with students and good agriculture pedagogical content knowledge (PCK), but limited PCK in his out-of-field area of science. He has had to deploy new mediating tools such as a different syllabus and some different teaching strategies that he has sought from science-specific professional development. The rules enabling Gary's employment as a teacher of science prior to gaining relevant qualifications included the 'Willing to teach' category of relevant employment policies, and he was also operating within social expectations that teachers are qualified and competent to teach the subjects they are allocated. Gary is a member of the broader community of practice of teachers at the school, especially the four other teachers sharing the combined IT, agriculture, science and mathematics staffroom, with whom he discusses day-to-day issues of professional practice. Gary also has a close friend at another school who is a science teacher and with whom he discusses his science teaching. In the division of labour at the school Gary was one of two teachers allocated to secondary science classes. Using the CHAT framework as a lens to analyse Gary's interview transcripts illuminates several tensions associated with his out-of-field activity, as shown in Fig. 4.3.

Tensions (a) are evident between the multiple objects of Gary's out-of-field teaching. His specific object of helping students to learn science contradicts with his desire of 'giving everybody a chance', which he sees as less achievable through science than through his in-field area of agriculture:

> I always sort of focus more on the agriculture side of things, to give them an awareness and sort of just an appreciation and to develop some of those skills, that if they do step out into the Ag field they'd be more than capable and comfortable. Whereas my view for science, I see that I'm there to teach them what they need to know. All the same skills but … especially for junior [science], the skills I teach them now, I don't really feel will help them as much in future science life.

Tensions (b) are also created in Gary's science teaching activity because of the limitations in some of the tools he has at his disposal, such as PCK in science, conflict with his object of teaching science and doing a good job:

> I understand a lot of the concepts but trying to adapt and find ways to teach those concepts, I find quite difficult.

Tension (c) existed between expectations that teachers are qualified to teach their subject areas, and the division of labour that resulted in Gary being asked to teach science although not formally qualified. He resolved this tension by upgrading his qualifications:

> just to have that backing behind yourself and go, well in case something does blow up and they get a complaint or something - it'll never happen - but saying, "Oh well I've got my kid
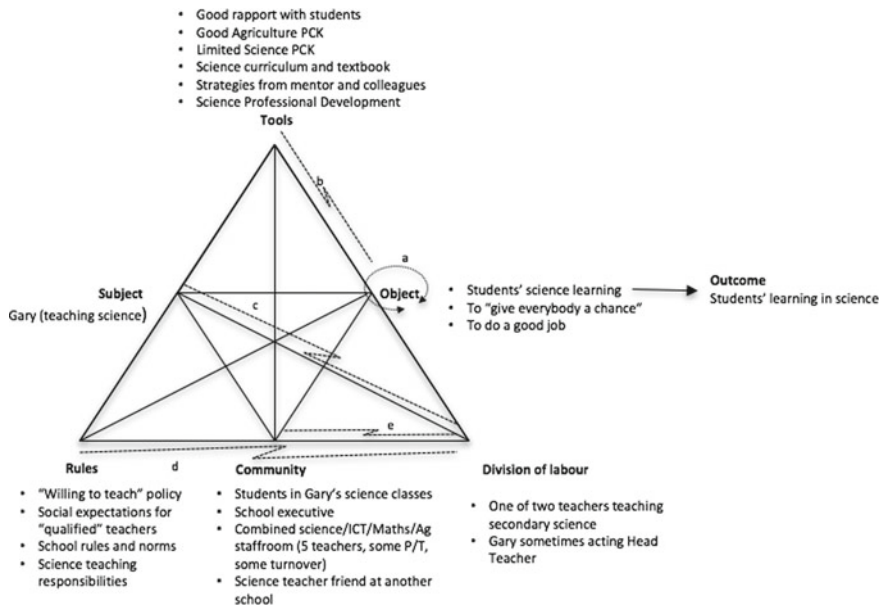
- Good rapport with students
- Good Agriculture PCK
- Limited Science PCK
- Science curriculum and textbook
- Strategies from mentor and colleagues
- Science Professional Development

Tools

Subject
Gary (teaching science)

Object

- Students' science learning
- To "give everybody a chance"
- To do a good job

Outcome
Students' learning in science

a

b

c

d

e

Rules

- "Willing to teach" policy
- Social expectations for "qualified" teachers
- School rules and norms
- Science teaching responsibilities

Community

- Students in Gary's science classes
- School executive
- Combined science/ICT/Maths/Ag staffroom (5 teachers, some P/T, some turnover)
- Science teacher friend at another school

Division of labour

- One of two teachers teaching secondary science
- Gary sometimes acting Head Teacher

Fig. 4.3 Activity system of Gary teaching science out-of-field

being taught being someone who's not qualified." And then I can say, "Well actually yes, yes I am….So I think just, having that behind me gives me a bit of a safety net.

Gary experienced considerable tension (d) because of the division of labour that allocated him to science classes, which contradicted with his passion and preference to be teaching agriculture, especially in his first 2 years:

because Ag really is my true love, and so I think that if I was to give away all of my Ag, then in actual fact, I'd say that I probably would not be a teacher.

This division of labour was also problematic (Tension e) given there was only one other science teacher position in the relevant community, which had been filled by a series of part-time or casual appointments. This meant that for some of the time Gary did not have ready access to a critical friend in science within the school community—a tension which he partially resolved by recourse to a close friend outside the school.

Teaching science was only one of Gary's activities at school, as he was also involved in the parallel activity system of teaching his in-field area of agriculture. This situation is not uncommon for out-of-field teachers or in schools more generally and, as argued by Engeström, Engeström and Kärkkäinen (1995, p. 319), people at work move between parallel activity contexts that require ' different, complementary but also conflicting cognitive tools, rules, and patterns of social interaction. The criteria of expert knowledge and skill are different in various contexts'. This was certainly the case across Gary's in field and out-of-field teaching activities, where

some of his knowledge and skill in agriculture was not relevant to the science teaching context. Moreover, the object of student learning in science was partially shared by the school executive and by the students, in a network of linked activity systems that brings further contradictions that can be explored from a third generation CHAT perspective, to further facilitate resolution of tensions and learning.

4.3.3 Critical Analysis of CHAT

CHAT has attracted criticism from scholars who are working within CHAT, or in related theoretical agendas, and those who object to the dilution of CHATs Marxist and dialectical legacy. Some of the grounds for criticism (reviewed by Engeström and Sannino 2010) include neglect of the cultural impact of digital technologies, disconnection to knowledge from practice, and its neglect of the individual subjective as opposed to collective activity. Roth (2009; 2012) points out that the triangle representation connotes stasis and emphasises the structure of activity, obscuring the dynamism of the inner contradictions, and agentic aspects of activity such as identity, emotion and other constructs. As acknowledged by the Center for Activity Theory and Developmental Work Research (n.d.), Activity Theory needs to develop conceptual tools to better understand dialogue, cultural diversity, multiple perspectives and voices, and networks of interacting activity systems.

One of the main affordances of CHAT in research into teaching out-of-field appears to be the power of the framework to integrate a range of other educational concepts commonly applied to research into teaching out-of-field. Roth and Lee (2007, p. 188), describe CHAT as 'an integrative road map for educational research and practice'. Three areas of integration are outlined below as examples.

First is the conceptualisation of mediational tools in CHAT to include teachers' PCK, teaching and learning models and other aspects of teacher professional knowledge often invoked in discussions of the out-of-field phenomenon. Integrating these important aspects of teaching out-of-field within a framework that conceptually and systematically links them to other elements of teaching out-of-field such as support from the *community*, and the *rules* and policies that surround the *division of labour* leading to teaching out-of-field can facilitate the analysis of the complexities and contradictions, and resolution of tensions involved in teaching out-of-field.

The second potentially useful aspect of integration afforded by CHAT relates to identity—one of the key ideas in research into teaching out-of-field as outlined earlier this chapter. Researchers in identity theory (Holland and Reeves 1994) argued that CHAT could be enhanced by the incorporation of the notion of the 'perspective' of subjects, while Penuel and Wertsch (1995) suggested that identity research should be conducted within local activity systems, taking into account the cultural and historical tools mediating the formation of participants' identities. Research by Roth and colleagues, in particular, has explored and utilised the nexus between identity and CHAT in educational contexts. Roth (2004, p. 6) argues that 'participation in activity entails change in life conditions and identity of the acting subject and its associated

object, and this change is coextensive with changing participation and learning'. He subsequently (2007, p. 83) theorises identity in relation to an expanded articulation of CHAT, in which engagement in actions is central to developing identity. Roth and Tobin (2004) use CHAT to frame an exploration of the changing identities of beginning science teacher, an experienced science teacher after moving to a new school and a student. In this account, he argues that:

> To understand identity, we must consider the tools, object, community, rules, and division of labor associated with the primary activity system. We also must consider other activity systems the individual is and has been involved in and take into account those activity systems (distributed over space and time) in which others from the primary activity system are involved. (Roth and Tobin 2004, p. 68).

The interplay between Gary's identity as a teacher of agriculture and committed professional, and elements of his out-of-field science teaching activity were apparent in our analysis. Gary's confidence and enjoyment teaching science increased markedly in subsequent years, partly because of interactions with the community associated with his science teaching activity, including some mentorship and passion sparked by a new Head Teacher. He was also impacted by the professional satisfaction of seeing his object being achieved: observing students appreciating and benefiting from his teaching. His identity shifted, and he came to see himself not as an agriculture teacher teaching science, but as an agriculture/science teacher. The third affordance of CHAT, as alluded to above, is in its relationship to the concepts of boundaries and boundary crossing, which are both explicit components of CHAT (Akkerman and Bakker 2011), and have informed the Boundaries Between Fields Model of Hobbs (2012, 2013a) in theorising and responding to the out-of-field phenomenon. More detailed discussion of boundary crossing is provided in the following section, but in CHAT, boundaries have been conceived of as contradictions between activity systems (Akkerman and Bakker 2011, p. 136; Roth and Lee 2007), which carry strong potential for learning. Gary brought with him tools such as tried and true pedagogical strategies from his agriculture teaching activity that have facilitated his crossing into the unfamiliar territory of science teaching. Third generation CHAT explores boundary crossings by multiple subjects and between multiple interacting activity systems (e.g. Engeström, Engeström, and Kärkkäinen 1995), enhancing coordination and communication in workplaces through resolution of contradictions between activity systems (Engeström 2001).

Finally, one of the strengths of CHAT resulting from these affordances is its potential in generating solutions to problems in practice. CHAT acts as a 'conceptual map' (Cole and Engeström 1993, p. 8) that can be used to trace and facilitate learning and change (expansion) by analysing the formation and resolution of contradictions (Engeström et al. 1999, p. 33; see e.g. Roth and Tobin 2004). Joint systematic analysis of problems in practice can help practitioners master the learning demands of workplaces (e.g. Engeström 1999), and this has been an explicit focus of much CHAT research activity (Center for Activity Theory and Developmental Work Research, n.d.). CHAT can potentially frame professional discussions among the school community around the complexities of out-of-field teaching, helping teachers to identify

and work towards resolution of contradictions and tensions as they learn to teach in their out-of-field areas.

4.4   Boundary Crossing[3]

Boundaries are the unit of analysis for a number of sociocultural theories used in educational research, in particular, communities of practice (Wenger 1998) and Activity Theory (Engström et al. 1995). The first focuses on the shared practices of individuals within communities and the learning required for a newcomer as they increase their participation within the community. The second focuses on complexities within systems, or fields, and interaction between different systems as people cross the boundaries between systems, as discussed above. Researchers interested in boundary spaces and practices often draw from these theories to inform their research (see Akkerman and Bakker 2011).

The boundary crossing lens is concerned with the learning that occurs as people move between different institutionalised and social practices. This theory shifts the focus from learning within a discipline or domain to the potential for learning 'when people interact with, move across or participate in different practices' (Akkerman and Bakker 2011, p. 1). Akkerman and Van Eijck (2013, p. 62) highlight that there has been a move towards exploring movements of people and practice across multiple social systems, that is, 'a movement from focusing on learning as a vertical process within a single social system, to learning as a horizontal process between multiple social systems'.

Akkerman and Bakker (2011) define boundaries as 'sociocultural differences leading to discontinuities in action and interaction' (p. 21), rather than any move between different practices. The emphasis here is on the resultant discontinuity that arises for the individual 'rather than sociocultural diversity per se' (p. 21). Such discontinuities can be overcome through a process of 'reestablishing action or interaction' (p. 5), leading to learning, and which ultimately leads to identity development (Akkerman and Bakker 2011). The utility of the boundary crossing lens lies in its focus on learning. Learning according to this theory ultimately means re-establishing practice despite differences in practices: 'boundary crossing should not be seen as a process of moving from initial diversity and multiplicity to homogeneity and unity but rather as a process of establishing continuity in a situation of sociocultural difference' (Kumpulainen and Sefton-Green 2014, p. 13). Boundaries reach a state of porosity, or permeability, when continuity is reached. Based on their review of 187 studies, Akkerman and Bakker (2011) described four learning mechanisms that arise at the boundary: *identification* of discontinuities; *coordination* of boundary objects; *reflection* on practice and identity; and *transformation* of practice and identity.

Boundaries can be crossed by people, objects and interactions. People can be boundary crossers, that is people who introduce practices from one field to another

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[3]Section 4.4 by Linda Hobbs.

such as pre-service teachers becoming in-service teachers (see for example, Goos 2015; Gunckel 2013), or people who move from one field to another and are expected to understand and assume the practices of the new field, such as out-of-field teachers (Hobbs 2013b). Objects can act as boundary objects, that is objects that inhabit and are recognised as coming from different cultural worlds, for example, objects or arte-facts that move between professional development sessions and teachers' classrooms (Kazemi and Hubbard 2008), or that can enable groups to negotiate a shared vision (Shimizu 2002). Interactions can be established between people who bring different practices together, for example, where there is sustained collaboration by people from different fields, such as interdisciplinary work (Akkerman and Bakker 2011), through interconnected communities of practice (Kislov 2013), where connected learning is promoted as students move between different contexts (Kumpulainen and Sefton-Green 2014), or exploring the implementation of computer-supported learning activities to link the language of school subjects with out of school practices (Lantz-Andersson et al. 2013a, b).

4.4.1 Boundary Crossing Lens Applied to Out-of-Field Research

The boundary crossing lens is particularly relevant for contexts where people are spe-cialised but may find themselves working in interdisciplinary teams or having to take on new roles within diversified work environments, such as having to teach new sub-jects. Interactions within these spaces can result in discontinuities for an individual, that is, recognising that a new practice does not match current or known practice. The boundary crossing lens provides a model for conceptualising the process of change, or the learning involved in moving across the boundary from one 'field' to another. Out-of-field teaching can be considered from the perspective of teachers moving from the familiar in-field subject where a background in the subject provides the knowledge, attitudes and appreciations that can inform their practice, to an out-of-field subject where there is limited background or experience to understand what and how to teach and represent the new subject. The language of boundary crossing, discontinuities, porosity or permeability of the boundaries, and the learning mech-anisms are useful for examining the learning associated with crossing boundaries between in-field and out-of-field teaching practices.

According to this theory, a boundary exists only when the differences between the practices and perspectives required to teach the subject are 'discontinuous', meaning that unless a teacher identifies differences in practices, they are unlikely to bene-fit from the learning that might occur as a result of crossing the boundary. While the 'field' of a teacher is determined by their qualifications, 'field-*ness*' is deter-mined by experience of these factors as discontinuities, that is, whether a teacher 'feels' out-of-field or not. Identification of these discontinuities can assist with iden-tifying where learning can take place (Hobbs 2013b), and therefore what support

is needed. According to Akkerman and Bakker (2011), and elucidated further by Hobbs (2013b), the boundary can lead to learning in a number of ways:

- Identifying discontinuities enables recognition of the differing practices in both fields and the issues that can arise as a result of being unfamiliar with the new practices. Learning arises when there is recognition and appreciation for the differing practices and identities that each involves. An out-of-field teacher might be prompted to identify the differences between the subject-specific demands of each subject.
- Coordination of boundary objects can assist in negotiating boundaries. Boundary objects are people (also called boundary spanners), artefacts or processes that have elements of both fields and so intersect both worlds, acting as bridges or anchors (Star 1989; Wenger 1998). They provide support while re-establishing practice. Learning involves coordinating or finding and applying these boundary objects to facilitate easy movement between sites. An out-of-field teacher might be prompted to find boundary objects, such as specific educational theories, support materials, or other teachers, to help them build confidence and competence in teaching the new subject.
- Reflection on practice and identity can be enhanced by encountering a boundary. When a teacher takes up an out-of-field subject, it offers the opportunity to encounter and negotiate differences in practice, and reconcile the unfamiliar with the familiar. Learning arises out of seeing things from a different perspective and 'coming to realise and explicate differences between practices and thus to learning something new about their own and others' practices' (Akkerman and Bakker 2011).
- Transformation of identity and practice occurs when confrontation from the intersection between social worlds leads to a reconsideration of practice and identity. Learning arises out of a recognised need for change. Professional identity expands by re-conceptualising: the task of teaching, relationships, their understanding of and respect for learners, and a belief in a capacity to adapt. Importation of practices across fields can be generative, for instance, for language teachers running discussion and debate in science, or economics teachers bringing context to mathematics.

Discontinuity may negatively impact on a teacher's efficiency in teaching or confidence to effect positive learning outcomes. Despite the obvious discontinuity relating to lack of content knowledge, there are many personal and contextual factors that disrupt the rhythm of a teacher when teaching out-of-field. Drawing on Akkerman and Bakker's (2011) theory, Hobbs (2013a) developed the Boundary Between Fields (BBF) Model (Fig. 4.4) to describe a number of factors that influence the identity construction for out-of-field mathematics and science teachers: 'the context of the teacher, support they received, or the personal resources of the teacher' (p. 285).

These factors can act as boundary objects, or they can exacerbate the effect of the boundary. For example, rurality can inhibit teachers' access to professional development that might help in the re-establishment of practice in the new subject. The BBF model can inform the learning mechanisms that support teachers' re-establishment
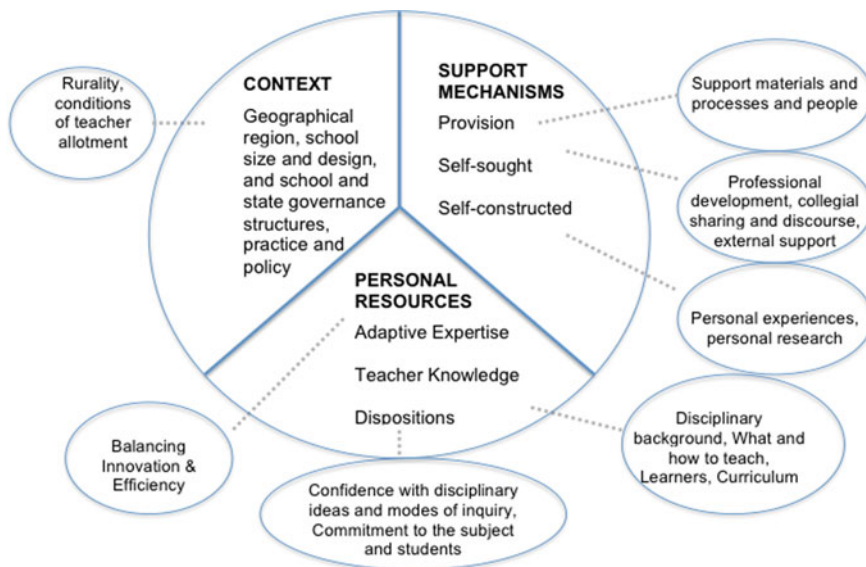
Fig. 4.4 Boundary Between Fields model (Hobbs 2013a)

of practice through helping them to identify where the discontinuity lies (personal resources and content), what boundary objects may be useful (personal resources and supports), where reflection can lead to reconsideration and transformation of practice and identity (personal resources).

4.4.2 Boundary Crossing Lens as Applied to Our Research into Learning to Teach Out-of-Field

To illustrate the analytical power of the boundary crossing lens, I refer to data for one teacher involved in a current study examining the learning and identity changes that occurs for out-of-field teachers, and the effect of context in shaping this. Eliza was a General Science, Physics and Information Technology (IT) teacher, who was asked to teach Year 8 Textiles. Eliza was interviewed individually (four times) and with her mentor or critical friend (twice) during her second and third year of teaching.

As a new teacher, Eliza had a strong relationship with the disciplines associated with her previous career as a mechanical engineer, and she found this translated well into her Physics teaching and some of the General Science units. She also had an IT background. Textiles was technically out-of-field except that she designed and sewed her own clothes, so had the necessary sewing and design skills needed to teach the subject.

In her first year of teaching Textiles, Eliza encountered difficulties in knowing how complicated to make the design challenges and underestimated the degree of support that students would need. Discontinuity caused from this was overcome by identifying what was common across her teaching. In her first year of teaching Textiles, she found that 'there's a lot of similarities between the practical work they do for textiles and practical work in either science or IT classes. Not the performing of it but the set up and how you manage a class and how you do that side of things'. Also, she mentioned that her 'passion for finding out and problem solving' was translatable across all of her subjects. In Eliza's reflections on her process of learning to teach Textiles, she felt that the design process helped her to make links with the science inquiry process in science and the technology systems design process in IT:

> when someone says in a whole lot of science classes, what happens when? Well, how can we find out? We could google it or we could…get out the things and investigate and when you investigate, really paying attention to what you can see and what's going wrong and how we can make it better. In textiles, it's more going, well what's our need?… something to keep you warm. What sort of materials are going to do that? What sort of design shape are we going to need to have? What sort of aspects is it going to have? Then you make it and it's pretty ugly. Well, how can we now make it aesthetically pleasing as well, how can we improve the fit… That is part of the design process… Same process but VCE IT is built around the problem solving methodology so the analysis, design, development, evaluation which is exactly the same, I've got a situation, here's my plan for what I'm going to do to solve it, here's the thing I have built…

In inviting her to take on the textiles teacher role, Eliza's principal encouraged her to use conductive thread as a way to bring science into the design process. In her first year she saw this as something for the future, but by her second year she had redesigned the students' tasks to include conductive thread, LEDs, and little button batteries as part of the design and construction. She was also working with the art teacher to

> start up a subject that is going to incorporate… modern or digital and analogue techniques, so, say, incorporating leatherwork and the new laser cutter… Coming from my textile stuff we'll be looking at things like felting, and some simple electronics…

By identifying the differences between practices, Eliza has questioned her assumptions about the nature of teaching a technology subject like Textiles, now realising that students need 'the spatial awareness and being able to work out how things fit together is… looking at how something 2D changes into 3D'. Re-establishing practice has involved identifying what was common, therefore bridging the gap between potentially distinct sets of pedagogical practices. This process was dialogical such that her practices in both subjects benefited, that is, were informed by and were informing of what it meant to be a STEM teacher. This required an expansion of her role and identity as a science/IT teacher. She was able to imagine and re-design curriculum in a way that integrated her science background into textiles tasks, but also through meaningful and innovative collaborations with another teacher to develop a new STEM unit.

The process of learning to teach out-of-field she likened to a 'dimmer light' used to make a light brighter or more dull:

it starts off, and it's a bit dark. Like you walk in and it's like, where the hell is everything…
You don't know what – you can sort of make out where things are, but over time it gets
brighter and clearer, and you can see exactly what you should be aiming for, or more exactly,
because someone still might move stuff around, but you know, and it just gets clearer. So,
from the start, you have an idea, it's just that it gets more identifiable as the light gets turned
up and you get more information.

For Eliza, continuity is a process of understanding how to best teach textiles,
and how to re-conceptulise curriculum and learning in ways that are congruent with
her passion for design, creativity and problem-solving. Drawing on Akkerman and
Bakker's (2011) learning mechanisms, evident in this example is learning enabled
by the following:

- recognising differences in practices differentiating the teaching and learning of
  textiles and science;
- finding what was common, in particular, the application of science objects (such
  as conductive thread) and the design process which then act as boundary objects,
  enabling her to establish continuity between the subjects;
- reflecting on her assumptions of the learning demands associated with sewing, and
  developing a new appreciation for the focus on skill-building in contexts that are
  meaningful for students; and
- transforming practice and identity as her identity expanded to incorporate a STEM-
  way of teaching.

Boundary crossing has enabled Eliza to be creative when working with materials
and be flexible with the design/ problem-solving processes, she has embraced new
roles and identities as STEM teacher and developed confidence in her ability to
work through difficult situations, and transformed textiles pedagogy and activities to
embrace twenty-first-century technologies. As she integrated science and textiles a
hybridised version of textiles was developed, inspired and informed by her physics
background, resulting in a boundary practice that extended her identity and enriched
her teaching career.

4.4.3 Critical Analysis of the Boundary Crossing Lens

The boundary crossing lens has currency when exploring out-of-field teaching as
it shifts the focus from what teachers are missing, to what they can bring to the
interaction and what can be learned; key to the theory is that learning is dialogical.
While out-of-field teaching has the potential to be devastating for teachers, rather
than assuming a deficit position, this lens recognises the possibilities for identity
expansion and a re-conceptualisation of practice if teachers are supported at their
point of need. This exploration of awareness and discontinuities associated with
boundary crossings has the potential to highlight the blackspots (problematic areas)
and blindspots (unknowns) in teacher education and in-school support mechanisms,

by informing curriculum and program structures in initial teacher education, or mentoring and initiation programs for new teachers. The theory also helps to understand why even experienced teachers can feel like novice teachers, or 're-noviced' (Blazar 2015), when teaching out-of-field (Hobbs 2013a) and therefore need additional time and support.

In preparing pre-service teachers to be adaptable, or in supporting out-of-field teachers through continuing professional development, the dialogical learning mechanisms of boundaries can be a useful learning framework to highlight differences in practices and how these differences can act as discontinuities, the types of boundary objects that can support re-establishment of practice, how reflection is needed to notice differences and learn something new, and recognise the need for change in practice and how they see themselves as pedagogues and subject specialists.

Two constraints may be associated with this theory when using it to understand the complexity of teaching out-of-field. First, while the boundary metaphor is useful for conceptualising specialists moving into new fields where the practices are different, the assumption that an out-of-field teacher has well-formed specialist practice of an in-field space may be tenuous when the out-of-field teacher has never actually taught in-field, as can be the case for novice teachers. Also, novice teachers face a number of boundaries that can blur the landscape and make learning more complex, i.e. boundaries between student and teacher, career changes, as well as in-field and out-of-field subject boundaries. For these teachers, a temporal idea of navigating through the landscape over time (like turning on a dimmer light) might be more representative of the learning processes involved.

Second, to some extent the boundary crossing lens glosses over power relations and conflicts that arise at, or that have caused the boundary. In criticism of communities of practice, Ramsten and Säljö (2012, p.34) state that

> the seductive metaphors of communities of practice with productive relationships between experts and newcomers engaged in shared practices serving a common good may gloss over an everyday world of conflicts, diverging interests and competition in and between communities and organisations.

Where the unit of analysis is on the out-of-field teacher, there is less focus on the effect of context in creating tensions between providing agency to teachers in perusing interests and teachers being placed without regard for interest, self-efficacy, or even capability. Shifting the focus to the practices within the fields within those contexts, rather simply on the teacher and their learning, may give due attention to problems that can occur within this boundary space. It also helps to shift the locus of responsibility for responding to out-of-field teaching away from just the teacher to include other key players involved, such as the school leaders and policymakers.

Despite these limitations, the boundary crossing lens is useful for articulating learning that arises because of the boundaries, and for supporting teachers to identify the boundary objects that might be useful and identifying the professional development needs of the teachers. 'Thinking about boundary crossing leads to questions about how and to what extend continuity is maintained despite sociocultural differences' (Akkerman and Bakker 2012, p. 156), that is 'finding productive ways of

relating intersecting dissimilar practices' (p. 155). The dialogical nature of boundary crossing recognises the ongoing, two-sided actions and interactions between practice (Säljö 2003) if indeed the context is supportive and enabling of change and innovation.

4.5   Epistemological Perspective: The Lived Experience Theoretical Framing[4]

The search to understand the meaning that this phenomenon has for teachers is directed through Gadamer's (1975) hermeneutic philosophy to 'understand the whole in terms of the detail and the detail in terms of the whole' (p. 258) and to explain the culture that underpins the out-of-field 'thing' (p. 414) as out-of-field teachers' truths. The hermeneutic circle explained by Gadamer (1975) encourages observation of the culture, beliefs and history surrounding out-of-field teaching practices in schools in its totality. It, however, underlines specific 'parts' of the whole experience to develop a clearer and deeper understanding of lived experiences. A hermeneutic mindfulness is attentive to the 'newness' that is offered through reflections on personal perceptions and understandings (Gadamer 1975, p. 238). Gadamer's theory (1975) directs the search for 'what' needs to be understood about the out-of-field experience while Van Manen (1977, 1990) guides understanding in terms of 'how' the phenomenon impacts teachers.

The Vygotskian theory (1978) of the knowledgeable other effectively aligns the impact teachers' content knowledge (CK), pedagogical content knowledge (PCK) and pedagogical knowledge (PK) play in prior and new concepts, described as the 'zone of proximal development' (ZPD). Reflecting on this theory will clarify 'why' there should be an urgency to understand the implications of the out-of-field phenomenon for quality education and quality teaching. A discussion of the phenomenological philosophy of Gadamer (1976) explains how different lenses and the use of specific verbal and non-verbal language supports researchers in looking deeper into the hermeneutic experiences, which greatly impact the teaching and learning space, in relation to out-of-field teaching. Gadamer's hermeneutic philosophy emphasises how language supports an understanding of the complex human 'life-world' (Regan 2012) and is fundamental in understanding the implications of the out-of-field phenomenon. Understanding depends on verbal and non-verbal communication; these linguistics reveal what there is to understand. Interpreting participants' 'language' about their lived experience makes this communication hermeneutical. Hermeneutics is a real-world philosophy that defends the view that truth is not reliant on scientific approaches for it to be discovered and that information is positioned in the history of the specific phenomenon.

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[4]Section 4.5 by Anna E. du Plessis.

4.5.1 Application of Lived Experience to the Out-of-Field Phenomenon

Epistemological investigations of the lived experiences that underpin the out-of-field phenomenon frame a deeper understanding of the phenomenon. This nature of knowledge about out-of-field teachers' lived experiences are closely linked to Vygotsky's socio-cultural learning theory and Gadamer's hermeneutic philosophy of deep understanding. Awareness of various theoretical assumptions and the need to developing a theory that supports in-depth investigations of lived experiences linked to the long tradition, culture and common practice of assigning teachers to out-of-field positions calls for bold innovative theoretical framing of this research. Critical analysis of the 'life-world' of people necessitates discretion, compassion and understanding. The need to have a theoretical frame that appreciates and acknowledges the impact of context-conscious understanding motivates a bold and innovative stance to create a theory that will provide support and access to a Context-Conscious Understanding Development theory (C-CUD theory) (Du Plessis 2018). This theory conceptualises deeper levels of understanding with strong alignment between contextual factors and epistemological awareness. The Context-Conscious Understanding Development theory (C-CUD theory) acknowledges the impact contextual factors have on lived experiences and is deeply embedded in Vygotsky's (1978) sociocultural learning theory, Gadamer's (1975, 1976) hermeneutic philosophy of deep understanding through linguistic expressions and Van Manen's (1977, 1990) lived experience and reflexivity theory. The C-CUD theory supports development of an in-depth understanding of 'real-life' experiences and the influence these experiences have on individuals who are expected to manage, use initiative and lead in the specific space they function.

The innovative theoretical framework, C-CUD theory (Du Plessis 2018) opens possibilities for focusing on the human experiences in order to unveil their truths within a specific context (Du Plessis 2018). Teachers in out-of-field positions have to manage their lived experiences that link to their feelings and experiences of incapacity to act with confidence as the knowledgeable other in the teaching and learning space. These lived experiences and what it means for the teaching and learning space have been, up to now, overlooked by educational and school leaders. The C-CUD theoretical approach is a suitable method to uncover the 'life-world' of teachers assigned to out-of-field positions (Du Plessis 2018).

This theoretical framework discloses misunderstandings and misconceptions about the implications out-of-field teaching practices have for quality education. The innovative theoretical framing aims to investigate the meaning of the out-of-field phenomenon at a deeper level while it underscores why it needs to be investigated and how we could construct a better understanding of the impact this multilayered phenomenon has on quality teaching and learning. Three powerful theories, the social-constructivist theory of Vygotsky (1978) to argue the complex learning and teaching environment that develops as a consequence of out-of-field teaching, and Gadamer's (1975, 1976) hermeneutic philosophy to support a deeper understanding

of Van Manen's (1990, 1977) complex lived experience theory, are linked to the out-of-field phenomenon. The multilayered complexities of the out-of-field phenomenon cannot be investigated in isolation as they are intertwined with contextual factors, epistemological experiences and expectations for quality teaching in classrooms. The theoretical framing provides an underpinning to search for the 'truth' in relation to out-of-field teaching practices and the 'lived meaning that out-of-field teaching has for the teaching and learning environment' (Du Plessis 2014, p. 15–16). Combining Vygotsky, Gadamer and Van Manen in a bold frame underlines the extreme care researchers need to take when investigating a phenomenon that involves sensitive lived experiences with implications for the environment in which individuals function. The C-CUD theoretical framing makes it possible to acknowledge the human experience while staying focused on the fundamentals and core issues that develop as a result of this specific phenomenon (Du Plessis 2018).

Participants need to explain how the nature of 'the thing', in this case the out-of-field phenomenon, and how it impacts the essence of life-world and understanding (Regan 2012). Gadamer's hermeneutic philosophy further claims that 'Someone who understands is always already drawn into an event through which meaning asserts itself' (Gadamer 1975, p. 446). The C-CUD theory adopted Gadamer's (1975, 1976) interpretation of understanding embedded in listening with a difference, observing, testing through different lenses, reflecting and searching from different positions to express meaning through the language offered by participants. This theoretical account of concerned understanding through language involves a 'fusion of horizons' (Gadamer 1976, p. xix), an ontological focus and a pre-understanding of the phenomenon under investigation (Vessey 2007).

Gadamer's view of 'being-in-the-world' with others stimulates the development of an in-depth understanding of out-of-field teachers' specific needs and how they experience collaboration (Brewer 2005). Ontological consideration, focusing on the life experiences within a participant's world, draws Gadamer's attention because of the 'capacity to not only interpret human understanding but misunderstanding as a mechanism for effective communication' (Regan 2012, p. 288). The philosophical belief in ontological understanding leads to the innovative and bold development of the Context-Conscious Understanding Development theory (C-CUD theory), a theoretical framework that emphasises discovery of meaning in context (Fig. 4.5).

'How' is the impact of the out-of-field issue linked to specific situations? Lave and Wenger

Critical reflection on specific context, experiences and situations is often absent. The connectedness to specific context as a fundamental theoretical stance allows for the exploration of a wide range of perspectives and interpretations in the field (Boudah 2011). Specific context in the search for out-of-field teachers' truths acknowledges the social interdependence of teachers and their students in classrooms while at the same time realising the impact that these teachers have on the actions of their students (Johnson and Johnson 2003).

The C-CUD theoretical approach supports an in-depth understanding of the situated influence of the out-of-field phenomenon and how it impacts teachers lived
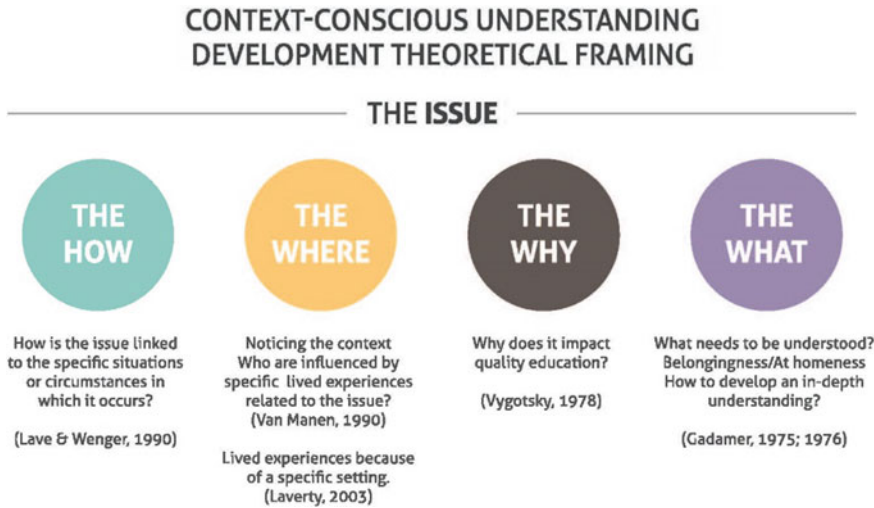
CONTEXT-CONSCIOUS UNDERSTANDING DEVELOPMENT THEORETICAL FRAMING

THE **ISSUE**

THE HOW

How is the issue linked to the specific situations or circumstances in which it occurs?

(Lave & Wenger, 1990)

THE WHERE

Noticing the context Who are influenced by specific lived experiences related to the issue? (Van Manen, 1990)

Lived experiences because of a specific setting. (Laverty, 2003)

THE WHY

Why does it impact quality education?

(Vygotsky, 1978)

THE WHAT

What needs to be understood? Belongingness/At homeness How to develop an in-depth understanding?

(Gadamer, 1975; 1976)

Fig. 4.5 An epistemological approach: C-CUD Theoretical framing to understand out-of-field teaching experiences (Du Plessis 2018)

meaning of being a teacher. The issue of out-of-field teaching practices is not isolated from the specific situation or circumstances in which it occurs. A clear understanding of the link between the out-of-field phenomenon and its situatedness will improve the effective management of the phenomenon through targeted support. Analysis of the phenomenon and its embeddedness in teachers' specific situations and context offers a theoretical framing for deeper understanding of these teachers' life-world, unique situations, contexts, and needs teachers themselves might not be conscious of or notice (Van Manen 1990; Laverty 2003; Lave and Wenger 1990, 1991). Noteworthy, an in-depth reflection on teachers' specific contexts, experiences and situations is often absent when decisions are made about teachers' placements, support or teacher performance assessment processes.

'Where' do the implications of the out-of-field phenomenon impact teachers and therefore effective teaching? Van Manen

A hermeneutic philosophy aims 'to let things speak for themselves' through a descriptive approach and accepts that 'lived experiences are always already meaningfully experienced' when they are interpreted (Van Manen 1990, p. 180–181). The C-CUD theoretical approach sought to understand the lived meaning of 'being part of the out-of-field situation' in such depth that it reveals what participants themselves might not be aware of (Van Manen 1990; Laverty 2003). The themes that emerged through a C-CUD theoretical framed investigation form 'insightful invention, discovery and disclosure' while supporting the construction of new meaning (Van Manen 1990, p. 88). Identification of recurring themes unwraps the 'needfulness and desire' (p. 88) within the teaching and learning context to make sense of lived experiences in relation to out-of-field teaching practices. The specific theoretical framework supports

in-depth conversations through which information emerges about the 'life-world' of out-of-field teachers 'as we immediately experience it pre-reflectively' (Van Manen 1990, p. 9).

'Why' is Understanding Important? Vygotsky

Conceptualising the theoretical framework to address question about 'why' it is necessary to develop a deeper understanding support the construction of knowledge in relation to the out-of-field phenomenon. Focus on Vygotsky's (1978) theories about the more knowledgeable other (MKO) and the zone of proximal development (ZPD) accentuates the impact of CK, PCK and PK as well as the impact its absence has on the teaching and learning environment. Vygotsky's social-cultural constructivist theory provides an instrument that facilitates an in-depth understanding of why out-of-field experiences impact the teaching and learning environment.

The significance of confident social interaction in the teaching and learning space is underlined in the C-CUD theoretical framing (Du Plessis 2018). The implications of experiences within the learning and teaching community for the development of students and how effectively they construct meaning (Vygotsky 1978) should not be underestimated. The culture within the learning environment effects cognitive progress (Vygotsky 1978). The sociocultural interface of students with a knowledgeable other guides and grows healthy learning dispositions and habits (Vygotsky 1978). Vygotsky's theory underlines the impact of expertise in guiding the construction of new knowledge while accentuating the scaffolding of prior and new knowledge. The 'why' in understanding the phenomenon involves acknowledgement of the place that expertise has in ensuring that students internalise new, unfamiliar knowledge and what happens in the teaching and learning environment when the teacher is not the knowledgeable other. The language of what happens in the classroom impacts internalisation of new knowledge. The culture, atmosphere, traditions and beliefs practiced in classrooms influences the smooth transitions between prior acquired knowledge and newly constructed knowledge to internalise new concepts.

'What' is there to Understand? Gadamer

Hermeneutic phenomenology as a philosophy evolved from the theories of Husserl (Zahavi 2003) on the essence of consciousness and Heidegger's (1962) theories which involve the ontological principle. Haring (1962) defined ontological principles as a focus on 'actual entities' (p. 4). The philosophical beliefs for the development of the C-CUD theory are to open the field for an in-depth connection with the participants in their 'real life-world', in their context and in the 'space' where their lived experiences take place (Du Plessis 2018), based on Gadamer's hermeneutics (1976). The C-CUD theory frames an investigation as ontological, making use of close conversations and continuous interaction, formal and informal, with participants to develop a fuller understanding as 'in linguistic communication, the world is disclosed' (Gadamer 1975, p. 404). Husserl's notion of the 'life-world' defines object and subject as interconnected through the subject's lived experience, while Heidegger (1962) explained that 'the being-there' (p. 182) of Dasein (the truth) is 'being in the world' (p. 174). The argument then focuses on how being assigned to out-of-field teaching practices

impact teachers' sense of belongingness, not only in these specific fields but also in the teaching profession.

Out-of-field teachers influence the life-world of the people they encounter—parents, students, colleagues and the wider community—but, in turn, are influenced by the 'world' in which they live (Schutz and Luckmann 1973). Bourdieu (1979) records that habitus encompasses embodied dispositions that define how an individual perceives their world, performs in this space and adjusts to it according to specific challenges. The C-CUD theoretical framing underlines the influence of embodied experiences and specific context on dispositions within the teaching and learning environment. Sharing their understanding during interviews, participants reflect on the relationship between 'being' and 'their truth' in terms of their out-of-field context. Bourdieu (1990) emphasised how meaning-making and 'habitus' influence social viewpoints. Out-of-field teachers' experiences of 'belongingness' (Gadamer 1975, p. 416) to the specific context in which they function informs a better understanding of the phenomenon.

The embodied knowing that binds the experience and the person in union (Dall'Alba and Barnacle 2005) has relevant meaning for investigating a multilayered phenomenon such as the out-of-field situation. Targeted dialogue develops and mediates understanding through stimulating interest to conceptualise 'taken for granted' experiences of everyday life (Barnacle 2001) and what underpins these 'taken-for-granted' dispositions. In agreement with Gadamer's (1975) philosophy, respondents are perceived as a part of a larger community, culture, history and context. Respondents do not function in isolation. Gadamer constructed his notion of the individual, drawn from Heidegger's view, as always being a person-in-community with a past or tradition. He further suggested that analysis of the human experience should take this into consideration: 'There are no eternal truths. Truth is the revealedness of being that is given with the historical nature of there-being' (p. 479). The development of the C-CUD theoretical frame is deeply embedded in a Gadamerian notion that practical wisdom involves self-understanding within the situation of practice while the distance from the practice 'can induce a distortion' (Grondin's 2002, p. 5). Gadamer further defines practical wisdom as the understanding that develops through the fusion of different horizons (Gadamer 1975). Vested in Husserl's theories (Zahavi 2003) of the 'horizon' of experiences that hovers between what is real or concrete and what is seen as the ideal or the abstract ideas of people, the C-CUD theoretical framework finds validity in Gadamer's theory of 'the fusion of horizons' (Gadamer 1975, 1976, p. xix). His 'fusion of horizons' theory (1975) claimed 'to interpret means precisely to use one's own preconceptions so that the meaning of the text can really be made to speak for us' (p. 358).

The 'fusion of horizons' philosophy uncovers the voice and agency of different participants to offer a deep understanding of 'being' (Gadamer 1975, p. 432). The mediation of understanding is interwoven with specific circumstances and 'the self' (Gadamer 1976). Gadamer's (1975) hermeneutic approach is a cognizant fusion of the position of the interpreter and the data being inferred.

4.5.2   Lived Experience Theory Applied to Our Research on the Out-of-Field Phenomenon

The C-CUD theoretical framework offers explanation, understanding and several acts of clarification ('fusion of horizons') as described by Gadamer (1975). The interpretation of the verbal and non-verbal interaction and communication reveals rich clusters of meaning identified from data to expose the essential nature of the lived experience (Van Manen 1990). A beginning teacher shared how the specific situation, circumstances and context in which she finds herself assigned to teach a subject outside her field of qualification and expertise impacted her lived experience as a teacher as well as her self-esteem beyond the classroom walls:

> I am a disaster, I am pathetic, I sit behind my desk the whole day, I have no friends and no time for my family. I feel worthless in everything I do.

An in-depth understanding of the lived experiences teachers in out-of-field teaching positions have to manage only develops through appreciation of the context in which the out-of-field phenomenon occurs (Du Plessis 2018).

4.5.3   Critical Analysis of Lived Experience

A context-conscious understanding of data depends on a trust relationship between the interpreter and the interpreted, displaying awareness of preconceptions within a specific historical time and context in order to expose beliefs and build new knowledge about the meanings of specific actions (Maggs-Rapport 2001). Awareness of tradition and historical time advances an in-depth understanding of the meaning of diverse contexts and validates the data gathered.

Gadamer's hermeneutic circle, where the whole can be clarified by smaller, specific incidences against the background of cultural, historical and literary context, supports looking beyond common practices and taken-for-granted attitudes. Interpretive and reflexive analysis acknowledges that personal context conditions have implications for the research approach. Gadamer (1975, p. 238) described interpretive analysis, in agreement with Heidegger (1999) as 'A hermeneutical trained mind must be, from the start, sensitive to the text's quality of newness—sensitivity involves neither neutrality—nor the extinction of one's self but the conscious assimilation of one's own fore-meanings and prejudices'. The analysis process includes investigating and re-examining accounts to find discernments through analysis of the participants' accounts, while the context of the participants' story is the emphasis of the hermeneutic circle (Annells 2006; Crist and Tanner 2003).

Focusing on the whole and respecting the parts (Gadamer 1975) underpins the value of Vygotsky's (1978) social constructivist theory for understanding the meaning that the out-of-field phenomenon has for classroom context. The theoretical framing allows for a holistic view of the out-of-field experience while affording

researchers opportunities to 'get close' to valuable data in the field (Berg 2004; Cohen et al. 2011; Ladson-Billings and Donnor 2005). The theoretical framing stimulates a view of the phenomenon as 'the thing' to be understood through different participants. The conceptual framework imparts new understanding about the interrelation between out-of-field experiences and effectiveness in classrooms and schools in contextual factors.

4.6 Synthesis and Key Insights

The four theories and what they can illuminate about the out-of-field teacher are summarised in Table 4.3. Positioning theory, Activity Theory and Boundary Crossing are distinguishable, although there is common ancestry of Activity Theory and Boundary Crossing meaning that there is agreeance in the underlying theorization of boundaries between social practices and the learning that such boundaries can prompt. For fourth theory, the three contributing theories—Vygotsky, Gadamer and van Manen—are expanded on to illustrate what each can contribute to an analysis of teaching out-of-field and what each contributes to the C-CUD Theory proposed by du Plessis (2018).

So what can be gained from this juxtaposition of theory? There are two parts to this question: first, what can be learned about theory; and secondly, what can be learned about the phenomenon of teaching out-of-field?

In response to the first question, the four lenses showcased here have been shown to foreground different aspects of the phenomenon, thus highlighting the value of drawing on multiple theories, either across studies or within a study. The third and fourth lenses illustrate also how new theory or models can be derived from or at least informed by existing theory in ways that more keenly focus researcher attention on the research problem. The C-CUD theory from du Plessis, in particular, is rigorously informed by multiple theories, illustrating also the explanatory power gained from taking a kaleidoscopic approach to research. Denzin and Lincoln (1999) proposed the notion of interpretive researcher as bricoluer, giving permission for researchers to draw on whichever theoretical frameworks or research methods are needed to solve the researcher question and gain insight into the problem. Indeed, the work of du Plessis might be seen from this perspective as experiences are interpreted both from the individual teacher perspective while also recognising the social nature of learning as teachers interact within the social setting of the classroom and school. There is also great benefit in using a single theoretical lens to interrogate closely some aspects, for example, positioning theory enables close analysis of the ways the respondent articulates, shares, and puts into narrative their experiences, and can highlight through this articulation that what ways in which teachers might feel marginalised by having to teach something new but also the agency they feel they have over their allocation, learning and teaching. Activity theory has particular power in providing a framework for identifying various parts of the systems within which the teachers operate and can be valuable in highlighting disjunctures, discontinuities and challenges that teachers

Table 4.3 Summary of theories and their application to researching teachers who teach out-of-field

Theory:	Positioning theory	Activity theory (third generation)	Boundary crossing	Sociocultural learning theory	Philosophical hermeneutics	Lived experience
Key theorists:	Harré and van Langenhove (1999)	Engeström (1990, 1998, 2015)	Akkerman and Bakker (2011)	Vygotsky (1978)	Gadamer (1975, 1976)	Van Manen (1977, 1990)
Focus of theory:	Reality is conceived of as dynamic, changing moment-to-moment in conversational acts. Positioning triad describes an individual's perceptions and interpretations (Storylines) of the social, cultural and historical facets of the moral order (Discursive practices), and the system of rights and duties within which intentional acts are done (Positions)	Collective human behaviour is object-oriented and involves dialectical relationship between a subject, object, culturally mediated artefacts, patterns of division of labour and the wider community	Learning occurs as people cross boundaries between different social practices. Discontinuities can be overcome by re-establishing continuity and increasing the porosity of the boundary	The impact of expertise from more knowledge able others, through the zone of proximal development, in guiding the construction of new knowledge while accentuating the scaffolding of prior and new knowledge	Practical wisdom is understanding that develops through the fusion of different horizons: horizon of experiences between what is real or concrete and what is considered the ideal or abstract. Uncovers the voice and agency of different participants to offer a deep understanding of 'Being'	Lived experiences are always already meaningfully experienced as they are interpreted

Table 4.3 (continued)

Theory:	Positioning theory	Activity theory (third generation)	Boundary crossing	Sociocultural learning theory	Philosophical hermeneutics	Lived experience
Applicability to out-of-field						
Usefulness:	Focuses on identity formation, socialisation practices, habitus and capacities. Provides alternative to static concept of 'role' Understand and track changes in teacher identity formation and perceptions of personal agency as they negotiate unfamiliar curricular contexts	Focuses on how activity systems are interlinked, interact with and influenced by other related systems. Shared objects are the unit of analysis Contradictions and tensions can be sources of conflict but can also drive learning and change	Focuses on what teachers bring to the boundary rather than what teachers are missing Learning mechanisms of the boundary allow teachers to move from in-field to out-of-field spaces	Focuses on the complexity of the learning and teaching context Expertise of the teacher ensures that they are the more knowledgeable other. The culture, atmosphere, traditions and beliefs brought to classrooms influence student learning	Focuses on what needs to be understood—culture, beliefs, history. Analysis focuses on how the teacher's experience of belonging to a specific context informs a better understanding of what is means to be an out-of-field teacher	Focuses on the meaning of experience and the impact on the individual. Anecdotal narratives constructed from in-depth conversations give insight in toe life-worlds of out-of-field teachers

(continued)

Table 4.3 (continued)

Theory:	Positioning theory	Activity theory (third generation)	Boundary crossing	Sociocultural learning theory	Philosophical hermeneutics	Lived experience
Limitations:	Linguistic uncertainties as described by Herbel-Eisenmann et al. (2015) may cause misunderstandings of the seminal terms used to better understand the complexity of social situations	Nexus between CHAT and identity not immediately apparent. This link was extended by Roth (2004)	Assumes knowledge and practice of in-field area well understood May gloss over power relations that arise at or cause the boundary crossing	The uniqueness of the individual can be overlooked while the socio-cultural aspects can be over emphasised	Articulation of perceptions, thoughts and feelings requires deep and challenging reflection and consciousness of a specific phenomenon	A focus on the individual meaning of an experience may misrepresent or only partially describe the broader situation or context
Emergent theories/advances:	Fine-grained analysis of interpersonal encounters may inform models of professional development to build the capacities of out-of-field teachers		Boundary Between Fields Model (Hobbs 2013a) identifies the factors that make a teacher 'feel' out-of-field	Context-Conscious Understanding Development Theory (du Plessis 2018) Draws together these theorists as a framework for developing an in-depth understanding of the situated influence of the out-of-field phenomenon and how it impacts the teacher's lived meaning of being a teacher		

can face, thus informing where support might be provided. Similarly, the boundary crossing lens has this effect of identifying discontinuities, but also the boundary crossing construct is useful as a metaphor of the movement of teachers across specialisations or subject boundaries. Also, the learning mechanisms can provide a useful language for shifting discussion from a deficit view of teaching out-of-field to highlighting the potential for learning and what is needed to support learning, identity expansion and transformed practice.

In response to the second question, and summarising the arguments from each theory in preceding sections, we can see that teachers' work is comprised of multiple systems and that moving between these systems, that is crossing boundaries, can result in discontinuities, which relates to their 'at home-ness', and which can in turn lead to learning if the conditions are right. Common ground, or boundary objects can assist within this crossing so that with experience and overtime there is permeability across sites as teachers learn what is needed to operate successfully in the new subject. Teachers experience these boundary crossings in different ways, and their degree of at-homeness influences the meaning that teachers attach to these experiences. This meaning is a product of, or at least contributed to or shaped by, the teacher's personal qualities (such as disposition to learning) but also and perhaps more significantly by the nature of the context they are in. Crossing the boundary between subjects, therefore, can provide opportunities for learning as long as the personal and contextual factors afford, support and embrace teaching out-of-field as a complex, potentially destabilising, potentially enriching processes that take time, space and understanding to overcome. Teachers may position themselves in relation to the tasks as pedagogues and subject specialists, the associated rights and duties, which can morph and take shape contextually and temporally, and issues of power and agency arise in relation to the control they perceived they have in their allocation and as they attend to their professional duties negotiating new content and pedagogies.

4.7   Conclusion and Implications for Practice and Policy

This chapter has showcased four theoretical lenses that have been used to analyse the phenomenon of teaching out-of-field. As a complex phenomenon, we have shown that even when focusing specifically on the teacher as the unit of analysis, different theoretical lenses are needed to highlight different aspects of this experience and its effects. We acknowledge that other lenses might just as well have been showcased here, such as identity theory, which is becoming a well-used and appropriate lens for examining the effects of out-of-field on the teacher (see for example, Bosse and Torner 2015). Even more so, when the focus of analysis moves beyond the teacher, other theoretical lenses can be fruitful in highlighting, for example, how different stakeholder groups represent out-of-field teaching as might be shown by the use of 'problem representations' (Bacchi 1999); such 'representations' (such as how out-

of-field teaching is represented) are created and shaped as we speak about them and as we propose how to 'address' them.

Theory enables the researcher to find and tell the story they want to tell. Therefore, researchers need to be thoughtful when selecting theory so as not to twist the story to unfairly paint a deficit position of what it means to, and the effects of, teaching out-of-field. After all, appointing teachers to teach subjects for which they have no specialisation is often a remedy to a lack of appropriately specialised teachers, often a last resort, and often an accepted response within education systems that are often under-resourced. Public understanding of and trust in the teaching profession can be seriously undermined when only the negative story is told. Similarly, only focusing on positive experiences of professional learning and identity expansion can downplay the power dynamics that can be pivotal in determining the quality of the experience of teacher learning and feelings of survival and failures that can sometimes be experienced by teachers. An over-emphasis on the individual can neglect the influence of context, while over-emphasising the sociocultural context may not account for the range of experiences of individual teachers within and across different contexts and education systems. Research into this phenomenon that is informed by theory should be honest in how the theory provides a constructive constraint to the examination of the phenomenon, that is, which aspects of the phenomenon fall within its gaze at the exclusion of others. What a researcher hopes to achieve through the research should also be clearly indicated as the theory one uses will bring to the fore different aspects of the phenomenon that have different implications for policy and practice.

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