Chapter 9
Understanding Learning for Work: Contributions from Discourse and Interaction Analysis

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Abstract In recent years, interaction and discourse analytic methods have been applied extensively in various areas of educational research and have become an important theoretical perspective for those concerned with the study of learning in social settings. Following this innovative perspective, this chapter advances two main arguments. First, it stresses the idea that adopting a discursive and interactional approach on professional practice can contribute to the body of concepts and methods applied for understanding practice-based learning. And second, it considers that there exists a strong epistemological continuity between social theories of learning on the one hand, and research methods belonging to the field of discourse and interaction analysis on the second hand. From there, the aim of the chapter is to identify and specify an interdisciplinary field intersecting linguistics methods and professional education research. It is also to show what these methods consist of, how they may be enacted and applied and what are their potentialities and practical implications for researching the field of professional and practice-based learning.

Keywords Discourse • Interaction • Language • Knowledge • Identity • Context • Multimodality

In recent years, interaction and discourse analytic methods have been applied extensively in various areas of educational research and have become an important theoretical perspective for those concerned with the study of learning in social settings. Initially conceived as descriptive tools elaborated by linguists for describing the complex organisation of language use in context, these methods have progressively been seen as powerful resources to gain a fine-grained understanding

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of teaching and learning processes in a wide range of formal and informal educational contexts. By studying discourse and interaction within classrooms and other educational settings, researchers have provided new insights into the dynamic relationships among language use, social practice, and learning. More specifically, they have provided understandings of the ways in which learning opportunities are constructed across time, groups, social institutions and joint actions.

Following this innovative perspective, this chapter advances two main arguments. First, it stresses the idea that adopting a discursive and interactional approach on professional practice can contribute to the body of concepts and methods applied for understanding practice-based learning. And second, it considers that there exists a strong epistemological continuity between social theories of learning on the one hand, and research methods belonging to the field of discourse and interaction analysis on the second hand. From there, the aim of the chapter is to identify and specify an interdisciplinary field intersecting linguistics methods and professional education research. It is also to show what these methods consist of, how they may be enacted and applied and what are their potentialities and practical implications for researching the field of professional and practice-based learning.

To address these issues, the chapter is divided in five main sections. The first section retraces the origins of a so-called workplace discourse research field. It reflects on the growing importance of discourse and interaction within contemporary workplaces and emphasises the role of language in social theories of learning, as they have been extensively disseminated within vocational and professional education research. These bring empirical as well as theoretical arguments for an interdisciplinary examination of discourse-mediated practices through which workers encounter learning experiences at work. The second section is designed to provide the reader with a synthetic understanding of discourse and interaction analysis. Key concepts and principles underlying this multidisciplinary field are exposed and the main requirements underlying methodological aspects are briefly summarised. The third section illustrates how the study of discourse and interaction may contribute to the understanding of professional and practice-based learning. It identifies a range of research topics that have been investigated from an interactional and discursive perspective and reports on recent research conducted internationally on these topics. Section 9.4 provides further illustration of how discourse analytic methods may be enacted to inform practice-based learning research. Referring to empirical data recently collected in the context of the Swiss vocational education and training system, the chapter observes how guidance is interactionally accomplished in discourse and how apprentices and supervisors use a variety of semiotic resources to shape learning opportunities in work production activities. To conclude, the fifth section discusses the potentialities and challenges associated with a discursive methodology and stresses its practical applications and implications for vocational and professional education.

9.1   The Emergence of Workplace Discourse Research

In the past two decades, a growing number of scholars with an expertise in various areas of linguistics have become interested in analysing and interpreting empirical data collected in professional settings. Depending on their theoretical backgrounds and origins, research topics conducted in this area have endorsed multiple labels, including for instance *institutional talk* (Drew and Heritage 1992), *professional discourse* (Candlin 2002), *workplace studies* (Heath, Knoblauch and Luff 2000), *organisational discourse* (Boden 1994), *language in the workplace* (Boutet 2008; Holmes and Stubbe 2003), *business discourse* (Bargiela-Chiappini 2009) or *workplace discourse* (Koester 2010). This body of research does not constitute a coherent and well-integrated research field, but it assumes that a fine-grained analysis of how workers make use of language, both in its oral and written forms, may contribute to better understand professional practice and the conditions in which it unfolds. Reciprocally to this "professional turn" in applied linguistics, it is also noteworthy that researchers in adult and vocational education often stress the role of language in professional learning and development and therefore refer to concepts related to linguistic theories.

Elaborating on the idea that there is a growing interest for an interdisciplinary research domain intersecting linguistics and professional education research, this section investigates why it is relevant and productive to care about discourse and interaction when investigating professional and practice-based learning. In the following paragraphs, empirical as well as theoretical arguments are brought for a multidisciplinary cross-examination of learning for work. We stress the importance of discourse and interaction processes in workplace practices and argue for epistemological continuities between social theories of learning and the study of language in action.

9.1.1   The Linguistic Demands of the Contemporary Workplace

There are strong empirical reasons why researchers concerned with the study of learning in and for professional practice should be concerned about the role and place of discourse and interaction in the workplace. As numerous sociolinguists have noted (Boutet 2008; Heller 2003), the historical evolution of work itself has established increased demands regarding language use and communication skills. In their everyday professional practice, workers are expected to share information, to solve problems, to cooperate with colleagues, to plan future actions or report on past experiences. This is particularly true in the context of what is often referred to as the "new work order" (Gee et al. 1996), an economy that is strongly dominated by the service sector, by information and communication technologies, by a dematerialization of production and by globalized management strategies. In many respects, the contemporary workplace sees language use not only as a peripheral

ingredient but as a central component through which professional practice occurs. In a sense, this has always been true for professional sectors such as education, health, law or social work. But these linguistic demands are also becoming increasingly significant in other domains from which they where historically perceived as absent or peripheral, such as the industrial sector for instance. It is now commonly expected from all workers that they should be able to cooperate with colleagues, have sufficient literacy and numeracy skills, adapt to norms and procedure that may take written or oral forms, and be capable of reflexive thinking. In other terms, discourse and inter-action processes have become progressively perceived as productive resources and not anymore as a mere distraction.

In recognising the configuring role of discourse and interaction in contemporary workplaces, sociolinguists have also highlighted the multiple functions endorsed by linguistic resources in workplace contexts. These functions include practical, social as well as cognitive dimensions of professional practice (Lacoste 2001). First, language use at work has often been reported as serving practical functions. It is by engaging in discourse and interaction that workers "get things done", that they plan and anticipate future actions, perform them, and provide accounts and evaluations about past events. Second, linguistic resources are also used by workers as resources for accomplishing the social dimensions of professional practices. They are means through which workers position themselves in groups, endorse specific identities, produce or reproduce cultural communities or establish power relations. And finally, linguistic resources as they are used in workplace discourse and interaction also serve cognitive processes related to memory, problem solving and learning. It is by engaging in discourse and interaction that workers share and negotiate a joint understanding of the world, that they take decisions, reflect on their experiences and that they may learn from more experienced workers.

Acknowledging the centrality and multifunctional nature of language use in professional practice has significant implications for vocational and professional education. These implications include reinforced expectations in terms of training and a renewed understanding of the skills and competences workers must share for facing the demands of the contemporary workplace. It is indeed of primary importance to prepare and adapt the workforce to the multilingual, globalized and discourse-mediated professional practices dominating the "new work order". And it is also important to provide workers with resources that may assist them in facing these specific demands. At a more theoretical level, these evolutions also shed new light on the ways language and communication skills may be perceived in vocational and professional education. In the contemporary context referred to, these skills are not to be seen as "soft" or related to a general cultural background; rather, they have to be considered as key instruments for professional practice and as integral components of professional competences. Finally, it should also be noted that the "linguistic turn" mentioned here leads to a reconceptualisation of the relations linking language and education. Language, in such a perspective, is not only a matter of teaching and learning or a cultural tool that has to be acquired; it is also a means through which workers experience learning at work and therefore an important condition for learning through practice. This is what the next section proposes to develop.

9.1.2   The Linguistic Aspects of Learning Processes

Social theories of learning have recurrently underlined the collective and distributed nature of learning processes and the configuring role of "the others" and language in the ways individuals access and interiorise knowledge and develop skills. The Vygotskian concept of the zone of proximal development (ZPD) defined as "the distance between the actual development level as determined by independent problem solving and the level of potential development as determined through problem solving under adult *guidance* or in collaboration with more able peers" (Vygotsky 1978, p. 85) is often regarded as a central reference point for approaches that see learning processes as involving a plurality of individuals. From the Vygotskian perspective, it is assumed that psychological development does not consist of a process of individual and biological maturation but involves close interactions with the cultural environment and with more experienced individuals. Guidance and verbal interaction, in this framework, appear as important conditions for expanding the zone of proximal development and for developing problem-solving skills. Vygotsky also argued that the acquisition and use of language transforms children's thinking. He proposed to see language as a "cultural tool" having a profound effect on both collective and individual thinking. One of the distinctive strengths of his theoretical model is that it "explains not only how individuals learn from interaction with others, but also how collective understanding is created from interactions amongst individuals" (Mercer and Howe 2012, p. 13).

Closely aligned to Vygotsky's theory of psychological development, Bruners' concept of "scaffolding" has often been used in sociocultural psychology to refer to discourse processes through which individuals are guided in their learning. Initially developed in the context of dyadic interactions between parents and young children (Bruner 1983; Wood et al. 1976), the concept of scaffolding is defined as a discourse mediated teaching and learning process, wherein the adult helps the child progress from assisted performance to unassisted once. Based on this seminal work, numerous scholars have attempted to transpose the concept of scaffolding into the context of school interactions (Panselinas and Komis 2009; Rojas-Drummond and Mercer 2003) in order to investigate the educative value of various sorts of dialogues (i.e. teacher-led dialogues; peer group discussions). From this standpoint, questioning practices initiated by teachers have been seen as powerful communicative means by which students are guided to elaborate their own thinking.

By transferring the concepts of guidance, scaffolding and the zone of proximal development beyond the limits of the classroom, contemporary approaches to professional learning have promoted new ways of understanding the relations between learning and work. In this respect, convincing alternatives to the distinction between formal and informal education have been advanced (Evans et al. 2006; Guile and Young 1998). In Lave and Wenger's anthropological approach to apprenticeship for instance (Lave and Wenger 1991; Wenger 1998), participation in communities of practice is seen as an important means by which newcomers gain access to knowledge and develop practical skills in specific production contexts. Learning is not exclusively about the acquisition of expertise and practical intelligence, but also comprises a process of

identity transformation. That is, under specific conditions, including participation to communicative events, newcomers are progressively recognised as members of communities of practice as they move from peripheral to full participation.

Another particularly interesting contribution to this field is Billett's model of "relational dependencies" between social and personal ingredients to learning in the workplace (Billett 2001a, b). In line with sociocultural approaches, Billett sees learning in and through practice as related to "participatory practices" by which workers gain access to specific actions in workplace contexts. But, as pointed by Billett (2001a), "it is inadequate to believe that learning simply by just doing it will suffice" (p. 7). Both social and personal factors may either support or on the contrary hinder learning opportunities. Social factors are designated as "affordances". Affordances include for instance the sort of guidance provided to novice workers, the type of expertise available or not and more globally the range of resources workplace contexts are able to provide to learners. Personal factors are referred to as "engagement". Engagement is related to the specific ways individual workers elect to make use of the resources afforded to them in the workplace. These individual factors include for instance personal values, prior experiences and personal epistemologies. Affordances and engagement are seen as key determinants of learning in the workplace and as shaped by a relation of interdependence. Interestingly, Billett's model of "relational dependencies" between social and personal components acknowledges the contributions of language, discourse and other semiotic means to learning in professional practice. When describing efficient strategies by which close guidance may be afforded to workers, Billett (2001a, p. 144ss) proposes to see *questioning dialogues*, the production of *models* and *analogies* as processes through which workers elaborate, substantiate and extend their thinking. He thereby recognises the existence and potentialities of "scaffolding" strategies beyond the limits of the classroom and applies them to the understanding of professional learning.

From this brief inquiry into sociocultural theories of learning, it results that substantial connections exist between the "linguistic turn" taken by researchers in professional education and the ways sociolinguists approach workplace practices. In both fields, language use is seen as a major mediating tool by which individuals engage in social practices and encounter local, cultural and psychological transformations. Based on what can be seen as a strong epistemological continuity between sociolinguistic theory and sociocultural psychology, a growing number of scholars have applied discourse and interaction analytic methods for gaining a better understanding of how individuals learn in and from professional practice. This is what the next sections will illustrate and discuss.

9.2   Principles, Concepts and Methods of Interaction and Discourse Analysis

What is exactly discourse and interaction analysis and what underlying theoretical principles is it based on? There are of course many different ways to answer these questions but a common way to refer to discourse and interaction analysis is to

define it as the study of language use in relation to specific institutional and cultural contexts and with regard to its cognitive and social implications (Wodak and Meyer 2001). Discourse and interaction analysis does not constitute a unified research field but should be seen as a multidisciplinary approach made of a plurality of paradigms. The selected methodologies draw upon concepts and analytic categories from various fields of linguistics, such as interactional sociolinguistics (Gumperz 1982), conversation analysis (Sacks et al. 1978; Schegloff 2007) and critical discourse analysis (Van Dijk 1997; Wodak 1997). These fields have explored multiple avenues of linguistics and are often seen as offering competing or contradictory approaches for analysing discourse and interaction. Nevertheless, these frameworks also share common assumptions about language and social life. In particular, they view language not only as way of transferring information from speakers to recipients, but as a historical and culturally shaped medium through which individuals take actions, achieve cooperation, align identities, participate in social events and share a joint understanding of the world in which they evolve. In observing the concreted actions among members and describing how these members communicate and interact, discourse analysts examine what members produce together, what they hold each other accountable for, and how they make sense of actions of others. In doing so, they identify patterns of practice that make visible what members need to know, produce, and interpret to participate in socially appropriate ways.

Beyond the internal boundaries that delimit distinct trends and affiliations in discourse analysis, a number of concepts and methodological requirements can be seen as shared principles across interaction and discourse analysts. In this section, these principles are made visible and a range of assumptions are selected that may be helpful to understand how discourse and interaction relates to professional and practice-based learning.

9.2.1   Key Concepts in Interaction and Discourse Analysis

In what follows, four key concepts are presented and commented, that have been broadly applied in various trends in discourse and interaction analysis: *contextual indexicality*; *situated identities*; *sequential organisation* and *multimodal meaning making*. It might be arbitrary to focus exclusively on these four categories, but these concepts shape diverse properties of discourses and relate to complementary theoretical perspectives adopted in the field. They can be seen as good candidates for introducing the filed of discourse and interaction analysis.

The first concept closely related to a discourse analytic perspective is that of *contextual indexicality*. This concept relates to the idea that language use is seen as being cosubstantially linked to the contexts in which it is produced. It is indeed widely accepted amongst discourse analysts that discourses entertain multiple and complex relations with the social and material conditions in which they take place. On the one hand, discourses are often seen as being shaped by contexts in the sense that historic, cultural and material arrangements exert a form of influence on the

ways discourses are produced. But on the other hand, discourses are also shaping these contexts in the sense that participants may use linguistic resources to make visible how they interpret specific contextual arrangements (Duranti and Goodwin 1992). Within interactional sociolinguistics, Erwing Goffman's framing theory has often been used as an important contribution to such a dynamic and constructivist conception of context in discourse analysis. This theory stresses the idea that the meaning of ordinary perceptions and human behaviour is highly premised in light of natural and social "frames" (Goffman 1974). These "frames" shape the ways individuals interpret social reality and adapt their own conducts to such interpretations. Developing William James' and Gregory Bateson's ideas, Goffman considers that these framing processes are never fixed, but are vulnerable to change. People may misunderstand the meaning of contextual arrangements; they may also be abused or influenced to produce false interpretations; finally, they may also revise the meaning they attribute to the reality they experience in social life. From such a *dynamic* perspective, "contexts" can be seen as the result of a process of "contextualisation" through which participants jointly negotiate how to interpret the conditions in which social action takes place. Such a renewed perspective on context and contextualisation deeply transforms the way the relations between contexts and language in social interaction is being looked at. As put by Gumperz (1982) amongst others, language use in interaction is not only shaped by the social conditions in which it takes place, it is also "context renewing" in the sense that participants may use it as "cues" to make inferences about what the context "is" and how to initiate changes to its local configuration.

Closely related to the principle of contextual indexicality, the notion of *situated identity* has often been used by discourse analysts to understand how participants to social interaction position themselves according to each other and with regard to broader cultural and institutional arrangements. Following Goffman again, these processes of positioning are not perceived as determined by preexisting social roles, but endorsed by participants in discourse and interaction itself (Goffman 1961). It is by "doing being" a person of a certain kind that participants endorse particular identities in social action and that they place co-participants in a reciprocal position. To capture this dynamic conception of relational work in interaction, the concept of *situated identity* has sometimes been used to stress how social relations are deeply shaped by local arrangements. For Zimmerman (1998), "situated identities come into play within the precincts of particular types of situations" (p. 90). These situations are effectively brought into being by participants engaging in activities and respecting specific agendas. It is by endorsing specific roles in discourse that participants display an orientation to these situated identities and that they make visible how they align or not the social values attached to them. In that sense, situated identities are very much a product of discourse and interaction rather than a personal attribute belonging to individuals.

To understand how these contextual arrangements and situated identities are dynamically produced in discourse and interaction, the concept of *sequential organisation* has often been used to capture the local temporal processes through which interaction unfolds. The notion of sequential organisation has been primarily investigated by conversation analysts and ethnomethodologists, who see it as a

central principle underlying situated interaction (Sacks 1992; Schegloff 2007; Ten Have 2007). By using the concept of sequential organisation, conversation analysts understand that social actions jointly accomplished by a plurality of participants do not unfold in an arbitrary way but reflect a specific social order. To align to this social order and to make it visible, participants engage in fine-grained coordination processes in which they take turns, use adequate places for leaving the floor to coparticipants and orient to the successive steps by which action is accomplished. From there, conversation analysts consider the sequential organisation of talk-in-interaction as the dynamic process through which participants make their actions publically accountable and shape interpretations about what they perceive as relevant in the context. The machinery of turn-taking in interaction becomes a resource for interpreting how participants orient to each other and accomplish a joint understanding of their actions.

The sequential organisation of interaction and its contribution to the understanding of contexts and the endorsement of situated identity does not exclusively rely on linguistic units; on the contrary, it also involves a wide range of other semiotic systems participants may use as resources for coordinating their participation. To refer to this multitude of semiotic resources combined in discourse and interaction, the concept of *multimodality* has recently emerged as a solid reference point within discourse theories. Multimodal discourse and interaction analysts originate from a variety of subdomains of linguistics such conversation analysis (Goodwin 2000), mediated discourse analysis (Levine and Scollon 2004; Norris 2004) or social semiotics (Kress and Van Leeuwen 1996). These various disciplines have developed distinct approaches to discourse and interaction, but they also share a tendency to break away form a logocentric view on language and communication. The concept of multimodality relates to the plurality of semiotic modes combined in human behaviour (gestures, gazes, body movements, spatial displays, images, objects, voices, texts, etc.) and to the local arrangements through which they are used as tools for accomplishing social actions. For multimodal discourse and interaction analysts, participants are constantly engaged in complex meaning-making processes in which they have to produce a joint understanding of their actions. It is by using and combining a plurality of modes that they produce and interpret meaning in context and that they elect to orient to specific resources (or not). Considering that these choices are not arbitrary but also, to some extent, shaped by the specific potentialities of these resources themselves and the conditions in which they are used, participants also express forms of agencies through the specific ways they make use of semiotic tools in interaction. Here is another instance of the close connections that exist between semiotic forms and their psycho-social implications.

9.2.2 Methodological Implications

The concepts presented above and the theoretical principles they are aligned with have significant implications at methodological level. Discourse and interaction analysts do not all use the same research methods, but the methodologies they enact follow, at least to some extent, convergent lines that can be specified as follows.

One first way to specify the methodological requirements underlying a discursive perspective relates to the role and nature of data used for research. Empirical data is central for discourse and interaction analysis in the sense they constitute the primary material on which the analysis is based. Data consist in written, oral and multimodal behaviour through which individuals accomplish social practices in specific contexts. Discourse and interaction analysts usually do not artificially provoque the data they are putting under scrutiny. They collect these data in the natural conditions in which they occur and conduct field work to gain access to such data. From there, close connections often exist between discourse analysis and the ethnographic perspective (Gee and Green 1998). Data collection should not be seen as a capturing process from which the observer is radically absent. On the contrary, it is the outcome of a joint elaboration and the result of a complex relational process in which the researcher has progressively acquired an understanding of the observed practices and made his presence understandable and acceptable to the observed participants.

A second way to specify methodological requirements associated with discourse and interaction analysis is to comment on the sorts of technologies used for collecting data. For capturing the indexical, dynamic and multimodal nature of situated interactions, discourse and interaction analysts have progressively come to use video recordings for research purposes (Erickson 2004a; Heath et al. 2010). Video recordings of naturally occurring talk-in-interaction capture the fine-grained details of how interaction unfolds, its relations with specific material and practical arrangements, and the complex range of semiotic resources used and combined by participants. The filming of discourse and interaction itself is not perceived as an objective process that gives direct access to all aspects of social practices. On the contrary, discourse and interaction analysts consider that recordings are very much shaped by the researchers' choices and by the kind of relation researchers established with the individuals they observe. From there, audio-video recordings of naturally occurring talk-in-interaction also express subjective and intersubjective dimensions.

Discourse and interaction analysts usually never work directly on audio-video recordings but produce mediated forms of data consisting in transcripts. Transcripts give a written and synthetic form of verbal and non-verbal behaviour as they unfold on audio-video recordings. They do not capture all aspects of what is possible to perceive on these recordings but make relevant details available to the analysis by using explicit transcription conventions. Apart from conversation analysis, which has developed a well-established and explicit conventional system (Jefferson 2004), there does not exist a unique and unified convention regarding the way to produce transcripts. These norms and practices are largely dependent on the purposes of the analysis itself and have to be regarded as theoretically oriented (Ochs 1979). However, beyond these theoretical variations, discourse and interaction analysts usually align to the principles underlying their conception of language use in context. Most of the transcripts aim at capturing the dynamic and sequential nature talk-in-interaction and have progressively integrated a growing range of information related to multimodal aspects of interaction (Norris 2004).

It is based on these transcripts and the audio-video recordings they refer to that discourse and interaction analysts produce interpretations about the social practices they study. The analytic approach underlying this perspective is highly qualitative but based not only on the contents expressed in the data. Details regarding the unfolding process of interaction are seen as meaningful cues for understanding how these contents have been understood by participants themselves. From there, analytic interpretations are based both on a general ethnographic understanding of the contexts in which data has been collected and on the qualitative properties of these data and their dynamic unfolding.

9.3 Discourse and Interaction Analysis as a Tool for Understanding Professional and Practice-Based Learning

By changing the focus from the description of the linguistic system to the organisation of social action, interactional and multimodal approaches to discourse have progressively been seen as research methods beyond the limits of linguistics. In many areas of educational research, discourse analytical methods have been applied as a way to explore multiple facets of educational practices (Rex et al. 2006). In the field of teaching and learning in schools for instance, concepts and tools borrowed from conversation analysis and interactional sociolinguistics have been extensively applied to describe and understand the specific patterns of classroom interaction and the conditions under which students access knowledge in the context of the classroom (Gee and Green 1998; Macbeth 2003; Mehan 1979; Mercer and Howe 2012). Applied linguists have also adopted a multimodal perspective for understanding how teachers and students make use of multiple semiotic modes to engage complex meaning-making processes in class (Kress et al. 2001).

Recently, discourse analytic tools have also been applied in vocational and professional education research so as to account for educational practices that take place outside the specific school context. In the following paragraphs, we highlight a range of research topics that have been investigated with a methodological focus on discourse and interaction and stress how these research topics illuminate our understanding of professional and practice-based learning. To do so, we will report not only on our own work but also on a more general body of research conducted in European countries and beyond.

9.3.1 Knowledge Transmission and Acquisition

One first research area for which discourse analytic methods may be fruitfully used relates to the understanding of the complex sorts of knowledge underlying professional practice and the specific ways these knowledge are made accessible to

workers in practice. Workplace learning theories usually consider that professional learning relates to multiple sorts of knowledge, including *conceptual*, *procedural* and *dispositional* components (Billett 2001a, p. 50ss). But little is known about the ways these various components of professional learning are transmitted and acquired, and how discourse and interaction helps workers to make these knowledge visible and accessible.

In an extensive research program conducted in our team at the University of Geneva,[1] we precisely addressed these sorts of issues and aimed at understanding how apprentices enrolled in practice-based apprenticeship programs in Switzerland gain access to vocational knowledge in the different institutional contexts in which they are trained. Based on audio-video recordings of naturally occurring interactions between apprentices and various sorts of trainers, the research program was designed so as to access and describe typical discourse practices by which professional knowledge are shared between experts and novices. Various strategies for providing instruction in the workplace were identified, most of them being finely tuned to the unfolding of productive work task (Filliettaz 2009a). From the data analysis, we also observed that both vocational teachers and workplace supervisors abundantly use analogies when referring to vocational knowledge and skills (Filliettaz et al. 2010b). We described the main forms and functions and such analogical discourse and showed how it serves both cognitive and social purposes in instruction. We also described how specific contents are systematically reformulated and resemiotised when teachers and trainers give explanations to apprentices (Filliettaz et al. 2010a). And finally, we observed how workplace supervisors handle questioning dialogues in the workplace: how they respond to questions asked by apprentices and how they address questions to apprentices (Filliettaz 2011a). Our observations in this area show that answers are surprisingly neither the sole nor the dominant form of responses following questions in the workplace.

Beyond these linguistic aspects of knowledge transmission and acquisition, this same research program also allowed to investigate the role and impact of the material environment on teaching and learning processes. Building on a variety of empirical contexts including car mechanics and the building industry, we described how teachers and trainers handle technical objects and make use of the material environment in order make perceptual components of professional knowledge accessible to apprentices (Filliettaz 2007). These descriptions provide evidence to the idea that space and materiality should not be seen as a mere static setting in front of which instruction unfolds, but as a key resource shaped and designed by teachers and trainers in their everyday situated practice.

In a completely different empirical field, that of medical doctors' training in the UK, Roberts et al. (2000) also used discourse analytic methods to reveal implicit and often hidden aspects of professional knowledge. Observing that medical

doctors trained abroad and candidates from ethnic minorities were relatively more likely to fail their final examination, they questioned if the conditions in which oral examination was conducted provided equal opportunities for all candidates or if these could lead to discriminatory outcomes. By recording and analysing gate-keeping interviews in undergraduate and postgraduate medical examinations, Roberts et al. highlighted the large amount of tacit cultural knowledge candidates were expected to acquire and mobilise to participate effectively in the oral examination procedure itself. These analysis suggest that candidates from ethnic minorities may experience particular hidden difficulties with oral examinations and that examination boards should educate their examiners about these difficulties and their implications.

9.3.2 Guidance and Participation at Work and in Vocational Education

A second research area that has attracted considerable attention amongst linguists and professional educationists is that of guidance and participation at work and in vocational education. In recent years, a number of scholars have used principles of discourse and interaction analysis to understand how novice workers are assisted in their participation and the learning outcomes potentially associated with such guidance. This body of research has aimed at describing how workplace supervisors or trainers shape the ways learners engage in professional practice and how they may contribute, effectively or not, to professional learning.

In the research program on apprenticeship training in Switzerland referred to earlier, these issues have been explicitly investigated. A detailed analysis of the data resulted in stressing contrasted forms of guidance provided by trainers and supervisors in workplace environments (Filliettaz 2010a; Filliettaz et al. 2009). Two main models of training were identified in the companies observed. According to the first model, referred to as "assisted participation", apprentices were progressively introduced to various facets of productivity. They generally did not work on their own but assisted experienced workers in their tasks. These workers took in charge most of the work procedure, but afforded local opportunities for apprentices to gain access to practice, under close guidance provided by an expert. According to the second model instead, apprentices were immediately put to work and were ascribed full production work tasks very early. In this second training model, the kind of guidance provided to apprentices appeared to be more distant and less oriented by training concerns than by productivity. In close relation with this later observation, another research result consisted in underlining the collective nature of guidance in the workplace (Filliettaz 2011b). Our data showed that although apprentices were usually placed under the responsibility of specific work supervisors, they interacted with a plurality of colleagues, experts, workmates, peers, etc. when they engaged in productive tasks in the workplace. Our analysis of these data revealed that the pedagogical qualities of these distributed forms of guidance varied quite substantially

across contexts. In some cases, they took the form of complementarities and continuities across evolving steps of work tasks. In other circumstances, they consisted of misalignments or controversies between competing workers.

In the Francophone field of professional didactics, a number of researchers have also become interested in the role of "tutoring", "guidance" or "supervision" in workplace learning and have highlighted the mediating role of discourse and interaction in the ways apprentices develop skills and competences in the workplace (Kunégel 2005, 2011; Mayen 2002). In his PHD dissertation devoted to apprenticeship in the field of car-mechanics in France, Kunégel for instance describes a dynamic model capturing the relational configurations between apprentices and the supervisors at various stages of the apprenticeship pathway. Kunégel proposes to distinguish six successive steps, including a phase of "familiarisation", a phase of "instruction" and a phase of "attribution of work production tasks". The main interest of this model is to show that there seems to be a strong alignment between the level of competences apprentices are expected to display and the sorts of verbal and non-verbal interaction existing between apprentices and their supervisors. The other interesting contribution of this model is that it proposes to see these interactional configurations as evolving in time and not as given or static realities. From that standpoint, language and communication between apprentices and their supervisors function as central mediating tools for understanding the relations between practice and learning.

In a different context, that of air traffic control, Koskela and Palukka (2011), made similar observations. Applying the tools of conversation analysis and ethnomethodology, they explored the ways in which trainers and trainees act and interact in training situations and aimed at identifying methods of guidance and supervision in this particular context. By collecting and analysing video recordings and ethnographic material gathered at a vocational institute for aviation and in two aerodrome control tower units, Kostela and Palukka identified different instructional strategies by which trainers guided and controlled the trainee's actions. They showed that, as trainees progressed from simulator training to the on-the-job training phase, interaction evolved from being trainer-driven to trainer-guided. These results suggest that instructions and information deliveries are finely tuned to the trainees' performance and the local practices of particular work position endorsed at various steps of the training program.

Within the similar framework of ethnomethodology and conversation analysis, Mondada (2006) also explored patterns of interaction between trainers and trainees in work-related contexts. Her study focused on professional training in the field of surgery and aimed at identifying specific aspects of the competences trainees must acquire and display to participate adequately to complex training practices. The data used for this study consisted in audio-video recorded surgical operations available through online video conference to a group of advanced trainees. In the course of these operations, the audience had the possibility to ask questions to the chief surgeon carrying out the surgery. The analysis of these data consisted in describing the local environments in which questions were asked and the ways in which participants dealt with these questions in the complex framing context of work and training

practices. Results showed that trainees had to identify adequate positions for asking questions and that trainers' evaluations helped them in learning how and when to ask questions in such practice-based training practices. At a theoretical level, this study also highlighted specific discursive and interactional aspects related to the acquisition of professional competences. By critically discussing the concept of competence within an interactionist perspective, Mondada showed ways in which conversation analysis can inspire an approach to cognition and acquisition based on the concept of *interactional competence*, defined as relevant forms of participation emerging from social interaction.

9.3.3 Integration of Theory and Practice

Another topic that has been extensively investigated in vocational and professional education in reference to a discourse analytic methodology relates to the integration of theory and practice in learning through work. Numerous scholars have indeed addressed the issue of the so-called "theory-practice gap" and have aimed at understanding how school-based teaching and learning experiences may best prepare for, elaborate on or complete the provision of practice-based training. Here again, concepts and tools borrowed from discourse and interaction analysis have been used to stress the continuities or the gaps that may exist between the various institutional or epistemic ingredients that are combined in vocational or professional training programs.

In our own research, data analysis consisted in describing and illustrating continuities and boundaries between training practices as they take place in the various sites involved in the Swiss "dual" training system. Significant contrasts were observed with regard to the ways apprentices gained access to vocational knowledge in vocational schools and on the job. In vocational schools and training centres, tasks were generally designed to support learning and teachers or trainers referred explicitly to knowledge (de Saint-Georges and Filliettaz 2008; Filliettaz et al. 2010a). In the workplace instead, vocational knowledge was certainly not absent from production work tasks, but often remained implicit or unnoticed by apprentices (Filliettaz 2010b, c). Consequently, it was not so much the kinds of knowledge available in the various training sites of the dual system that characterised the learning experience of apprentices (conceptual vs. procedural knowledge). Rather it was also the means by which these various forms of knowledge were made available to apprentices (de Saint-Georges and Duc 2009). Special attention was also paid to the rhythmic conditions in which action unfolded in the various observed training sites (de Saint-Georges and Duc 2007; Filliettaz and de Saint-Georges 2006). In the workplace contexts, it was observed that time pressure was very quickly brought to the attention of apprentices and strongly shaped the learning opportunities associated with workplace environments. However, various sorts of responses to this time pressure were detected (Filliettaz 2009b). In some companies, workplace supervisors explicitly softened these temporal constraints for

themselves and for apprentices and allowed extra time for providing instruction. In some other companies, time pressure resulted in a lack of time for assisting the apprentice.

Also noteworthy is Akkerman and Bakker's study about vocational training practices in the Netherlands (Akkerman and Bakker 2012). Deploying the theoretical notion of boundary crossing, the authors conducted field work and ethnographic observation in a Dutch senior secondary vocational laboratory education program and investigated the actions and interactions taking place between school and work during apprenticeships. The study aimed at taking into account both cognitive and identity-related aspects of learning. It consisted in analyzing how apprentices' experiences at work were discussed and reflected upon with students and teachers at school. The findings revealed that what students were expected to learn in work-related practices was largely rendered invisible by the technology-mediated, scripted and socially distributed nature of their work. From there, release days seemed to provide initial ways to explicate and reflect with teachers on what was going on at work. They functioned as useful contributions to vocational learning and provided a good illustration of how school and work institutions can mutually feed each other in facilitating apprentices' learning. Here again, a fine-grained analysis of talk-in-interaction collected in training sessions during release days was used a means to understand the sorts of learning experiences made by apprentices across various training institutions and practices.

In a rather different empirical context, the research conducted over the past 15 years at the Victoria University of Wellington in the so-called Language in the Workplace Project (LWP) also contributed in a significant way to use sociolinguistic methods for integrating theoretical and practical aspects of professional education. Since 1996, Janet Holmes and her team began an innovative study of spoken communication in New Zealand workplaces aiming at identifying the characteristics of effective communication between workers, diagnosing possible causes of miscommunication and exploring possible applications of the findings for New Zealand workplaces. Data collection began in government organisations and was progressively expanded to factories, small corporate workplaces, medical settings and IT companies. Volunteers in each organisation audio-taped everyday work-related meetings or discussions, telephone calls or social conversations. Detailed and systematic analysis of these data resulted in highlighting the complex sociopragmatic skills displayed by workers when collaborating with colleagues (Vine 2004), doing relational work (Holmes and Stubbe 2003) or exerting leadership at work (Holmes et al. 2011b). Recently, the data and findings gathered in this particular research area were also used as teaching material for migrant workers and as support for the provision of a curriculum addressed to workers with specific linguistic and sociocultural needs (Holmes et al. 2011a, b). In an academic context, learners with a migrant background learnt to identify the sociopragmatic demands of the workplace by observing and analysing empirical data collected in workplace contexts. Later on, they also used workplace experiences to make use of what they learnt and to reflect on these sociopragmatic skills.

Such integrated teaching and learning methods were progressively applied extensively in New Zealand programs for skilled migrants. They showed promising results for integrating theoretical and practical aspects of second-language acquisition in professional contexts.

9.4   Learning Through Practice as an Interactional Accomplishment

Beyond the general description of the sorts of research topics that have been recently investigated with a discursive lens, it is also important to understand how analytic tools borrowed from discourse and interaction analysis can be effectively enacted to address subjects of increased attention in vocational and professional education. In this section, these contributions are illustrated by narrowing down the scope on the topic of learning through practice and by investigating the role of contextual variation in the ways workers experience learning in professional practice. These learning experiences and contextual variations are seen as accomplished in and through interactions between co-workers and the social and material environment in which they engage.

Numerous scholars in the field of workplace learning have stressed the idea that workplaces are not equal in the resources they provide to learners and that their qualitative properties may differ in substantial ways (Tynjälä 2008). For example, Fuller and Unwin (2003) have presented a continuum of restrictive vs. expansive organisations with regard to how these support workplace learning. *Restrictive* environments are characterized by the fact that they afford limited opportunities for apprentices to be recognised as legitimate learners and learning from their work. On the contrary, *expansive* work environments are supportive to learners, afford rich learning tasks and generate opportunities for apprentices to be recognised as legitimate learners and workers. This distinction, which should be seen as a continuum, argues for the configuring role of contextual variation in learning for and from practice.

From that standpoint, it becomes increasingly important to understand how contextual arrangements in the workplace may influence learning opportunities and enhance consistent pathways through practice-based training programs. It becomes also necessary to understand the role played by skilled professionals in helping novice workers to learn in and from practice and to assist these professionals to reflect on the resources they need to use to adapt the workplace into a training site. Moreover, addressing these challenges from a research perspective raises a number of theoretical and methodological issues: how do contextual and individual factors interact in the possibility for workers to learn in and from practice? How can learning opportunities in the workplace be defined, observed and understood? How can one account for contextual variation across workplace environments and identify contextual arrangements that support learning opportunities?

To illustrate the benefits of a discursive and interactional perspective for understanding contextual variation and its impact on learning in and from practice, we now turn to empirical material collected in the context of the above mentioned research program dedicated to apprenticeship training in Switzerland. In the following sections, two contrasting case studies are provided, documenting how fist-year apprentices engage in work-production tasks in two different companies located in the Geneva area. The two training sites belong to the trade of car mechanics and involve first-year apprentices at the very beginning of their apprenticeship. The first case refers to the mechanics workshop of a large public facility. It involves Michael, a first-year apprentice in mechanics and Larry, his official supervisor and manager of the repair workshop. The second case refers to a small-sized private car repair shop, hiring Samuel as an apprentice. Samuel is supervised by Jeff, a skilled mechanics who has no official tutoring functions towards apprentices.

The participants belonging to these two work and training sites have been observed regularly on a voluntary basis during several weeks in spring 2006. With their consent, observations were video recorded by the researchers. These recordings took place after a period of preparation during which participants got used to the presence of the researcher and a relation of mutual confidence was established between partners. By observing and analysing brief excerpts of audio-video recorded data documenting naturally occurring interactions between these apprentices and their trainer, the following range of questions will be addressed, related to the general theoretical frame mentioned above: What sorts of learning opportunities are being afforded to apprentices in these two distinct workplaces and how do apprentices engage with these opportunities? How do workplace supervisors and apprentices reconcile production constraints with training and learning purposes? In what sense can these work and training environments be regarded as expansive or restrictive forms of participation? And what are the contributions of discourse and interaction to the ways participants shape and transform the local contexts in which they engage?

## 9.4.1 Transforming a Maintenance Procedure into a Teaching Sequence

The first case relates to a car repair shop belonging to a large public facility (Company A). Michael (MIC), a novice apprentice, works in close collaboration with Larry (LAR), an experienced mechanic who acts as a supervisor and trainer within the workplace. Both the apprentice and his supervisor are conducting a maintenance procedure on a truck. At the beginning of the excerpt transcribed next, they initiate a new task included in the maintenance procedure: the cleaning and fine-tuning of the valves located at the top of the six cylinders composing the engine. Michael and Larry are standing next to each other, in front of the open hood of the lorry, when Larry initiates the following sequence of interaction.

9.4.1.1   Interaction in Company A[2]

```
1.   LAR:  I'm trying to find a way to turn the engine so that we can
           access the cylinders\ . there should be a gear door below I'll
           go and get a gurney\
2.   MIC:  yeah\
3.   LAR:  what you can do meantime you look where the inlet and exhaust
           valves are located
4.   MIC:  I've already found them\
5.   LAR:  really/. and/
6.   MIC:  ((points to the valves on the engine)) exhaust/ inlet/ inlet/
           exhaust/ exhaust/ inlet\
7.   LAR:  OK that's correct\ . firing order of a six-cylinder engine/
8.   MIC:  I haven't learnt that yet\
9.   LAR:  1-5-3-6-2-4\
10.  MIC:  1-5-3-6 I'll write it down\
11.  LAR:  here take a sheet of paper ((gives a piece of paper to MIC))
12.        you write 1-5-3-6-2-4\
13.  MIC:  ((writes the sequence of numbers on the paper)) [#1]
14.  LAR:  OK now that you have the firing order you find out which
           cylinder is connected to each valve\
15.  MIC:  OK\
16.  LAR:  and meantime I'll go and get a gurney\
17.  MIC:  ((MIC observes the engine and writes down the solution on a
           sheet of paper)) [#2]
18.  LAR:  ((comes back with a gurney))
19.        so/
20.  MIC:  I think each cylinder with its opposite\ . the first with the
           sixths/ the second with the fifth/ and the third with the
           fourth\
21.  LAR:  well done/ . so let's have a look\
```
[…]

#1: Michael writes the firing order of the engine on a sheet of paper
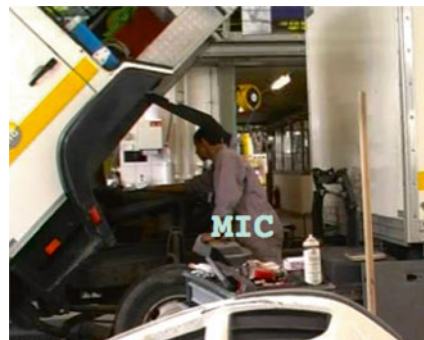
#2: During Larry's absence, Michael observes the cylinders and valves composing the engine

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[2]The original recorded data are in French, and the transcript provided here is a translation. Transcription conventions are given in the Appendix at the end of the chapter.

According to Kunégel's dynamic model of tutoring (Kunégel 2005), a specific type of guidance or training model—that of *assisted participation*—can be recognised in the excerpt just presented. Michael, the apprentice, is not working on his own or in isolation from other workers; rather, he is closely supervised by Larry, who spontaneously provides guidance and takes responsibility for conducting the maintenance procedure. At the beginning of Excerpt 1, both Michael and Larry face a specific practical problem related to the "productive" dimension of their work. To turn the cylinders in order to place them in an adequate position, they must access a gear door located below the engine. This requires the mechanics to lie on the back below the lorry and to use a sort of gurney to work in a comfortable position. Since the gurney is stored in the basement of the workshop, the supervisor proposes to leave the apprentice alone for a moment while he looks for the gurney.

Interestingly, the trainer does not see this practical problem as a mere production episode, but presents various learning opportunities to the apprentice before leaving him alone. First, Larry provides a verbal account of the problem and explains why he needs a gurney for cleaning the valves of the engine (1). Second, he makes three successive attempts to place the apprentice in an active position for when he will remain alone. The first attempt consists of asking the apprentice to find out where the inlet and exhaust valves are located ("What you can do meantime you look where the inlet and exhaust valves are located", 3). The second attempt consists of checking whether or not the apprentice remembers the firing order of a six-cylinder engine ("firing order of a six-cylinder engine?", 7). And, the third attempt consists of the supervisor asking Michael to figure out which cylinder is connected to each valve ("OK now you have the firing order you find out which cylinder is connected to each valve", 14). From the apprentice's perspective, it is also notable that Michael is closely aligned to the verbal exchanges initiated by Larry. He anticipates the trainer's instructions ("I've already found them", 4), takes note of his explanations (10, 13), and provides correct answers to his questions (6, 20).

In doing so, both Larry and Michael considerably change the local contextual arrangements underlying the interaction. They progressively transform a production procedure of maintenance into a setting in which technical knowledge emerges as a central ingredient. The trainer is not only working with the apprentice at this stage; he is teaching the apprentice how an engine operates and how its main components interact. This contextual shift from "production" to "construction", to quote the terminology introduced by professional didactics (Pastré et al. 2006), requires the use of a wide range of multimodal resources, including talk, body orientations, gaze, gestures and material objects. Noteworthy is the fact that this contextual shift involves a specific use of the material environment, a use in which technology does not only produce specific physical results but also supports an indexical reference to knowledge. It is by observing the engine and pointing to its various components (cylinders, valves, etc.) that both the trainer and his apprentice produce a joint conceptualisation of how an engine operates (6). As shown in the excerpt, this process of contextual shift requires a fine-grained alignment between both participants, namely, the supervisor being willing to train and the apprentice being willing to engage in learning opportunities.

9.4.2   Maintaining Production as a Dominant Action Frame

In other companies, such expansive learning opportunities tend to be scarce or they may be based on different interactional configurations. To illustrate this, a second example will be used, observed in a privately owned car repair shop in the Geneva area (Company B). Samuel (SAM), a first-year apprentice, is busy conducting a maintenance procedure on a small-sized passenger car, when, whilst going through the procedure step by step, he does not remember if he should change the spark plugs or not. To clarify this issue, he moves away from the car and addresses Jeff (JEF), an experienced mechanic working in another area of the workshop.

9.4.2.1   Interaction in Company B

```
1.    SAM:  ((moves towards JEF))
2.          JEF/ eh: the spark plugs on the Sonata\ ..
3.    JEF:  yes and so what/
4.    SAM:  should I change them/ . there are three of them\ . no/ I don't
            know about the Sonata\
5.    JEF:  ((looks at SAM silently)) [#1]
6.    SAM:  these are platinum spark plugs then/
7.    JEF:  ((looks at SAM silently)) [#1]
8.    SAM:  yep I guess these must be platinum ones\
9.    JEF:  ((looks at SAM silently)) [#1]
10.         go and check in the Hyundai documentation\ ((points towards an
            office located next to the workshop))
11.   SAM:  OK\ . ((moves towards the office and reads the documentation))
            [#2]
12.         ((comes back to JEF))
13.         right I don't need to change them\
[…]
14.   JEF:  you should know these things\ I told you to do a 30000km
            maintenance and not a 90000km one\ at 30000km one doesn't need
            to change the spark plugs but you keep forgetting these things
            all the time\
15.   SAM:  sorry I didn't remember\
```


#1: Jef looks at Samuel silently instead of responding to his question

#2: Samuel reads the documentation to find the answer to his question

First, it can be noted that a rather different participation configuration applies to this second example. Samuel, the novice apprentice working in this garage, is fully responsible for accomplishing work production tasks on his own and he is immediately experiencing strong expectations regarding autonomy. His supervisor, Jeff, is not exclusively dedicated to training tasks but is also engaged with various specific and distinct repair and maintenance activities. This has significant implications in terms of learning and access to knowledge. These resources are not spontaneously provided to Samuel, but have to be requested by the apprentice. When facing practical problems in the maintenance procedure, Samuel has to initiate and negotiate changes in the overall participation configuration underlying the workplace context. He has to interrupt his supervisor and request assistance and information (1, 2).

Interestingly, in this particular case, Jeff does not engage immediately or easily in this request for assistance, but displays various forms of resistance to answering Samuel's question. First, he does not seem to pay attention to Samuel's question, but goes on working without interruption (3). Then, he does not provide verbal answers, but keeps on looking at the apprentice with anger (5, 7, 9). He finally refers to the documentation and asks the apprentice to find the answer himself ("go and check in the Hyundai documentation", 10). After the apprentice comes back with the answer, Jeff blames Samuel for his lack of autonomy and for forgetting important information repeatedly (14). These particular responses to Samuel's request for assistance have a clear impact on the ways in which the apprentice engages in interaction at this stage. First, Samuel has to rephrase his initial question addressed to Jeff ("should I change them? There are three of them. No? I don't know about the Sonata", 4). He is then implicitly prompted by his supervisor's insistent and disapproving gaze to come up with an answer, and has to make guesses about how to deal with spark plugs in the existing context (4, 6, 8). He also has to find out the answer on his own by referring to some documentation (11). Later, when coming back from the office, he accounts for the solution to his problem ("right I don't need to change them", 13), and responds to the trainer's blaming him by producing an action of symbolic repair in the form of an apology ("sorry I didn't remember", 15).

In sum, it appears that the local context remains strongly shaped by production constraints in this second example, and that, in contrast with the first case, work activities are not being reframed as explicit learning opportunities. The trainer seems to retain knowledge and expresses resistance to interrupt his work for the sake of providing assistance to the apprentice. Elements of technical knowledge are certainly not absent from this sequence of interaction, but these elements of knowledge are not developed into a local teaching and learning opportunity. They do not reshape the ways in which the participants engage in the local context, at least not to the same extent that could be observed in the previously described case. This results in a form of misalignment between the apprentice's need for immediate guidance and the sort of resources his supervisor is willing to provide. In the end, a climate of potential conflict and relational tension emerges between Samuel and Jeff, which illustrates a typical form of restrictive learning environment (Fuller and Unwin 2003) in which the apprentice is recognised as part of the workforce and not foremost as a legitimate learner.

From what was observed in the two case studies, it appears that apprentices experience rather diverse learning environments depending on the company in which they are trained. These environments differ in terms of access to knowledge, the willingness of supervisors to provide adequate guidance, and with regard to participation formats through which apprentices are expected to engage in production work tasks. These environments also have an impact on the learning opportunities that workplaces are able—or not able—to create for learning workers. In some training companies, apprentices are closely assisted in their work, and learning opportunities may arise in the form of explicit teaching practices. In some other companies, apprentices are expected to be productive and autonomous very quickly, and training practices are perceived as interruptions conflicting with production constraints.

It also appears that contextual variation is not only visible *across* workplaces, but also *within* each training site. Variation takes the form of a dynamic process shaping social encounters. Ordinary workplaces may evolve into virtual teaching arenas or, to the contrary, may remain highly determined by production constraints. Workplace supervisors and apprentices play an active role in the ways that these contextual shifts can be operated locally. It is by engaging in interaction and by using a complex range of multimodal resources that they produce or reproduce the conditions in which they work and learn. They may express an openness to forms of "contextual fluidity" and flexibility or may resist operating local transformations of these contextual arrangements.

9.5   Challenges and Potentialities of Discourse and Interaction Analysis

In this chapter, arguments have been brought in favour of an epistemological compatibility between sociocultural theories of learning and approaches to discourse and interaction developed within the broad field of sociolinguistics. In line with Gee and Green (1998), it has been considered that "the approach to learning that is most compatible with an ethnographically grounded perspective on discourse analysis is one that defines learning as changing patterns of participation in specific social practices within communities of practice" (p. 147). Through a brief literature review and a case study based on empirical data, concepts such as *contextual indexicality*, *situated identities*, *sequential organisation* and *multimodality* have been seen as candidates for approaching learning as participation in specific contexts and communities of practice. It has also been illustrated how a fine-grained analysis of discourse and interaction may contribute to an advanced understanding of both cognitive and identity-related aspects of professional and practice-based learning. To conclude, additional considerations are brought to this epistemological continuity and the challenges associated with the discursive methodology for research are discussed as well as its potentialities for practice.

9.5.1 Challenges for Research

When adopting a discursive or interactional perspective in their investigations, researchers in professional and practice-based education face numerous challenges that deserve close attention. These challenges include both ethical and methodological aspects, which are specified below.

First, it should be highlighted that increasing ethical demands are closely associated with discourse and interaction analysis. The methodological perspective being grounded on situated empirical data and these data being intrinsically related with social practices, it is important to recognise the potentially damaging and exploitative effects data collection could have on the observed participants. Discourse and interaction analysis is not and has never been a neutral enquiry into human behaviour and institutions. It contributes to the visibility of social practices and may have an impact on the positions endorsed by participants within institutions. This stresses important requirements related to access to data, permission to make use of these data and ethical clearance for research. But more interestingly, it also progressively transforms the conditions in which researchers and observed participants interact and position themselves with regard to each other (Sarangi and Candlin 2003). As noted by many discourse analysts, researchers tend not only to apply their expertise and categories to the social practices they scrutinise, but also to negotiate complex forms of collaborations with practitioners they observe. In other terms, research methods have progressively moved away from a research "on" social practices towards empowering forms of research conducted "for" and "with" practitioners themselves. As put by Cameron et al. (1994) "we understand *empowering research* as research *on*, *for* and *with*. One of the things we take that additional "with" it imply is the use of interactive or dialogic research methods, as opposed to the distancing or objectifying strategies positivists are constrained to use. It is the centrality of interaction "with" the researched that enables research to be empowering in our sense" (p. 22).

Beyond these ethical considerations, the type of research illustrated in this chapter maps important methodological challenges for the development of discourse analysis as an applied resource for research on professional and practice-based learning. First, the type of analytical approach presented here stresses the relevance of a *multimodal perspective* that does not see talk as the sole or the main medium through which social interaction unfolds. As illustrated by our empirical analysis, the apprentices' learning experiences in the workplace do not rely on language exclusively but also on a wide range of other semiotic resources. It is by positioning themselves in material environments, by establishing visual contact with partners, by pointing specific locations and artefacts, etc. that participants enact interactional participatory practices and negotiate learning opportunities in work production contexts. Secondly, the methodology underlying discourse and interaction analysis stresses the potentialities associated with a *contrastive perspective*. Highlighting contrasts from one context to another and from one interactional configuration to another may illuminate, as in Michael's and Samuel's case, mechanisms of

contextual variation and differentiation in learning through practice. They may also contribute to "scale up" local findings resulting from microscopic qualitative analysis and link them with macroscopic realities observable at broader social levels (Erickson 2004b). Finally, the type of research presented in this chapter also brings interesting arguments to the development of methods that aim at "opening up the scope of discourse analysis" (Scollon and Wong Scollon 2003) by integrating a dynamic and *longitudinal perspective*. Through a detailed multimodal analysis of sequences of interaction collected in various contexts and at different steps of training programs, discourse and interaction analysis reveals the interactional micro-mechanisms through which knowledge is acquired and identities tend to sediment and become more and more fixed in time. Such a longitudinal perspective is often regarded of primary importance to understand how apprentices' journey from the periphery of a learning community to its centre is reflected in the interactional processes. In our own research, we also take this longitudinal perspective as a very promising method for investigating "situated trajectory of learning" and understanding both successful and problematic ways of experiencing transitions from school-based teaching towards practice-based learning (Duc 2012; de Saint-Georges and Filliettaz 2008; de Saint-Georges and Duc 2009).

9.5.2 Potentialities for (Transforming) Practice

What are then the potentialities associated with discourse and interaction analysis for change and what may be its impact on educational practices? Mercer and Howe (2012) seem to make rather pessimistic claims regarding school education and observe that "sociocultural concepts and research findings seem, so far, to have had relatively little impact on educational policy and practice" (p. 17). Is this also true for vocational and professional education and training? In our view, significant practical implications derive from discourse an interaction analysis, as long as it is not narrowly conceived as an abstract methodology but serves to address broader social and educational concerns.

One first area in which discourse and interaction analysis could benefit our understanding of practice-based learning relates to the status and place of language and discourse in vocational and professional training curriculum. Interestingly, when exchanging with vocational trainers, teachers, managers or policy makers, "language" is often regarded as a limited or even narrow issue, related almost exclusively to specific contents of teaching and learning and associated mainly with the classroom context. For most apprenticeship programs available in Switzerland at upper secondary level, the curriculum indeed includes first and second language teaching courses. However, language use is rarely regarded as being involved in other areas of the curriculum and as exerting a more global influence on the conditions under which apprentices encounter learning experiences in and across the various contexts in which they are trained. To most practitioners in the field, the social visibility of language seems to be limited to the classroom context and

remains external to the workplace. A discursive and interactional methodology, on the contrary, advances a new perspective for approaching the role of language and discourse in vocational education, a perspective that sees these ingredients not as peripheral components of the training curriculum, but rather as central mediating tools for vocational learning. According to this perspective, apprentices are not only exposed to vocational knowledge in the range of contexts in which training takes places. They also encounter specific discourse practices and face numerous and often implicit or invisible expectations regarding the ways these discourses may be enacted and conducted. It is by engaging with these discourse practices that apprentices gain access to knowledge, develop practical skills and may endorse legitimate social positions within the multiple communities they belong to during their training. These language and communication skills are neither transparent nor self-evident. Like other components of vocational training, they have to be seen and most importantly learnt. Obviously, some apprentices are very successful in identifying and acquiring the specific discursive demands underlying the range of practices included their training program. Some others are not and may encounter rather challenging experiences in their journey to a professional qualification.

This later point provides a direct transition towards a second possible practical implication for discourse and interaction analysis in vocational and professional education. One area in which the type of research presented here may have significant outcomes is indeed the understanding of problematic transitions from school to work. In the context of Switzerland, but in other countries as well (Filliettaz 2010b), increasing attention has been paid in recent years to the high level of non-completion, dropout and change in apprenticeship pathways. Depending on the occupations and the geographical areas, between 20 and 40 % of apprentices who enter the dual VET system do not complete their apprenticeship within the stated terms of their contracts (Stalder and Nägele 2011). Of these: 9 % change occupation, 11 % have to repeat a year, 7 % change the training company, and 7 % drop out from the apprenticeship system without having any immediate alternative pathway. Recent studies have investigated the causes leading to young people dropping out or making changes in apprenticeship programs (Lamamra and Masdonati 2009). These studies depict a nuanced portrait of the dual VET system and show that transitions from school to work are to some extent far from smooth and unproblematic. They conclude that poor working conditions, low support by trainers and workplace relations emerge as the main causes leading to dropout. Elaborating on these findings, the strength of a discourse analytic methodology applied to vocational education practices lies in its capacity to reflect not so much on the "causes", "reasons" and "factors" that may lead to incomplete training pathways or delayed transitions to employment, but to understand the *processes* by which these causes and factors are being enacted in practice, how attrition is constructed in action, and how apprentices, trainers and workers are experiencing relational and practical issues when engaging into work.

Beyond data description and analysis, what then are the contributions researchers could propose in order to promote changes in the realities they investigate? One particularly promising avenue currently being explored by our team at the University of Geneva is to use the empirical material available in the context of training

programs addressed to vocational trainers. As shown by the studies presented in this paper, vocational trainers in the workplace play an active role in shaping local contextual arrangements that are able to support robust learning opportunities in production conditions. In consonance with Billett's findings (Billett 2001a), the research results presented here show an urgent need to increase the level of pedagogical qualification and awareness of trainers in the field of vocational education in order to enhance the overall quality of the guidance provided in workplaces. In the training sessions we have proposed recently in various institutional contexts (Filliettaz 2012), vocational trainers of different sorts develop analytical skills in the field of discourse and interaction analysis and apply their analytical skills to empirical material collected during our research program. By combining conceptual input about social theories of vocational learning with empirical data analysis, they progressively learn to identify expansive and restrictive interaction configurations and discuss in groups about their views. Being sensitive to "contextual indexicality", "sequential organisation" and "multimodality" does not solve the complex issue of attrition in apprenticeship programs. However, from our own experience as researchers and as adult educators, it can render the sorts of difficulties faced by learners when joining the workplace visible, and it can also help trainers and experienced workers to become more reflexive about their role when it comes to assist novices in learning for and from practice.

As illustrated here, discourse and interaction analysis may appear remarkably remote from generalisable strategies and recommendations. This could be seen as a weakness and as a form of limited impact on the provision of education. But as mentioned by Gee and Green (1998), "we can also point out that it is highly improbable that answers to many of the questions facing those concerned about learning in social contexts require generalizable strategies or recommendations" (p. 160). In other words, the main outcomes of discourse-oriented methodologies for understanding learning for work seem to lie elsewhere. They rely on their capacity to illuminate questions that require local and highly situated answers.

Appendix: Transcription Conventions

CAP	Accented segments
/	Raising intonation
\	Falling intonation
XX	Uninterpretable segments
(hesitation)	Uncertain sequence of transcription
:	Lengthened syllable
.	Pause lasting less than one second
..	Pause lasting between one and two seconds
Underlined	Overlapping talk
((*comments*))	Comments regarding non-verbal behaviour
[#1]	Reference to the numbered illustration in the transcript

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