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Affording learning environments in workplace contexts: an interactional and multimodal perspective

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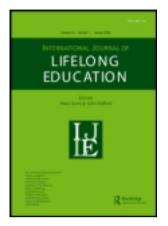
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Affording learning environments in workplace contexts: an interactional and multimodal perspective

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The present article seeks to contribute to reflections about learning in and through practice by addressing some general questions about the role of action and context in work-related training practices. It aims at a better understanding of the conditions under which work-production environments may or may not afford rich learning opportunities to novice workers. How can workplaces produce learning environments for newcomers in a profession? Under what conditions may workplace practices support learning opportunities or, on the contrary, generate obstacles to such opportunities? How can one assist vocational trainers or workplace supervisors to shape adequate learning environments in work-production contexts? To address these general questions, the article adopts a specific theoretical and methodological perspective, linking social theories of vocational learning with concepts and analytical tools borrowed from the fields of sociolinguistics and applied linguistics. It is proposed that an interactional and multimodal approach, based on a fine-grained analysis of discourse and interaction between learners and trainers, may inform about the challenges faced by both learners and trainers in practice-based training programmes. In the present article, these claims are elaborated and illustrated with empirical data gathered in the context of apprenticeship programmes as they are implemented in Switzerland.

Professional and vocational learning, and the educational and practice-based experiences that support it, are currently the subject of increased attention in the fields of educational, psychological, sociological, and business management research. They are also becoming a priority for governments, employers, professional bodies and unions, who are concerned about developing and sustaining competent workers to meet important social and economic goals. The challenges met in this field are numerous, and include a wide range of aspects and questions such as: how may learning in and from practice contribute to consistent forms of transitions from school to work? Can work-production contexts be seen as adequate training environments for newcomers in a profession? What roles and responsibilities are endorsed by employer organisations, companies and experienced workers in providing work environments that may afford rich and efficient learning opportunities to learning workers?

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In Switzerland, for instance, these questions have turned to become particularly significant, in a context where more than 60% of young people completing compulsory education elect to enrol in vocational education and training (VET) programmes, most of them including an important part of practice. Among the 82,000 students who commenced VET in 2008, 80% enrolled in apprenticeship programmes, and only 20% opted for school-based vocational training (Federal Office for Professional Education and Technology 2012). This means that apprenticeship training, in what is called the 'dual system', still remains the predominant form of upper-secondary education in Switzerland. This dominant training model is called 'dual' because it comprises a combination of multiple training sites, associated with a plurality of partners. Apprentices are trained in productive conditions by working in a company for three or four days a week; they undergo complementary teaching sessions in vocational colleges for one or two days a week; and finally, they attend so-called cross-company courses hosted by professional associations at various stages of their training programmes with the aim of learning complementary knowledge that is difficult to secure in the productive conditions of everyday work.

Such a dual training system is based on the assumptions that workplaces are suitable environments for learning and that work-production practices play a key role in the development of professional skills and competences. This training model is also rooted in the idea that professional teachers and trainers are not the only partners available to provide apprentices with learning experiences. Ordinary experienced workers are recognised to play an important contribution to apprenticeship programmes, even though they are not necessarily qualified or trained for such pedagogical tasks.[1]

Although apprenticeship programmes within the dual system have recurrently been reported as efficient strategies for securing employment and supporting smooth transitions from school to work, significant problems have emerged in these programmes during the last few years (Gonnon 2005, Dubs 2006). One problem that has attracted increasing attention in recent years is 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). Overall, 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 of or making changes to their apprenticeship programme (Jordan *et al.* 2010, Lamamra and Masdonati 2009). These studies conclude that poor working conditions, low support by trainers, and workplace relations emerge as the main causes leading to dropout. These studies also underline the high level of variation regarding the work conditions apprentices encounter in their apprenticeships.

From that standpoint, it becomes increasingly important to understand how contextual arrangements in the workplace may influence learning opportunities and enhance consistent pathways through the apprentice programme. It also becomes necessary to understand the role played by skilled professionals in helping apprentices 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.

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.

In a research programme recently conducted at the University of Geneva,[2] these various issues have been addressed by developing methodologies linking social theories of vocational learning with analytical tools borrowed from the fields of sociolinguistics and applied linguistics. Analysing discourse and verbal interaction among apprentices, trainers and workers, it is proposed, can contribute to a better understanding of the diverse, contrasted and complex learning conditions apprentices encounter in their early days of work.

In the present article, the main methodological orientations and some findings of this research programme are discussed and the potential and limitations of practice-based models of training in VET are critically appraised. The article commences with theoretical considerations and elaborates a conceptual framework based on social theories of learning for approaching the topic of learning through practice and contextual variation. Methodological orientations are then discussed and the principles of an interactional and multimodal perspective are explained. In the third section, these theoretical and methodological assumptions are illustrated with empirical data documenting naturally occurring interactions between first-year apprentices and vocational trainers in work-related contexts. Two case studies referring to distinct workplaces depict contrasting conditions experienced by apprentices in their early days of work and provide evidence for the configuring role of workplace supervisors in mediating the apprentices' work and learning experiences. In a concluding section, the theoretical, methodological and practical implications resulting from the proposed approach are discussed. In particular, an alternative approach to the concept of 'contextual variation' is elaborated and innovative pedagogies are presented to assist companies and workplace supervisors in affording rich learning environments in workplace contexts.

Conceptualising learning through practice

Approaching the field of learning through practice does not only involve a specific cultural and empirical background. It also requires explicit theoretical elaborations. In this section, the conceptual ingredients of this theoretical frame are listed and explored. These ingredients borrow ideas elaborated in a variety of domains, ranging from historico-cultural psychology, workplace learning and Francophone professional didactics. These domains express converging perspectives and see vocational learning processes as intrinsically embedded in social action and hence as highly contextual, collective and dynamic.

Social theories of learning have recurrently underlined the collective and distributed nature of learning processes and the configuring role of 'others' in the

ways individuals access and interiorise knowledge and develop skills. The Vygots-kian concept of the zone of proximal development (ZPD) defined as 'the dis-tance 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: 85) is often regarded as a central reference point for approaches that see learning processes as involving a plurality of agents. From such a 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, in this framework, appears as an important condition for expanding the ZPD and for developing problem-solving skills.

By transferring the concepts of guidance and the ZPD beyond the limits of the classroom, contemporary approaches to vocational learning have promoted new ways of understanding the relations between work and learning. In this respect, convincing alternatives to the distinction between formal and informal education have been advanced (Guile and Young 1998, Evans *et al.*, 2006). In Lave and Wenger's anthropological approach to apprenticeship, for instance (Lave and Wenger 1991, Wenger 1998), participation in communities of prac-tices is seen as an important means by which newcomers gain access to knowl-edge 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 condi-tions, 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, 2001b). In line with socio-cultural approaches, Bil-lett 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 out by Billett (2001a: 7), 'it is inadequate to believe that learning simply by just doing it will suffice'. 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.

Consistent with Billett's reflections about the ingredients of workplace learn-ing, other models of learning from practice have attempted to capture the quali-tative properties of workplaces. For example, Fuller and Unwin (2003) have presented a continuum of restrictive versus expansive organisations with regard to how these support workplace learning. Restrictive environments are character-ised 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 is not a binary one but can be seen as a continuum.

In the Francophone field of 'professional didactics' (Pastré *et al.* 2006), complementary and significant contributions to the conceptualisation of learning through work have been proposed. Based on a complex epistemological background combining a Piagetian framework with the Vygotskian developmental theory, representatives of this current of thought establish a theoretical distinction between 'productive' and 'constructive' dimensions of social action. Action, they say, is at the same time 'productive' and 'constructive'. It is productive in the sense that it transforms the physical world and produces visible outcomes on the material level. But action is also 'constructive' in the sense that it transforms the internal world of the workers, their beliefs, knowledge, dispositions and the repertoire of resources they need for working. Social practices may involve in various proportions 'productive' or 'constructive' dimensions of action, but these two ingredients are always present. Professional didactics has become an increasingly useful analytic frame for understanding how experienced workers conceptualise their practice and how specific training programmes may be based on such conceptualisations. Professional didactics has also become interested recently in the role of 'tutoring', 'guidance' or 'supervision' in workplace learning. Research conducted in this perspective has highlighted the mediating role of workplace supervisors in the ways apprentices develop skills and competences in the workplace (Mayen 2002, Kunégel 2005). In his PhD dissertation devoted to apprenticeship in the field of car mechanics in France, Kunégel 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 sort 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 are seen as central mediating tools for understanding the relations between practice and learning.

Researching learning through practice from an interactional and multimodal perspective

As shown previously, the complex processes that shape learning through practice are very much premised on language-use and communication. Training and learning occur in ordinary activities, in which individuals, for example, provide or receive instructions, share views, solve problems, display interpretations or evaluations of others' conducts. In other words, learning to work and becoming a member of professional communities very much rely on discourse and interactions. Consequently, adopting a qualitative methodology

based on a fine-grained analysis of such discourse and interaction processes can be seen as a promising resource for understanding how apprentices learn from practice and how they are assisted in their learning by experienced workers.

Over the last decades, a growing number of linguists have become interested in considering language not as an abstract symbolic system representing meaning and describing the world, but as a mediating tool for accomplishing social action in context (Bronckart 1997, van Dijk 1997). By using language and engaging in communication processes, speakers not only transfer information to designated recipients; they also accomplish complex social actions in specific institutional settings. Known as the 'discursive turn', this area of linguistics has deeply transformed the traditional methods by which linguists analyse and understand language. Rather than describing abstract grammatical forms, linguists have become involved in observing complex social practices and describing these practices from the perspective of their linguistic accomplishment. This requires a presence of the researcher on the filed and a detailed data collection consisting of audio-video recordings of naturally occurring talk and interaction.

Within the body of research adopting a social and discursive view on language-use, two specific perspectives deserve particular interest. The first focuses on the concept of 'interaction' and sees social action as jointly accomplished by a plurality of participants; the second focuses on the concept of 'multimodality' and stresses the role of semiotic diversity for accomplishing joint actions in context.

An interactional perspective on discourse and communication sees language-use as a collective production and as the means through which social actors coordinate their participation to joint actions. Based on social theories of action such as ethnomethodology (Garfinkel 1967) or the microsociology of everyday life (Goffman 1959, 1974), these approaches investigate the fine-grained cooperation processes through which participants take actions, produce and share knowledge or endorse specific identities and roles in context. These ingredients are perceived not as pre-existing to the social encounters but as jointly accomplished by participants themselves in the dynamic unfolding of interaction. For instance, conversation analysts have proposed to consider the sequential organisation of 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 (Sacks 1992, Schegloff 2007, Ten Have 2007). From that standpoint, 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. In a similar vein, interactional sociolinguists have aimed at understanding how speakers and listeners make use of specific linguistic devices to make inferences about communicative events in which they are involved (Gumperz 1982). For instance, they consider that social identities and relations are not only shaped by specific cultural and institutional arrangements, but endorsed and jointly negotiated through discourse and verbal interaction (Zimmerman 1998).

Non-verbal communication has long been a very fruitful domain of research for linguists, anthropologists and psychologists. Quite interestingly, though, it has undergone significant changes during the last couple of years, giving rise to intensive investigation and to a new field of research known as multimodality.

What makes this area of research new and original is a tendency to break away from a logocentric view on language and communication and to reach a better understanding of the specificities and complementarities between various semiotic modes (gestures, gazes, body movements, spatial displays, images, objects, voices, texts, etc.) associated with human behaviour. Multimodal discourse and interaction analysts originate from a variety of sub-domains of linguistics such conversation analysis (Goodwin 2000), mediated discourse analysis (Levine and Scollon 2004), social semiotics (Kress and Van Leeuwen 1996), functional linguistics (O'Halloran 2004), etc. These various disciplines have developed distinct approaches to discourse and interaction, but they also share some common assumptions about language and social life. In particular, they have aimed at elaborating thick descriptions of ordinary and professional human practices, not only including linguistic conducts, but integrating the wide range of semiotic modes participants may use to participate in social action.

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 language sciences. In many areas of educational research, discourse analytical methods have been applied as a way to explore multiple facets of educational practices. 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 (Macbeth 2003, Mehan 1979). 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 education research so as to account for educational practices that take place outside the specific school context. For instance, Collin and Valleala (2005) look at the senses in which everyday workplace interactions in the field of technology and social work can be considered manifestations of learning at work and the ways in which such activity could be supervised. In a different context, that of air traffic control, Koskela and Palukka (2011) apply the tools of conversation analysis and ethnomethodology to explore the ways in which trainers and trainees act and interact in training situations. Also noteworthy is Akkerman and Bakker's (2012) study of vocational training practices in the Netherlands. Their study investigates the actions and interactions taking place between school and work during apprenticeships, taking into account both the cognitive and identity-related challenges of student's boundary crossing. Similar perspectives and research methods have been implemented in our own investigations dedicated to the Swiss 'dual' apprenticeship system (de Saint-Georges and Filliettaz 2008, Filliettaz 2010a,b,c, 2011a,b, Filliettaz *et al.* 2010).

Training apprentices in a dual VET system: contrasting case studies

To illustrate the benefits of an interactional and multimodal 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 afore-mentioned research programme. In the following sections, we provide two contrasting case studies, 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 mechanic who has no official tutoring functions towards apprentices.

The participants belonging to these two work and training sites were 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 estab-lished between partners. By observing and analysing brief excerpts of audio-video recorded data documenting naturally occurring interactions between these apprentices and their trainers, we addressed the following questions, related to our general conceptual frame: 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?

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 here, they initiate a new task included in the maintenance procedure: the clean-ing and fine-tuning of the valves located at the top of the six cylinders compos-ing 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:

  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 gur-ney\
  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*)) [figure 1A]

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*)) [figure 1B]

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\

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 their back below the lorry and to use a sort of gurney to work in a comfort-
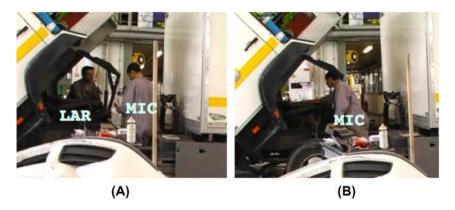

Figure 1.   Michael (MIC) and Larry (LAR) within the workplace. (A) Michael writes the firing order of the engine on a sheet of paper; (B) during Larry's absence, Michael observes the cylinders and valves composing the engine

able 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 (line 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', line 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?', line 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', line 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', line 4), takes note of his explanations (lines 10, 13), and provides correct answers to his questions (lines 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 not only produces 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 (line 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.

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, we refer to a second example, 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, while 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 (see figure 2).

1. SAM: ((*moves towards JEF*))
2.   Jeff/ 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*)) [figure 2A]
6. SAM: these are platinum spark plugs then/
7. JEF: ((*looks at SAM silently*)) [figure 2A]
8. SAM: yep I guess these must be platinum ones\
9. JEF: ((*looks at SAM silently*)) [figure 2A]
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*)) [figure 2B]
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 30,000 km maintenance and not a 90,000 km one\ at 30,000 km 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\

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 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 fac-
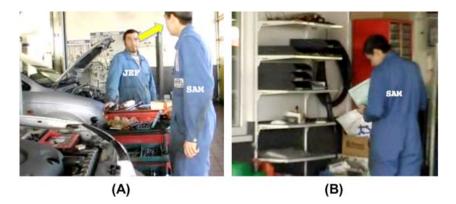

(A)   (B)

Figure 2.   Samuel (SAM) and Jeff (JEF) within the workplace. (A) Jeff looks at Samuel silently instead of responding to his question; (B) Samuel reads the documentation to find the answer to his question

ing 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 (lines 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 (line 3). Then, he does not provide verbal answers, but keeps on looking at the apprentice with anger (lines 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', line 10). After the apprentice comes back with the answer, Jeff blames Samuel for his lack of autonomy and for forgetting important information repeatedly (line 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', line 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 (lines 4, 6, 8). He also has to find out the answer on his own by referring to some documentation (line 11). Later, when coming back from the office, he accounts for the solution to his problem ('right I don't need to change them', line 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', line 15).

In summary, 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 re-framed 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.

Contextual fluidity as a resource for lifelong training

From what we 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 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.

Our findings presented here have important theoretical and practical implications. On a theoretical level, the fluidity of contextual arrangements within workplaces leads to a renewed perspective on the concept of 'context' in vocational education, a perspective that sees context not as a static or given reality, but as a local and situated construction. As summarised here by Duranti and Goodwin (1992: 5), interesting contributions emerged a couple of decades ago within the fields of microsociology and sociolinguistics, that bring a strong theoretical foundation to such claims:

> Such phenomena demonstrate the importance of, first, approaching context from the perspective of an actor actively operating in the world within which he or she finds him- or herself embedded; second, tying the analysis of context to the study of the indigenous activities that participants use to constitute the culturally and historically organized social world that they inhabit; and third, recognizing that participants are situated within multiple contexts which are capable of rapid and dynamic change as the events they are engaged in unfold.

Goffman's theory of 'framing', for instance, 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 James' and 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 affects the way we look at the relations between contexts and language in social interaction. As put by Gumperz (1982), among 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.

Applying a dynamic, interactional and multimodal perspective on 'context as contextualisation' does not only serve theoretical purposes in vocational education research, it may also illuminate practical issues that vocational trainers, professional associations and policymakers are currently being faced with. Coming back to the problem of drop out and change in 'dual' apprenticeship programmes, a dynamic perspective on 'contextual fluidity' and 'contextualisation' applied to vocational education practices elaborates on previous findings investigating the range of factors leading to attrition in apprenticeship pathways. More precisely, a fine-grained interaction analysis sheds light not so much on the 'causes', 'reasons' and 'factors' that may lead to incomplete training pathways or delayed transitions to employment, but on the processes by which these causes and factors are being enacted in practice.

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 programmes addressed to vocational trainers. As shown by the studies presented in this article, 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 (2001a) findings, 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 interaction analysis and apply their analytical skills to empirical material collected during our research programme. 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 fluidity' and 'contextualisation' does not solve the complex issue of attrition in apprenticeship programmes. However, from our own experience as researchers and as adult educators, it can make visible the sorts of difficulties faced by apprentices when joining the workplace, and it can also help trainers and experienced workers to become more reflexive about their role when it comes to assisting apprentices consistently to accomplish their transition into working life.

Notes

1. There is an obligation for companies who train apprentices to make sure that workplace supervisors undergo specific training programmes, but apprentices often have limited access to their workplace supervisors in comparison with the wide range of colleagues they interact with on a daily basis (Filliettaz 2011b).
2. This research programme was sponsored by the Swiss National Science Foundation (SNF) under references PP001-106603 and PP00P1-124650. It has benefited from the contributions of three other researchers: Prof. Ingrid de Saint-Georges, Dr Stefano Losa and Ms Barbara Duc.

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Appendix 1. 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
[figure 1A]	reference to the numbered illustration in the transcript