

Transnational Discourses of Knowledge and Learning in Professional Work: Examples from Computer Engineering

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Abstract Taking a Foucauldian framework as its point of departure, this paper discusses how transnational discourses of knowledge and learning operate in the profession of computer engineering and form a certain logic through which modes of being an engineer are regulated. Both the knowledge domain of computer engineering and its related labour market is heavily internationalised and characterised by a general focus on universalism and standardisation. Moreover, rapid shifts in technologies and institutional arrangements contribute to an embracement of more wide-ranging discourses related to lifelong learning and the enterprising self. Thus, dominant discourses of knowledge and learning within this profession reflect processes of globalisation and take a transnational character. The paper discusses how the discourses in play constitute mechanisms of governmentality that present certain expectations to professionals and shape their energies, efforts and desires in certain directions. In order to be influential, however, the discourses depend on individuals who take up the subject positions offered and enact them in locally relevant and partially creative ways. Thus, careful analyses of the discourses in specific knowledge communities, as well as of their interrelated subject positions, may enhance our understanding of the more epistemic dimensions of globalisation and how these come to influence the imaginations of individuals as ‘citizens of the world.’

Keywords Professional work · Learning · Discourses of knowledge · Governmentality · Cosmopolitanism

Introduction

The notion of cosmopolitanism is widely discussed in educational theory as, among other things, it concerns the fostering of citizens capable of participating in and taking responsibility for a world increasingly characterised by global interdependencies and risks.

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However, the current transitions in society do not only influence the conditions for education and citizenship, but they also affect working life in ways that both reflect general tendencies in a global society and take distinct forms within different domains of knowledge and expertise. Notions of becoming and being ‘citizens of the world’ are filtered through social practices in working life and these practices, thus, become decisive sites for the making of cosmopolitanism ‘from below.’

This paper contributes to this area of exploration by focussing on the constitutive role of transnational discourses of knowledge and learning in professional life. As knowledge-based groups responsible for core services in society, the professions are constituted by their specific ways of managing and engaging with knowledge. Historically, professionalism has been tightly linked to the state (Abbott 1988; Freidson 2001). Increasingly, however, the knowledge domains of professionals, as well as the production of services and collective identities, stretch beyond the nation state and into an extended globalised space (Brint 2001). This expansion is related to the construction, adoption and enactment of transnational discourses of knowledge.

One aspect of this is that knowledge itself is subjected to transformation. More abstract and symbolic modes of representation give rise to ‘global forms’ of knowledge, that is, forms that have a “capacity for decontextualization and recontextualization, abstractability and movement, across diverse social and cultural situations and spheres of life” (Collier and Ong 2005, p. 11). As also pointed out by Featherstone and Venn (2006, p. 2), processes of globalisation and digitalisation endorse the production and circulation of types of knowledge that “aspire to become a global standard.” Such forms of knowledge circulate quickly in information networks, and, on its way, it provides arenas for engagement as well as resources for community formation. In this way, “knowledge on its travels” (Strathern 2006) becomes a productive force that fuels globalisation. Another side of the coin is that ways of understanding and relating to knowledge are subjected to changes and are dispersed across social and institutional boundaries. According to Knorr Cetina (2002, 2007), the emergence of global knowledge societies is related to the spread of certain ‘epistementalities,’ that is, collective beliefs about the production and distribution of knowledge that operate across institutional boundaries and constitute organisational arrangements of roles and agencies. The ways in which people envision knowledge—its character, outreach and opportunities for engagement—become constitutive for social life.

To explore and discuss the ways in which these processes play out in the context of professional knowledge and learning, the paper utilises computer engineering as an illustrative case. As a domain of expertise that echoes core descriptions of the network society (Castells 1996), transnational movements may manifest themselves earlier in this domain than in many other professions. For instance, advancements in knowledge and technologies are closely related to innovation strategies in transnational companies. Practitioners in this field are often involved in activities that exceed the boundaries of local communities and cross traditional distinctions between professional work and economic markets (O’Riain 2000). Interestingly enough, these trends seem to be accompanied by an increasing concern for establishing computer engineering as a world-wide profession, grounded in a collective domain of knowledge and a profession-specific ethos for engineering work (see, for instance, Thompson and Edwards 2001). Thus, instead of seeing professionalism as an outdated way of organising work and responsibilities, computer engineering illustrates how expert groups of today attempt to reorganise themselves in line with the professional model to correspond to a more globalised world.

The paper focuses on how transnational discourses of knowledge and learning operate in this profession and address the professional self in certain ways. A Foucauldian

perspective is introduced to explore how discourses constitute mechanisms of governmentality that pose certain expectations on the subjects and contribute to shape their energies, efforts and desires in certain directions. At the same time, discourses are not determining specific actions but depend on individuals who take up the positions offered and enact them in locally relevant and partially creative ways. This implies processes of translation. It also means that there is space for diversity and for the empowerment of actors, provided that individuals know how to take advantage of opportunities. Following Delanty's (2006) more sociological approach, cosmopolitanism concerns a dynamic relation between the local and the global, and the cultural models through which the 'cosmopolitan imagination' is instantiated and articulated are important sites for examining transformation in society. From a Foucauldian perspective, the ways in which individuals enter the positions offered in discourse and turn them into resources for alternative modes of action and self-formation is an important area for further research if we are to understand the micro-processes of cosmopolitanism 'in the making.'

The paper is organised as follows. First, a Foucauldian perspective on knowledge and subjectivities is introduced and discussed in relation to governmentality. Then, the paper examines transnational discourses of knowledge and learning that operate in computer engineering and provide resources through which practitioners' knowledge practices, imaginations and modes of belonging are constituted. The discourse of lifelong learning is discussed as a more general mechanism of governmentality, as it represents a transnational idea that seems to be assumed by computer engineers as a tool for addressing and managing their opportunities for participation. Processes of self-formation and learning in professional work are, however, constituted in distinct ways relative to the knowledge domain in which they are embedded. Thus, the paper analyses transnational discourses of knowledge that constitute computer engineering as a practice and arena for self-formation. The implications for what it means to be a skilled participant in this knowledge world is then discussed. The last section of the paper sums up and relates the discussion to cultural notions of cosmopolitanism 'in the making.'

A Foucauldian Perspective on Knowledge and Subjectivities

A premise for the following discussion is the idea that the ways in which knowledge is organised and collectively dealt with in professional work form governing mechanisms that route actions and modes of perception in certain ways. In the theories of Michel Foucault, these processes are conceptualised as formative and mobilising relations of *power/knowledge*. Through this dual concept, Foucault reverses the idea that knowledge is power, and sees power as relational, productive and enabling energies that are always incorporated in knowledge. Knowledge and power circulate together and form coalitions of energies that allow thoughts and actions to come into being, while at the same time, guiding them in certain directions. Thus, he draws attention to the microphysics of power/knowledge relations that allow certain things to happen, to be legitimate and to appear as desirable:

In thinking of the mechanisms of power; I am thinking rather of its capillary form of existence, the point where power reaches into the very grain of individuals, touches their bodies and inserts itself into their actions and attitudes, their discourses, learning processes and everyday lives (Foucault 1980, p. 39).

Knowledge is understood in terms of active and dynamic representations that enable us to look at, understand and engage with the world in particular ways. In other words,

relations of power/knowledge operate in *discourses* that construct (aspects of) the world in certain ways and provide individuals with certain positions from which to act and make sense of the world. Discourses are, in this perspective, understood as cultural ways of thinking, talking about and understanding the world that shape actions. Their constitutive and productive role is stressed by Foucault (1972, p. 49) when he describes discourses as “practices that systematically form the objects of which they speak.”

In today’s working life, the knowledge discourses in play typically have both universal and differentiating implications, thus, they feed into the dynamics of globalisation processes. Following the line of Knorr Cetina (2006, p. 37), a critical and constitutive force of globalisation is related to the emergence of a certain ‘epistemality,’ consisting of “particular beliefs about, for example, the correct distribution of knowledge, the naturalness of access to it, the particular ways knowledge should be handled and inserted into personal and organizational life.” As she sees it, a major tendency in today’s society is related to the dispersal and embracement of a science-related epistemality within other areas of work. For instance, professional work across geographical and expertise-specific borders tend to incorporate practices of validating, documenting and legitimising knowledge, practices that, historically, have been associated with scientific work. At the same time, these processes take specific forms in specific areas, thus, also serving a differentiating function.

Discourses like those related to epistemification operate as governing mechanisms that cut across geographical and societal boundaries and also specify their internal relationship. This governmentality (Foucault 2001; Dean 2006) differs significantly from the forms of domination characteristic of previous times. Instead of controlling by restricting the actions of individuals, governmentality operates by the principle of recognising individuals’ capacities for freedom and agency and by making efforts to route this energy in specific ways. As Nikolas Rose (1999, p. 4) states, following the lines of Foucault, “To govern is to act upon action,” and entails efforts to “shape actions, processes and outcomes in desired directions.”

Three dimensions of governmentality may be focussed that interrelate in the construction of the self (Rose 1998). First, governmentality entails a *political dimension* that concerns how political authorities seek to act upon institutions and individuals to achieve social wealth, welfare and so forth. Second, governmentality comprises an *institutional dimension* that, for instance, operates through the organising of knowledge in specific professional domains. And third, governmentality involves the ways in which individuals relate to and act on themselves in terms of both subjugating and contesting the standards, norms and values embedded in the given system of knowledge—that is, the *technologies of the self*. These are, as Foucault (1994b, p. 225) describes them, technologies which “permit individuals to effect by their own means, or with the help of others, a certain number of operations on their bodies and souls, thoughts, conduct, and way of being, so as to transform themselves in order to attain a certain state of happiness, purity, wisdom, perfection, or immortality.” Technologies of the self are enacted by individuals, but the models for enactment derive from the cultural setting and are mediated through relations to other dimensions of governmentality. The technologies in play are, thus, simultaneously constraining and enabling. They have a potentially liberating and self-formative character, provided that the individual is sufficiently integrated into the actual circuits of power/knowledge relations so as to be not only constrained by these circuits, but empowered by them (Foucault 1994a; Tobias 2005).

Taking these perspectives as a point of departure, the paper proceeds by discussing how transnational discourses of knowledge and learning operate in the profession of computer engineering. First, powerful discourses of knowledge and learning are presented and

related to global markets of labour and technologies. Then, the possible consequences for practitioners are discussed as to how they are positioned and presented for certain ideals in the dual form of demands and opportunities. To illustrate how individuals take part in the discourses, some empirical examples are provided. These derive from data collected in the two Norwegian research projects ProLearn¹ and LiKE² in which early-career professionals were followed in their first years in working life by means of individual interviews, group interviews and learning logs.

The Discourse of Lifelong Learning

The discourse of lifelong learning cuts across institutional levels and seems to constitute a vital mechanism in governmentality in the last decade. In European countries, as well as in other areas of the world, engaging the population in learning is seen as a key to securing wealth, welfare and self-fulfilment. The contemporary notions of learning as ‘lifelong’ and ‘lifewide’ position learning as a key activity over the lifespan, as well as in life as a whole, private and leisure activities included. Further, the individual is placed at the heart of the debate and presented for ideals that simultaneously constitute demands and opportunities. A space of reasoning is created in which individuals are mobilised in particular ways and asked to embrace the notion of the continuous learner as a core narrative of identity construction.

These trends have made researchers in the Foucauldian tradition point to how notions of learning are linked to political and economical issues and serve as powerful means of governing, by producing new kinds of identities for individuals to take up, as well as knowledge and tools to support individuals in these efforts (Usher and Solomon 1999; Edwards 2004; Olssen 2006; Peters 2001; Tuschling and Engemann 2006). The mobilisation of individuals in directions that allows for both individual and societal growth is a core principle in governmentality, and learning is, in recent years, placed at the heart of such efforts. For instance, when putting forward the European agenda for lifelong learning, the Commission of the European Communities (2001, p. 20) related the objectives of lifelong learning to the promotion of “active citizenship, personal fulfilment, employability and social inclusion” (2001, p. 20) by giving emphasis to the learner within “formal, non-formal and informal learning experiences” (ibid., p. 9). This line of thinking implies a shift in focus from education and schooling to the self-managed activities of the learning subject. As described by Simons and Masschelein (2008), learning is ‘governmentalized’ and becomes a matter of both government and self-government. In this process, new subjectivities emerge within a set of learning-related discourses and practices that constitute a ‘learning apparatus.’ Learning is regarded as a form of capital that can be exchanged in (global) labour markets, and as something for which the subject is responsible and should be able to manage. For instance, in occupational life, the employee is addressed not only as someone who brings knowledge and expertise to work but, increasingly, also as someone capable of renewing this knowledge base on a continual basis (ibid.).

Like other theorists who have addressed the politics and discourse of lifelong learning from a Foucauldian perspective, Simons and Masschelein point to how this discourse addresses the subject and forms of citizenship in certain ways. What has been less often

¹ For more information, please see <http://www.pfi.uio.no/prolearn>.

² For more information, please see <http://www.pfi.uio.no/forskning/prosjekt/like>.

discussed, however, is the role of knowledge discourses in current mechanisms of subjectivity and community making. Social expectations and practices of learning are constituted in distinct ways relative to the enterprises and domains of knowledge in which they are embedded. While the general discourse of lifelong learning mobilises practitioners to engage in continuing learning, the knowledge discourses of a profession provide routes for specific kinds of engagement through the ways in which knowledge is mediated and generally dealt with. This, again, will give shape to the ‘epistemic trajectories’ (Lahn and Jensen 2007) through which practitioners negotiate their subjectivities, form their professional lives and engage in the world more broadly. Thus, profession-related discourses of knowledge may be seen as constitutive forces that mediate notions of citizenship and participation in the intersection of political–economical efforts and individuals’ agency.

Transnational Discourses of Knowledge in Computer Engineering

Professions are constituted through knowledge discourses. For instance, legitimate ways of producing and safeguarding knowledge, resources provided to support professional practice, and traditions and methods of advancement incorporate power/knowledge relations and serve to give communities an integrative power. In computer engineering, these processes are extensively internationalised in form and outreach. Three discourses of knowledge will be outlined, which all have a transnational character and which incorporate connections and relations of power/knowledge that makes simultaneous engagement in local and global spaces possible: the discourse of knowledge as produced in technological markets, the discourse of knowledge as information and the discourse of standardisation as a way of managing knowledge and risk.³

Knowledge as Produced in Technological Markets

A powerful discourse in the computer engineering profession concerns the notion of professional knowledge as tightly linked to advancements within global, technological markets. New computer programs, platforms and systems both premise the work of computer engineers and provide the foundation for the need of their expertise. Thus, to a large extent, the development of profession-specific knowledge pursues technological achievements. For the profession, this implies that the expert domain is characterised by dynamic interrelations towards other parts of the industrial sector, making market orientation and cooperation an important dimension in efforts of advancement. For instance, the Norwegian Society of Engineers (NITO), the largest professional body for engineers and technologists in Norway, exemplifies this through linking support services to recent inventions and allocates its courses to firms and arenas in the technological working field (Karseth and Nerland 2007).

In a Foucauldian perspective, discourses incorporate relations of power/knowledge that have a productive function upon the social world (Foucault 1972, 1980). For the professional subject, this discourse produces an attention towards technological achievements and makes the monitoring of such achievements a central task for the self. Staying updated on this scene becomes part of the ‘learning apparatus’ and a source for renewal of one’s competencies and employability.

³ For a more detailed presentation of discourses and knowledge practices in computer engineering, see, for instance, Nerland (2008), O’Riain (2000) and Mackenzie (2005).

Knowledge as Information, Distributed in Global Networks

A related discourse concerns the way knowledge is commonly understood in terms of information and regarded pertinent for distribution in global networks. This way of thinking serves to generate modes of knowledge distribution that goes beyond the boundaries of local workplaces. As a consequence, the epistemic resources take the form of information structures that are distributed in global networks, particularly by means of the Internet. Advancements in, e.g. software or programming codes are, for instance, made available on websites and accessed by engineers from different parts of the world. Since technologies are subject to rapid shifts and changes, such information structures are regarded as the most reliable source of updating. As one engineer says about programming in the computer script Java: “In Java, for example, all the information you need is on their homepage. If something new happens you will find it there.” Such information structures provide a medium of transaction that cuts across institutional spaces and simultaneously allows for local embeddedness and global outreach (Knorr Cetina 2006). Thus, when practising their work, the practitioners are linked with wider distributed communities. The relations of power/knowledge comprise close relations between technological advancements and dissemination on the global scene, and the way these processes are linked to information structures and market interests invite practitioners to engage in explorative activities that exceeds the boundaries of localised problem-solving.

The space for engagement comprises transnational arenas for participation and community-making also in a more concrete and ‘quasi-physical’ manner. One example is the organisation of knowledge dissemination on the website of the Sun Developer Network (<http://developers.sun.com/>). Here, the producer of new technologies, Sun Microsystems, offers access to information and knowledge advancements by providing online courses, conferences, catalogues of programming patterns that are regarded to be ‘best practices,’ as well as software that can be downloaded by developers worldwide. In the context of discourses and subject positions, it is interesting to note how ways of structuring knowledge are linked to social structures of participation and community alignment. By means of weblogs, forums and discussion groups, members of the network are invited to share their interests and to contribute to advancements in the field by testing technologies and sharing experiences related to problems and solutions. As Sun proclaims on one of their sub-sites for Java developers:

java.net provides a common area for interesting conversations and innovative development projects related to Java technology. By participating on java.net, members learn from each other, discover solutions to programming challenges, find new colleagues and mentors, and have more fun with Java technology (<http://developers.sun.com/learning/academic/>, accessed December 2008).

In this way, these networks also provide subject positions which are related to certain technologies. The professional self is addressed as a member of a technological community who is encouraged to commit himself/herself to certain technologies and invited to contribute to the collective knowledge practices of this community.

Standardisation as a Means to Managing Knowledge and Risk

A third constitutive force in this profession is related to a dominant discourse of standardisation as a way of managing knowledge and risk. This is reflected in the emphasis given to the standardisation of devices and the codification of procedures. Standards serve

as a precondition that allows the network structures described above to be efficient. Moreover, standardisation is closely interlinked with the technical rationality characteristic of the field. Informal standards come into view in the way engineers assess the work of colleagues and possible solutions. In spite of the multiplicity of possible connections and technical solutions, there are established principles for good engineering work. One engineer describes it in the following way:

I believe it is more generally accepted in this field [than in others] what a good solution looks like. If five code developers work individually on the same task they will probably all agree—or at least four of the five will agree—upon which solution is the better.

The enactment of this discourse in professional practice comes into view when engineers, as way of solving technical problems, turn to codified ‘best practices’ that are distributed in the information networks. The informants in our studies also adopt these patterns as models for their own programming work and are concerned to follow authoritative standards when writing programming codes. Thus, the power/knowledge relations that are mobilised in this discourse generate approaches to accumulating knowledge in professional work that are closely linked to standards that have a formal character. In contrast to many other arenas of everyday life, where individuals constantly engage with standards without paying any attention because they are so taken for granted in their social practices (Bowker and Star 2000), computer engineers are dealing with standards in a very explicit manner. This is, to a large extent, what their work is about: knowing the technological standards that are in play, knowing how they may or may not work together, and knowing how to perform different tasks within the different technological regimes. The commercial ways of advancing the knowledge domain by launching new versions of technologies serve to reinforce the importance of knowing and understanding the relevant standards. In this way, standards operate as a means of ‘soft regulation,’ and their origin in transnational bodies or companies contribute to globalisation processes (Higgins and Hallström 2007).

The effects of this discourse for the professional self are, however, not clear-cut. Standards open and close possibilities at the same time. As one engineer expresses it, there is a danger that you “get squeezed if the short-term interests of your employer makes you less attractive on the labour market,” for instance, if the technologies preferred by the employer become out of date. Thus, the practitioners’ ways of taking up the discourse and negotiating its meanings in local work settings will be significant for their professional course, as well as for their ways of contributing to wider circuits of global knowledge.

Positioning of the Subject

According to Foucault (1972, p. 122), the configuration of a field of knowledge “defines the possible position of speaking subjects.” Such positions incorporate prevailing knowledge relations in the given domain and provide individuals with the tools and access points from which to act and to make sense of the relevant practice. In computer engineering, as in other professions, the subject positions emerge from an assemblage of discourses and relations of power/knowledge.

Two related positions may be focussed that are linked to global dimensions in governmentality. First, rapid shifts in technologies and work structures contribute to individualise the responsibility for long-term competence development. Research has revealed

how this profession is generally characterised by high mobility and by an absence of set career paths (Davies and Mathieu 2005; Loogma et al. 2004). From a Foucauldian perspective, Grey (1994, p. 481) notes, on a general basis, that the “new project of self-management” opens for occupational careers to play a particular role in modern societies, since they offer a “relatively well-defined scenario within which individuals may develop, express and create themselves.” Moreover, as part of the project of the self, career constitutes “labour process discipline” in certain ways (ibid.). For computer engineers, however, the shifting demands and instability that characterise this working field may disrupt the presence of ‘well-defined scenarios’ and leave it to the individual to create and make sense of his or her own professional biography. Moreover, the global connections of technologies and people, as well as the common project organisation of work, implies that many engineers need to reposition themselves on a continual basis in relation to future projects and working tasks (O’Riain 2000). Thus, the responsibility for creating and maintaining a professional course is, by and large, allocated to the individual. As a result, the negotiation of self in computer engineering becomes tightly interlinked with career management, and attachment to the position as a lifelong learner seems to be a general strategy for handling this project of the self.

Second, the technological turnover generates demands for flexibility and capacities for handling change, at the same time as the ways of distributing knowledge by way of standards and materiality provides individual practitioners with resources for doing so. The subject positions offered place high value on staying technically equipped as a basis for being able to reorganise quickly. These positions are locally provided at the same time, as they emerge from transnational discourses linked to the emergence of global economies and labour markets. Thus, they advocate a variant of what Ong (2005, pp. 343–344) has called ‘technoentrepreneurial citizenship.’ As she describes the phenomena in the context of the Singaporean society: “Technoentrepreneurial values, that stress a mix of technical and entrepreneurial excellence in citizen-subjects, are now detached from culture and ethnicity, putting a premium on agile knowledge subjects who can help build a globally connected knowledge society.” Although Norwegian computer engineers are located in a different national context, they are also situated in and are contributors to a globalised knowledge economy. In this way, the assemblages of discourses, technologies, economy structures and work practices constitute spaces of governmentality through which individual practitioners are simultaneously embedded in local and transnational regimes of truths and ethics.

Dilemmas and Responsibilities Allocated to the Individual

The subject positions offered are, however, not clear-cut or ready to be enacted. They typically incorporate tensions and ambiguities that need to be sorted out and negotiated by individuals as part of the process of entering a position. At the same time, the mechanisms of governmentality tend to delegate such ambiguities to individuals and to address the self as the one responsible for sorting things out. A range of governmentality studies describe how the individual is positioned as the central ‘place’ where societal paradoxes and complex relations are expected to be managed (Fendler 1998; Miller 1993; Rose 1998; Simons and Masschelein 2008). The discourses outlined in this paper address the professional self in at least three interrelated ways, which all constitute a paradox or challenge for which the subject is regarded as responsible and calls for skills in reflexivity and self-management:

First, the professional needs to manage their agency in terms of attachment and resistance. At the same time as the subject is encouraged to commit to specific technologies and to stay updated on advancements in these technologies, he/she is also asked to attune his/her interests in learning to the requirements of current working tasks. The emphasis given to problem-solving and to making things work in engineering practice produces awareness for the specific demands in work situations. One effect is that many engineers avoid a total commitment to certain systems or technologies, as they will have to attune their interests in accordance with current tasks. As one engineer expressed, "It is probably the privileged engineers that are in position to state clear preferences and express a football-team-like feeling for systems." Thus, although relating their identities to technologies, the informants in our study resist the exclusive identities encouraged by, e.g. corporate-based networks in favour of a more pragmatic approach. Since a general expectation at work is to attend to the wants of, e.g. a customer, a rigid position is difficult to maintain without bringing oneself into a lot of frustrations. Thus, learning in working life is, to a great extent, mediated through the nature of the problems at hand and requires a flexible attitude towards different technologies.

Second, the professional is called upon to regulate and manage their participation in relation to time. As discussed above, monitoring and engaging oneself in technological advancements is regarded as an individual responsibility that the successful engineer is requested to handle. However, as the working days are dominated by sequences of instant problem-solving (O'Riain 2000; Nerland 2008), the engineers need to activate other techniques to keep up with the advancements more broadly and to care for their long-term career interests. A major strategy among our informants is related to monitoring advancements in the technological field. When the practitioners come in touch with new stuff as part of their problem-solving activities, they simultaneously employ techniques for staying informed on what's happening. One engineer describes it as follows:

It is extremely important to... have an idea of what's happening. So, you keep an eye on it, but you don't really go into it. Perhaps you try it out for ten minutes or so, just to see what it is, and then you put it aside. But then you know that the next time I face this kind of question I will have a closer look at it.

Hence, this kind of self-management involves directing one's attention towards possible future scenarios and to actively engage oneself in such scenarios. Moreover, the concern for keeping informed involves monitoring activities also when off work. Quite a few of our interviewees mention a number of websites that they visit regularly to get to know about new inventions. The engineers who have not yet decided how to specialise their competence express a concern for trying to stay as updated as possible on a broad basis, in order to 'keep all doors open.'

Third, the subject becomes responsible for positioning him/herself for learning-intensive tasks when it comes to the social organisation of work practices. One way of doing this is to express interest for participation in new projects that involve opportunities for learning about new technologies. Although such participation may have an optional character, especially in larger companies, our interviewees are eager to use these opportunities to develop their competence. Sometimes, the positioning involves groundwork and self-regulation in terms of calculation, as expressed by this engineer:

... you need to do some work behind the scenes, in order to get access to the right projects and to lead your career in the direction you would like it to take... and of course your competence development.

One dilemma in this regard is related to the project organisation of work, in which the practitioners need to be devoted to the collaborative work of a team and, at the same time, manage their individual position in current and future settings. Strategies of positioning oneself for access to future projects and tasks may also take the form of more formal learning efforts. The informants in our studies deliberately attend courses that are regarded to “look good on the CV,” even if the topic is not relevant for their current work. The courses may be provided by the employer or, increasingly common in this professional field, they may be linked to certifications issued by the larger technological companies. In this way, they incorporate mechanisms of globalisation and the learning activities become sites for the negotiation and enactment of transnational discourses of knowledge.

Concluding Remarks

The discussion in this paper illustrates how transnational discourses of knowledge and learning operate in professional work and produce certain subject positions for individuals to take up, as well as tools and techniques through which they may act on themselves as subjects. In Foucauldian terms, the discourses in play constitute mechanisms of governmentality that present certain expectations to professionals and shape their energies, efforts and desires in certain directions. In computer engineering, the discourses constitutive of the knowledge domain is highly transnational in character. Moreover, they are materialised in standards, technologies and competencies that are exchangeable in a global labour market. To understand the power of the discourses, we, thus, need to account for their material dimensions. What makes them effective is the transparency and the performativity that follows from processes of commodification, standardisation and ‘informationalisation’ of knowledge, and the distribution of such resources in global networks (Mackenzie 2005). As Knorr Cetina (2007, p. 365) states, objects of knowledge tend to be ‘doers’: “They have powers, produce effects; they may have their own internal environments, mould perception, and shape the course of an experiment.” Knowledge resources in computer engineering typically take ‘global forms’ (Collier and Ong 2005), which, through their capacities for decontextualisation and recontextualisation, create connection points and allow transnational knowledge discourses to diffuse into everyday work.

In order to be influential, however, the discourses depend on individuals who embrace the subject positions offered and enact them in creative and locally relevant ways. Thus, careful analyses of the discourses in specific knowledge communities, as well as of their interrelated subject positions, may enhance our understanding of the epistemic dimensions of globalisation and how they come to influence the lives of individuals. In this regard, there is a need for exploring the practice of self-technologies more closely in relation to how individuals create spaces for action and for the practice of ‘the care for the self’ (Foucault 1994a). Technologies of the self refer to assemblages of knowledge, instruments, devices, systems of judgement etc. which take ways of being human (or, in this case, being a professional) as their object. Thus, on the one hand, they exercise control and constitute the space of possible actions. On the other hand, they may have a deliberating and self-formative effect when enacted in reflexive and careful ways. A prerequisite for reflexive engagement is an attitude of critique (Infinito 2003; Drummond 2003). To make such a space available in a field characterised by transnational discourses that are linked to a global knowledge economy is, however, a challenge, as these discourses tend to be universalist in their ambitions.

The discussion above illustrates how computer engineers, drawing on dominant discourses in their profession, relate to a global world in their ways of understanding and dealing with their knowledge domain. They seem to understand themselves as participants in a transnational yet profession-specific social world, and perform their work in the intersection between local and global spaces and knowledge practices. In the context of cosmopolitanism, these ways of 'being in the world' have connection points to cultural cosmopolitanism, which Delanty (2006, p. 35) describes as "a plurality of cosmopolitan projects by which the global and the local are combined in diverse ways." He argues that cosmopolitanism in this sense would be exemplified in "transnational modes of belonging" (ibid.). To understand the conditions for cultural cosmopolitanism, he calls for more studies that focus on social practices and their structural conditions, and mentions, among other things, "theories of mobilities and forms of consumption, hybridities, networks and even modernity itself" (2006, p. 31) as relevant for this venture. Foucauldian perspectives may contribute to this field of research by revealing the interplay between discourses that are culturally and historically constituted and individuals' practices, imaginations and modes of belonging. At the same time, the Foucauldian approach has its strengths in illuminating the regulative forces of established ways of understanding the world, but it is less developed as a conceptual framework for analysing emergent perspectives and ideas that have more complex and network-based origins with unclear links to the past. The relationships between past and future, and between simultaneous, 'horizontal' development of ideas and more chronological forms, are, however, paradoxes that need recurrent consideration in social research. In this way, they also reflect ambiguities inherent to ideas of cosmopolitanism 'in the making.'

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