Chapter 8
Teacher Heutagogy in the Network Society: A Framework for Critical Reflection

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Following the advent of the network society, ontology and epistemology of learning have undergone significant changes (Borko, 2004; Fullan, 1993; Guskey & Huberman, 1995; Hodgson, McConnell, & Dirckinck-Holmfeld, 2012, pp. 292–293). While new information landscapes shape patterns of media consumption and production, their critical understanding has become a new mode of orientation and can even increasingly be counted as a civic skill. Consequently, educational institutions are expected to reflect contemporary social changes by introducing various ways of learning in and about information and communication technologies.

Acting as role models and facilitators, teachers are notable gatekeepers for entire realms of knowledge and action: for the most part, they decide which technologies and directions of social action are selected and promoted. On that basis, teachers are influential agents of social change (Fullan, 1993). However, traditional teaching competencies might not necessarily produce the desired results in networked settings. Therefore, the scholarly inquiry into the nature of networked teachers' new technological and pedagogical competencies has become increasingly relevant (Minocha, Schroeder, & Schneider, 2011; Shaikh & Khoja, 2011).

In mainstream research, teachers' relationships with technology have been traditionally discussed and developed within paradigms of instructional design or instructional systems design (see e.g., Banathy, 1991). In this context, the technosocial history of networked learning shows a constant evolution towards connectivity, flexibility, and openness. Learning Management Systems (LMS) have provided teachers with tools to share and manage course content. Virtual Learning Environments (VLE) have provided them with pedagogically tailored tools for performing social

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interaction. Customizable Personal Learning Environments (PLE) based on social media have placed individual learners into the focus and enabled them to manage own learning (Anderson, 2008). Following those fundamental conceptual and cultural developments, the role of the teacher is calling for a redefinition. Under the circumstances, teacher competencies in self-study and networking are becoming increasingly important. Therefore, this chapter focuses to individual teacher competencies in pursuit of sustainable support for professional development.

Relationships between teachers and information technologies have been described by various competing terms such as e-learning and technology-enhanced learning. In order to emphasize connections "between one learner and other learners; between learners and tutors; between a learning community and its learning resources" (Goodyear, Banks, Hodgson & McConnell, 2004, p. 1), this chapter is focused to the concept of networked learning. Teacher competencies in the network society have been extensively researched and debated. For instance, public discussions have asked whether teachers should be web-savvy or just web-aware (Lane, 2010) and to what extent teachers should be reachable via social media platforms (Preston, 2011). Educational institutions have been expected to bridge the digital divide by acting on differences that have turned out to be only partly generational and to adopt tools from informal learning environments (Warschauer, 2004). Following the 2005 *Alexandria Declaration* and the 2007 *UNESCO Paris Agenda*, recommendations and guidelines for teaching media and information literacy have been delivered worldwide (Grizzle & Wilson, 2011).

Following established definitions of media literacy, the UNESCO recommendations are based on three interrelated key competencies for the teachers' curriculum. Those competencies are: *knowledge and understanding* of media and information for democratic discourses and social participation, *evaluation* of media texts and information sources, and *production and use* of media and information (*ibid*: 22). In terms of information and communication technologies, it is declared that the pedagogic challenges involve "the integration of various technologies, tools, and e-content as part of whole class, group, and individual student activities to support didactic instruction" (UNESCO, 2008, p. 10). Teachers are required to develop critical thinking and extend it to their students using various media. Critical approach is extended from reception of digital content and web-mediated communication to content production, application of technological solutions, social presence, and online behavior.

This chapter elaborates a tentative framework for examining contemporary teachers' competence requirements with a focus on usage of information and communication technologies. Conceived within the theoretical framework of networked learning, its interest lies in exploring and understanding ways that networked technologies "can be incorporated into pedagogy and learning designs to support and mediate critical and productive learning" (Hodgson & McConnell, 2013). It cannot be denied that mastering technologies is nowadays seen as pivotal for professional development. Networked pedagogy pushes individuals towards autonomy crystallized in the concept of heutagogy, thus imposing increasing challenges for teachers as facilitators of self-directed learning processes.

The social structures of late modern society are significantly shaped by and organized around networks that build on digital technology and pervade all domains of social and economic life (van Dijk, 1999). Castells (1999) insists that pedagogy must be transformed to be apt to educate "creative, flexible, and autonomous individuals." Although teachers are often regarded as mere inducers of network interactions, they are also active agents in the network society. Instead of choosing between preselected resources characteristic for the era of printed textbooks, creation of virtual environments requires access, filtration, and autonomous choice of tools. In his recent work, van Dijk (2013, p. 6) interprets Michel de Certeau's *The Practice of Everyday Life* (1984), which proposes that people use tactics to negotiate the strategies that are arranged for them by institutions. This is exactly what teachers have to do with new technologies: consequently, they are every day confronted with a wide range of open questions that need to be solved locally.

Teaching and learning increasingly occur in mediated form and range from a wide variety of different forms of organization and interaction, such as private and public, co-operative and collaborative, or synchronous and asynchronous. This fact poses questions that need to be interrogated from the individual perspective, where teachers typically establish an expertise based on accumulated experience involving tacit knowledge supported and developed in reflective action (Nijhof & Streumer, 1994; Schön, 1984). Therefore, a shift from the ontology towards the epistemology of the teacher pedagogy is required, which implicates paying particular attention to the teachers' agency in the networked world far beyond the walls of the classroom.

Research on educational technology has often been criticized for the lack of theoretical grounding. Technology is often regarded as a context that effects classroom activities but does not belong to its core. In order to make deeper sense of such distinctions, this chapter looks at the relationships between learners, technologies, and the society within the theoretical framework of critical pedagogy. Arising from the tradition of Frankfurt School of Social Science, and more recent works by theorists such as Paolo Freire (1970/2005), Henry Giroux (1992) and Peter McLaren (McLaren & Jandrić, 2015), critical theory insists on active social role of networked learning and individual agency of each teacher and learner. However, unlike early Frankfurt School critiques of modernity focused to modes of production, networked learning is strongly focused at design and architecture of learning networks (Carvalho & Goodyear, 2014). This kind of design critique "relates the values embodied in technology to a social hegemony," but "what depends on a social force can be changed by another social force: technology is not destiny" (Feenberg, 2002, p. 64).

Following a similar line of argument, Edelson (2002, p. 119) notes that teaching and learning is at its heart a design endeavor. The practical process of applying a (critical) theory to construct a design may help educators to apply the results of educational research in a better and more innovative way. A design framework is needed as a generalized design solution describing the substantive design principles that could function as a coherent set of guidelines for a particular class of design challenge. The goal-oriented nature of design research ideally contributes to understanding of both theory and practice. On that basis, this chapter creates a design framework for critical reflection on teacher heutagogy in the network society.

From Teacher Roles to Critical Reflection

Changing competencies in networked teaching and learning are often conceptualized through changing pedagogic roles. As recent social and technological developments have resulted in various changes in pedagogic epistemes that contribute to the consolidation of constructivist and learner-centered models of learning (see Harasim, 2000), it has become clear that the traditional role of the teacher is being extended in various directions. In virtuality, roles taken up by teachers and learners are interrelated with their typical tasks. For instance, Downes (2010) identifies the following roles for the networked pedagogue: collector, curator, programmer, salesperson, convener, coordinator, designer, coach, agitator, facilitator, technical support, moderator, evaluator, demonstrator, mentor, connector, theorizer, and sharer. The networked teacher thus absorbs new dimensions which could be classified into five different roles: the designing or planning role, the instructive or cognitive role, the social role, the managerial role, and the technical role (Minocha et al., 2011; Shaikh & Khoja, 2011).

The technical role involves providing learners with technical support and, more importantly, the ability to navigate web environments and interconnect applications, build mash-ups, and manage systems of information. The managerial role means facilitating procedural, organizational, and administrative tasks to set up and run online activities. The social role, familiar from old non-mediated environments such as classrooms, is altered by information and communication technologies towards the challenge to facilitate creation and growth of online student communities and networked communication. The instructive role and/or the cognitive role may remain the same as in non-mediated classroom communication, and yet stress learning through interactive activities, critical reflection, problem-based learning, and versatile feedback enabled by online presence. Finally, the role of the designer or the planner is attached to technological and managerial dimensions of online teacher presence, as they set up social infrastructures by using different tools for information sharing and interaction.

However, the concept of changing roles does not directly contribute to understanding how pedagogy, content, and technology are mastered and brought in mutual relationships to social contexts. Models examining teacher competencies have mainly concentrated on the relationships between content, i.e., the actual subject matter that is to be learned and taught, pedagogy, understood as the process and practice or methods of teaching and learning, and teachers' technological knowledge (Mishra & Koehler, 2006). However, viewing any of these components in isolation from others is merely an analytic act that is difficult to pursue in practice. Instead, teacher roles exist in a state of dynamic transaction and are given meaning by individuals who apply, to use de Certeau's term, their "negotiation tactics." Teachers form personal and individual relationships with each component of the system, as understanding affordances of a particular technology requires direct engagement with that environment.

Within the field of andragogy, study of self-determined learning has been termed as heutagogy, after the Greek word *heautou* ("of oneself"), to designate learning

processes where the ultimate responsibility for learning is placed on the learner (Hase & Kenyon, 2000; for review of the concept see Blaschke, 2012). In mediated communication environments learners are given greater levels of agency, while learning is even further determined and directed by the learner. These developments are dialectically connected to digital literacy, as agency is directly aligned with the expectation that individuals must attain learning-to-learn competencies in order to succeed in the network society (Ashton & Newman, 2006).

Heutagogy typically refers to students or learners in general. However, it also applies to teachers oriented towards building connectivity and social rapport, facilitation of collaborative discovery and sharing of information, supporting content creation and contributing to aggregation of knowledge and information as well as content modification (McLoughlin, 2011; McLoughlin & Lee, 2010). More than ever, this invites networked pedagogical agents—teachers and students—to take ownership of the processes of learning. This embraces the idea of professional development of an expert (Bereiter & Scardamalia, 1993) which has been found on the basis for teachers' professional development but extends to all learners by emphasizing agents' ability to solve nonroutine problems in a given domain.

A key concept in heutagogy is double-loop learning of self-reflection (Argyris & Schön, 1996). In this experience-based model, the learner considers the problem and the resulting actions and outcomes, and simultaneously reflects upon the problem-solving processes and their influences to own beliefs and actions. Double-loop learning means more than just learning from feedback and taking actions to change one's behavior. It relates learning from one's experiences to reevaluation of one's goals and beliefs, and occurs when learners "question and test one's personal values and assumptions as being central to enhancing learning how to learn" (Argyris & Schön, 1978; Hase, 2009, pp. 45–46). The broader framework of reflective action thus implies that action can be reevaluated and changed by the means of critical self-reflection.

However, it is more intricate to ask: How critical self-reflection can be accomplished in order to arrive at relevant changes in action? Reevaluation of wider frames of action might be difficult, as everyday usage of information and communication technologies is strongly characterized by habitual usage (Venkatesh, Morris, Davis, & Davis, 2003). Blaschke (2012) points out that heutagogy involves a flexible curriculum, a learner-defined learning contract, and learner-directed questions. Heutagogical approaches can therefore be regarded as particularly applicable in continuing education of professionals. The idea of heutagogy similarly underscores the role of self-reflection as the key component of self-determined learning agency, which belongs to mainstream educational thought at least since Dewey (1916).

If teachers are going to impact educational settings, scope of their reflection needs to be extended beyond the tool and its technical usage. Some scholars (Brookfield, 2010) make a distinction between the terms "reflection" and "critical reflection." Criticality is a normative issue, as it is grounded in a set of values which determine what kind of learning and education is inherently most valuable. Within the framework of critical theory, reflection should be focused at uncovering and challenging the power dynamics and hegemonic assumptions that frame theory and

practice of networked teachers and learners. In this way, teacher heutagogy is dialectically interconnected with critical pedagogy.

Professional education that engages with and enlarges experience is based on Dewey (1916) principles of interlinking action and reflection as well as free interaction with the environment during the process of knowledge construction. As Peter McLaren convincingly argues (McLaren & Jandrić, 2015), the relationships between technologies, teaching, and learning require deep engagement with questions of social agency, voice, and democratic participation as developed within critical tradition by theorists such as Paolo Freire (1970/2005), Ivan Illich (1973) and Henry Giroux (1992) (and, by extension, Peter McLaren). Power structures underpinning daily implementation of specific norms, expectations, and behaviors related to information and communication technologies can be deconstructed with the help of critical reflection between networked professionals. Such deconstruction can foster teachers' empowerment in digital environments and contribute to changing organizational cultures that cannot be transformed merely by decision-making or reorganizing work, let alone by delivering information or exposing teachers to theory. Conceived within the framework of critical pedagogy, therefore, professional development of networked teachers can become a powerful agent of social change.

Pedagogical Usage of Technologies

In the field of networked learning, inquiry into pedagogical usage of technologies does not imply only questioning how teachers embrace the new tools, but also how they understand the antecedents and consequences of their adoption for teaching purposes. From constructivist perspective, all learning is, at least in its ideal state, a proactive process which results from personal experiences (Hase & Kenyon, 2007, p. 112). Teachers may facilitate learning processes by providing guidance and resources, while relinquishing ownership of the learning path and process to learners who negotiate what and how will be learned (Hase & Kenyon, 2000).

Individual agency in virtual environments involves continuous evaluation, adoption, and adjustment of different tools and technologies. Therefore, teachers construct relationships with various access channels to available tools. In information systems theory, technology acceptance models suggest that the main factors influencing user decision how and when to use a certain technology are perceived usefulness, ease of use and personal attitudes towards the system in question (Davis, 1989). Perceived usefulness is the degree to which people believe that using a particular system would enhance their job performance. It consists of factors such as influence of important people (the subjective norm), relevance of technology performance to one's job, and expected output quality provided by technology in question (Venkatesh & Bala, 2008). Perceived ease of use, in turn, marks the degree to which a person believes that using a system would be free of effort. It can be divided into components such as computer self-efficacy, computer

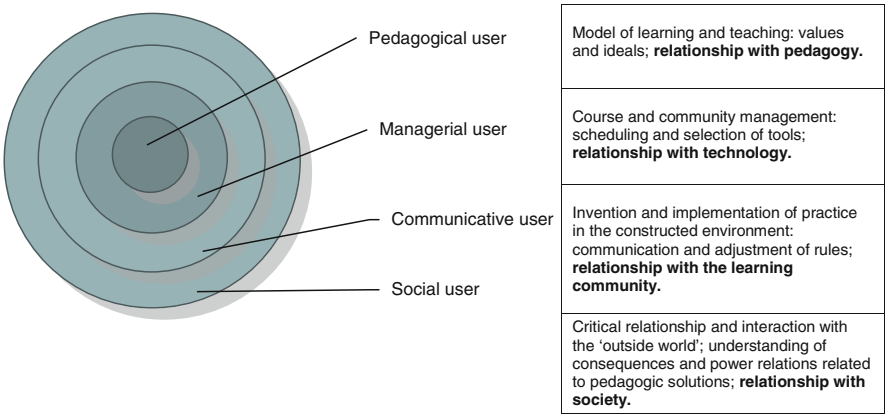

Fig. 8.1 Dimensions of pedagogical usage

anxiety, computer playfulness, and perceived enjoyment, which all mark qualities of the individual's relationship with a certain technology (*ibid*).

An essential prerequisite for technology adoption is thus the *technology relationship* that advances ways to enhance computer self-efficacy, which, again, encourages (more) creative intercourse with technology. Dealing with technology as a user is a matter filled with experiential knowledge. To advance heutagogy, users need to get opportunities for critical self-reflection in the fields of technological awareness, technology adoption and, after accepting a certain tool, for pedagogical and technical adjustment. Following this line of reasoning, it can be concluded that teacher heutagogy in relation to social media should consider teacher as pedagogical user, managerial user, communicative user, and social user (Fig. 8.1).

It may appear tautological to say that teachers are, first and foremost, *pedagogical users*. However, a wide range of studies (i.e., Anderson, 2008) have underscored the view that teaching with the help of information and communication technologies and social media should not be governed and conducted by technology-led ambitions; instead, the pedagogical goals should outweigh the technological ones. A pedagogical user has a pedagogical mission that can be partly or wholly realized in a networked environment. Additionally, there is always a number of good ways to realize any task. Pedagogical user should be able to evaluate a wide spectrum of opportunities and identify the best solutions for going online with students (or, indeed, for staying off-line). Pedagogy involves the conception of networked teaching and learning model which is almost inevitably constructive, and implies certain roles and positions for learners and teachers.

The *managerial user* entails an important dimension of considering affordances of a certain technology or a tool to fit pedagogical objectives. Above all, this role requires selection of tool(s) within various limitations. Affordance, coined by the perceptual psychologist James J. Gibson (1977), refers to actionable properties

between an actor and its environment. Their detection takes place as a consequence of interaction, in processes that assign values to objects in question, under dynamic conditions. Teachers can develop multiple ways of interaction with the same artifact, but it is crucial to carry out testing in order to detect various interpretations that the artifact may offer.

The *communicative user* comes into play when infrastructure has basically been constructed and a learning community should start its activities. Predominately, it is a matter of implementing pedagogical plan in a suitable communicative environment. Teachers should establish operational and ethical rules for various activities in order to mark boundaries between permissible and prohibited, appropriate and inappropriate, and desired and disdained. These rules cannot be entirely fixed in advance, as some will inevitably emerge as a result of learners' mutual interaction. The interaction, in turn, is interwoven with affordances in virtual environments.

When the teacher, as an agent in these four different user dimensions, is placed in the middle of inspection, he or she is primarily treated as a user combining content and pedagogy. When it comes to using technology, the core competencies form four areas of competence related to the usage, the practices, the conduct, the user, and the user environment. In combination, we finally arrive to the stratification of teacher competencies:

1. *Instrumental skills* are related to usage of computers and technology. They encompass basic skills such as text processing and browsing, and more advanced skills such as html mastering. Without instrumental skills, coherent and consequent activity in digital environments becomes impossible.
2. *Operational skills* represent competencies to take pedagogical advantage of available technologies. They are related to recognition and understanding of usage patterns in social media, and aim at fulfilling pedagogical goals by building upon instrumental skills. Operational skills include creating profiles in various public services, using different types of communication to achieve certain goals, and understanding consequences of online behavior.
3. *Strategic skills* are related to course planning, management, and understanding of networked communities from various perspectives. Teachers should know how to construct and lead virtual communities in different phases of its lifecycle, as well as how to get virtual communities working together. Strategic skills also include role and privacy management.
4. *Metacognitive skills* are related to self-regulation and web presence in networked environments. Teachers should be especially aware of own relationship with technology, time management, and lifelong learning and should foster experiences of self-efficacy and self-reflexivity. Personal progress can be supported by interaction and networking with other educators and professionals.
5. *Background skills* consist of a conglomerate of factors that either support or prevent evolution of the aforementioned skills. They include physical facilities, available hardware and software, teaching schedules, technical, educational, and emotional support for self-directed pedagogical practices, and intrapersonal communication to guide the "pedagogical imagination" in the community of

colleagues. These factors cannot directly be changed by educating an individual teacher on vocational courses but they need to be changed by educational policies and the teachers themselves within their communities on meso and macro levels.

6. *Critical skills* are necessary for creating connections between instrumental, operational, strategic, metacognitive, and background skills. They imply critical understanding of social and human consequences of various technologies, such as free- and open-source software, and skills required for making informed choices that reach beyond the level of immediate practice. Critical skills blend theory and practice, knowledge and values, and tradition and innovation, in the realm of critical praxis aimed at individual emancipation and social transformation.

From the perspective of technology acceptance, development of the above teacher competencies can be conceived at two main levels. At the level of everyday practice, they are aimed at finding appropriate solutions for networked teaching and learning. Within a wider time span, however, they are aimed at reaching a minimum of competence in different kinds of areas required for critical pedagogical agency in the age of the network. Some challenges pertinent to these new developments could be explored in teachers' continuing education, while others will inevitably stay in the "grey zone" of informal learning. In order to bring as many developments out in the open, the next section integrates the developed set of skills into a framework for professional reflection.

Overcoming Barriers, Identifying Tensions

Successful development and maintenance of critical learning in digital networks require a comprehensive set of knowledge and competencies rather than isolated skills. First and foremost, technology usage always builds on previous pedagogical expertise. Second, networked teachers should be prepared for regular developments in existing technologies and continuous flow of new hardware and applications. Foundation of lifelong learning in critical theory also requires teachers to continuously develop on moral and ethical basis. The ideological dimension that underlies all critical reflection discerns historically and socially sedimented values at work in the construction of knowledge, social relations, and practices. Therefore, to develop a relationship with technology suitable for advancing heutagogy, teachers need to be encouraged and invited to reflective dialogue.

In the area of professional development, it has been identified that practitioners gain deeper insight into their professional activities and improve their individual performance through methods based on mutual inquiry and self-reflection in self-managing teams. This approach is widely known as action learning (Revans, 1980), and its applications can be found in different kinds of organizational settings (Waddill, 2007)—including, but not limited to, the field of networked learning.

According to Revans (1980), professionals should be aware of gaps and inconsistencies in their knowledge. Consequently, they should be prepared to explore the

critical areas by asking suitable questions and accepting help from other people in similar positions. Critical consciousness of the core competencies and their absence or incompleteness opens up a path for networked learner's autonomy and self-determination. Teacher training should thus aspire for cognitive, emotional, and motivational dimensions when approaching technology from a pedagogical perspective. In this way, we are emphasizing teacher's personal relationship with digital technologies from pedagogical perspective supplemented with questions of affordance, community management, and critical reflection.

To a remarkable extent, adoption of technology is invested with personal and emotional significance, while relevant competencies can be fully acquired only through experiential learning. Successful adoption of any technology requires a continuous reflection of one's teaching activities and active effort towards solving perceived problems and developing updated survival strategies. Without reflection, teachers are likely to import own (sub)cultural norms and familiar problem solving practices into the classroom without making them explicit or testing their validity and utility.

Teachers should also become aware of the consequences of their choices and actions which inevitably hold economic, political, and cultural relevance for social transformation. As agents of social change, they should choose whether to support proprietary or open software, whether to endorse culture of copyright or culture of openness and sharing, whether to conform to the existing terms of use or to allow pragmatic exceptions. In this volume, contributions by Katarina Peović Vuković and Shane Ralston are particularly instrumental in addressing such choices. Critical reflection focuses not only on how to work more effectively and productively within the existing system. More importantly, it questions the very foundations and imperatives of current techno-social realities, thus assessing their morality and considering alternatives.

In the light of technology acceptance, typical areas of inquiry in teacher reflection can be analyzed at three different levels: instrumental, operational, and strategic (Table 8.1). Certainly, all knowledge areas are interrelated and interdependent. In order to make a strategic decision, for instance, an individual should be simultaneously informed by the instrumental level and the operational level. Furthermore, all levels of usage contain certain thresholds or barriers. The initial phase, as seen in workshops on web instruction for teachers, often involves discussing on the pros and cons of the "new" medium with regard to these barriers. Once critically contested, however, it can be discerned that not that much is completely new in the use of web technologies in teaching and learning.

The new models of teaching and learning are often built on constructivist and collaborative pedagogies enabled by network technologies (e.g., Borko, 2004). A number of learners are already acquainted with technologies from nonformal settings. As indicated almost half a century ago by Marshall McLuhan (1964), online software also derives its conceptual basis from the "old" media. Tools which have not acquired the official status of instructional technologies are tendentiously *framed* as something new in discourse. Rapid evolution of information and communication technologies prevents them from becoming transparent like their predecessors such as chalkboard and blackboard, overhead projector, and paper. Taming the new technology starts as soon as features that refer to something familiar and applicable are identified.

Table 8.1 Areas of reflective inquiry for action learning

Area of competency	Barrier	Potential tensions
Instrumental	Attitude: The relationship with technology, previous experience in computer-mediated communication	Is the user's previous experience characterized by positive or negative sentiments? What are the main anxieties and distortions? How do the tools conform to personal and professional values?
	Needs: Recognition of pedagogical needs and their equivalence to tools	Why should certain technology be used? Should technologies be used due to external pressure or personal preference? When not to use certain tools or technologies and how to abstain from them?
	Access: Availability of information about different technologies, new tools, etc.	How to access appropriate and versatile information? What kind of learning modes and learner types do they support? What is needed to operate with them?
Operational	Affordance: Technical and practical competence to harness digital tools for own purposes	Which technology and technological features support the goals best? Are the teacher's skills sufficient to resolve technical problems? How to find a tool corresponding to user's basic skills and social structure?
	Risks: Identification and prevention of harms and risks for learners	What are the most realistic risks for online activities in a given learning environment? Are they really risks or can they be (also) framed as possibilities? How to deal with real risks? How does the framing of something as "a risk" emphasize and conceal certain dimensions of action?
Strategic	Implementation: Persuasion of (new) users to use the tool chosen for pedagogical purposes	To what extent is/was the activity successful? How should it be altered? What sociocultural, political, and economic consequences follow?
	Adjustment: Findings through self-reflection on conducted work	How is a new tool embraced in learner community? How can its introduction and embracement be further supported? What are the particular and context-specific reasons for objections?
	Support: Context-specific background factors supporting usage of technologies in teaching and learning	Is there emotional and technical support in the community? What are the material facilities? Where could more support be found? Is all support sufficiently benefited from?

At the beginning of technology adoption process, a great extent of work is centered on attitudes and assumptions. As Mezirow (1991, p. 360) puts it, critical self-reflective learning can foster resistance to "technicist assumptions, to thoughtlessness, to conformity, to impermeable meaning perspectives, to fear of change, to ethnocentric and class bias, and to egocentric values." At early stages of technology adoption, teachers typically pose a number of questions that represent their uncertainty and uneasiness with the new medium, and those with less experience crave for reflecting their own relationship with technology and computers. Furthermore, many teachers feel that they have less power to make decisions affecting the

sociotechnical infrastructure of their classrooms than they really do, and reflection empowers them by building courage to make independent decisions.

Working on beliefs and prejudices related to technologies and technology-related pedagogical approaches that have not yet been fully legitimized in the community is necessary in order to pave the way for autonomous networked learning. New media provoke objection partly because of notable uncertainty and instability embodied in all information and communication technologies. Working on attitudes means redefinition of assumptions and active construction of an affective readiness to embrace new technologies for existing or new teaching purposes. Such work is not only individual. On the contrary, it is relevant for the whole community. Teachers must be given time and space to develop their attitudinal relationships with technology through the process of critical analysis and reflection that reaches far beyond the level of usage or convenience.

If there is no need for a certain task within the wider pedagogical context, there should, accordingly, be no need to introduce supporting technologies. However, needs can often be externally imposed and be related to societal demands as well as collegial rivalry in the professional community. Since the paradigm shift towards Web 2.0, pedagogical technology adoption has increasingly been detached from organizational policies (Anderson, 2008). In many contexts, teachers are basically free to opt for open-source tools free of charge instead of relying on organization-wide acquisition of licenses. However, it is often easier to go with the flow and use technologies on offer than implementing own solutions.

Construction and maintenance of online learning communities is associated with a wide variety of challenges. For instance, reliability of hardware and software as well as issues of privacy, copyright, and multitasking are often claimed to pose potential harms for teachers who feel responsible for protecting the networked learners' integrity and privacy. In reverse proportion to such protection, however, lies learner autonomy and various benefits gained from openness of education and teaching. By creating "a language of possibility," as aspired in critical pedagogy, potentials of information and communication technologies can be emphasized in an empowering manner that overshadows risks and disadvantages. Power of examples and peer collaboration has often proved efficient in sharing best practices and grass-root level developments. However, it is only through creating critical connections between the global, the local, the individual, and the general that networked learning can achieve an adequate balance between theory and practice.

In technology adoption research, facilitating conditions have been defined as the degree to which an individual believes that an organizational and technical infrastructure exist to support the use of the system (Venkatesh et al., 2003, p. 453). In this conceptualization, resources and connections that facilitate or hinder networked teaching in social media can be understood as both material and immaterial. Similar distinctions can be found at the generic level of networking, where Carvalho & Goodyear (2014, p. 417) talk about non-human nodes and human nodes, material and human connectivity. Neglecting finer theoretical distinctions, networked nodes and connections always include various variables affecting teaching and learning in environments determined by physical spaces, software and hardware, Internet connection, budget, and other factors.

Nowadays, however, many resources can be compensated using social media for pedagogical and professional purposes: by networking (to acquire newest information and seek for technical and professional support), collaborating (to exchange ideas and materials as well as to co-produce learning materials and elaborate practices), and using open software (to spare expenses). The described areas of inquiry might not present an exhaustive model. However, they do point at pivotal questions regarding adoption of social media: teachers should seek balance between their pedagogical aim, didactical applicability, and affordances of a particular tool.

Questions regarding adoption of social media intervene in personal and organizational relationships between networked teachers and learners and information and communication technologies. According to stratification of teacher competencies developed earlier in this section, teachers' interest in communicative features of social media is clustered around the following main themes: (1) whether to use virtuality in teaching; (2) which technology, platforms, tools, or services to use; (3) when to use technologies; (4) what are the consequences of using technologies; (5) how to ensure sufficient support for teachers and learners; (6) how to blend theory and practice in the realm of critical praxis. In sum, teachers are concerned with questions from access and utilization of different resources to critical emancipation and social transformation. Therefore, educational institutions should support all aspects of communicative processes that underpin technology adoption perspective.

In the realm of networked learning, heutagogy is a horizontal, non-hierarchical phenomenon. In the context of critical theory, all teachers are learners and all learners are teachers. Therefore, heutagogy developed in the context of networked teachers can easily be applied to their students—albeit often within very different contexts. Consequently, students should not be left aside in development of online structures, and the potentials for their engagement should be carefully examined. Establishing a *networked heutagogical partnership* amongst professionals and/or professionals and students as a basis for learning contract would engage both teachers and learners to advance ideas in operational and strategic skills. This would, in turn, advance exchange of experience contributing to networked teacher's and learner's heutagogy. Similar heutagogical partnerships could probably be developed in various other areas of teacher professional development. In the network society, however, such partnerships are always related to information and communication technologies and, by extension, to critical reflection on their complex relationships to networked teaching and learning.

Conclusion

In the field of networked learning, competence development is increasingly important because of enhanced self-regulation resulting from its decentralized nature. The main goal of this chapter is to identify conceptual tools to enhance development of networked teachers' agency in self-constructed virtual environments independent of technology and type of communication. The concepts of double-loop learning and self-reflection in action learning underscore the importance of developing teachers'

metacognitive resources to support agency. As postulated by various studies on networked learning and teaching, teachers are the key factor in embarking on new innovative projects and introducing new ways of learning. Vice versa, they may also hinder new ways of action through acceptance or refusal of certain pedagogical innovations.

Critical reflection is the key to acquiring learner autonomy—therefore, it is the central focus of heutagogy. Through critical reflection, networked learners can become aware of (mis)beliefs and (mis)conceptions that may set conscious and unconscious limits for efficacious action. Critical reflection may also unearth underlying power dimensions and assumptions. By exposing a multitude of relations around the self, critical reflection on technology usage can contribute to empowerment that helps learners to create own supportive networks. Although heutagogy is often conceptualized as a highly individualized activity, it requires vivid horizontal interaction: networked teachers need each other in order to undertake deliberate scrutiny. Reflection, however, builds on critical distance and thus requires a separate socio-techno-spatial space that is temporally and physically detached from everyday schedules and routines.

In the future, teachers are very unlikely to get more time for professional development than they have now. However, mobilizing a wide variety of network resources in line with the heutagogical perspective, they could acquire much needed spaces for learning and critical reflection. Involvement in online and off-line communities increases opportunities for access to information, provides emotional support, and enhances skills and knowledge required for critical participation in networked communication environments. Alongside fellow practitioners, teachers can form heutagogical relationships with a number of different communities: communities of students, parents, and virtual colleagues are valuable resources for critical, self-determined networked professional development.

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