The connective teacher: Network learning for a sustainable profession

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The connective teacher: Network learning for a sustainable profession

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Introduction

‘The times they are a-changing’. This holds particularly true for our current time. A time that has huge implications for education. For education has an open link to society. This society is subjected to incredible changes due to social, cultural and technological developments. We are a midst of a fourth industrial revolution, that is characterized by an intertwining of the physical and digital world. Into cyber–physical systems. Robots in health care, self-driving cars, the Internet of Things exemplifies this development (WEF, 2018). All these changes affects education and put the adaptive power of teachers to a test. Not only societal changes impact teachers, also the knowledge bases behind the profession expands. Teachers may use new insights in neurosciences, learning psychology, pedagogy and so on. The motto for the teaching profession is ‘lifelong learning’.

This learning will have a more collaborative focus. A teacher with a high individual professional autonomy lies behind us. Hargreaves and Fullan (2012, p. xi) typify this shift as follows: ‘To break down the walls of classroom isolation and convert teaching in a more collaborative and collegial profession.’

In this paper we describe a perspective on a ‘sustainable teacher’ who actively and collaboratively works and learn in an open connection to societal and scientific developments. This connective teacher is a professional, hence a solid knowledge base is key to his or her judgements and actions. These judgements and actions have

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a technical-rational dimension and a moral dimension. Doing things right, but also doing the right things.

In this paper we describe the professional capital that underlies the teaching profession. We focus on the social capital of teachers and how teachers acquire this in participating in various professional networks. This paper end with four statement that summarizes a vision on the connective teacher.

**Professional capital**

Hargraeves and Fullan (2012) coined the term *professional capital*. Professional capital consists of three components: human capital (referring to the individual), social capital (referring to the group), and decisional capital (referring to action). In a formula: $PC = f(HC, SC, DC)$.

The term *human capital* is the most well-known in this formula and refers to the knowledge, skills and attitudes of the individual teacher: the competencies underlying teachers’ actions and their justification. For teachers this is a rich and varied palette containing universal knowledge about psychology, pedagogy, subject matter, instructional design, but also insight in the family background of students, empathy and willingness to innovate. In short, human capital refers to all knowledge, skills and attitudes individual teachers’ bring to the stage in order to act as a professional.

*Social capital* arises amongst the relations between people. It consists of the resources available to individuals because they are a member of a group. The quantity and the quality of the interactions between group members determine the value of social capital. Quantity links to the amount of relationships and quality to shared norms, trust and reciprocity.

*Decisional capital* is at the core of professionality: decisions to be taken in complex situations based on careful judgments.

Human capital, social capital and decisional capital are not independent of each other, but reciprocally influence each other.

**Human capital: to acquire individual competencies**

There is a significant amount of research within various traditions about how teachers acquire individual competencies. All these traditions have one constant: the relation with practice is pivotal: both as area of application and as learning environment.
Cochran-Smith and Lytle (1999) distinguish knowledge for practice, knowledge in practice and knowledge of practice. The first one is about the application of general knowledge in practice. However, learning to apply separate knowledge components in practice is insufficient to adequately act in a classroom. The latter needs experience in practice. This experience leads to knowledge-in-practice: knowledge is a spin-off of practical action. This knowledge is often tacit. Knowledge of practice is anchored in practice and linked to more general knowledge. This type of knowledge is a result of reflection-on-action.

**Social capital in professional networks**

Social capital exists in a network of individuals and not in their cognitive structures. In an abstract formulation a network consists of nodes linked by lines. In a social network, the nodes are persons, and the lines the connections between those persons. Every individual is a member of many networks: for example family, friends, football club. Also teachers participate in networks, within and outside their schools. These are professional networks because ‘being a teacher’ is the reason why they are part of a particular network. In professional networks teachers’ individual talents (human capital) are purposively connected to each other.

Coburn and Russel (2008) distinguish four dimensions that influence the development of social capital in a teacher network.

Firstly, a network can be described by its structure: tie span and tie strength. Tie span may be limited to for example a school team, or wider for example to an international network of teachers. Tie strength is a function of social/emotional closeness and frequency of interaction. Strong ties facilitate the transfer of sensitive or complex knowledge and problem solving. By contrast weak ties are import to spread ideas, information and advice.

Trust is a second dimension of a network description. Trust consists of mutual understanding of roles in the network and alignment of expectations. It is a necessary condition to motivate people to discuss and share information and experiences.

Thirdly, the development of social capital within a network depends on the access to expertise. Participants in a network bring their human capital to the stage. Knowing, acknowledging and accessibility of this expertise influence the quality of the networks' social capital. Baker-Doyle and Yoon (2010) coin the term expertise
transparency and their research findings indicate that expertise in a network is not found and used naturally, it requires coordinated action.

Content of interaction is refers to the substance of the conversations of the network participants. The question is whether the exchange of information contributes to the professional learning of teachers. In this respect the depth of interaction is important. Little (1990) distinguishes the following degrees:

- Storytelling and scanning
- Aid and assistance
- Sharing
- Joint work

Important to note is that not all exchange of information is beneficial for example innovation purposes. If the ideas behind an innovation are not in accordance with the ideas in a network, this network can be a powerful instrument for resistance.

Learning within a network

The learning potential of a network depends on the degree of openness of a network. A closed network has a small tie span, and its participants are like-minded people who know each other well and share a lot. On the contrary, if the tie span of an open network is bigger, the variation in its participants’ background is greater and the interaction less intensive.

Both types of networks have their own learning potential. Learning in a closed network has an informal character and the learning is situated in the context of practice. The interactions consist of sharing practical knowledge and finding solutions for day-to-day problems. Also more confidential information is shared. A disadvantage is that a closed network provides little opportunity for new idea and expertise from outside. In a dynamic context this disadvantage comes into being (Wenger, 1998) The participants stay in their own ‘bubble’.

Does an open network have a higher learning potential? There is not a straightforward answer to this question. An open network offers more variety of expertise and sources and ideas are more numerous. However, an open network lacks the power of strong ties in which trust is obvious and collaborative learning is context-bound and focused on relevant problems and practical solutions.
**Learning between networks**

Learning between networks provides for a more integrated perspective on network learning. Participating in various networks is referred to with the term boundary crossing. Teachers ‘hop’ from one professional network to another. They may be a member of an mathematics department and of a special education team but also of an international teachers” network.

Engstrom’s (1987) cultural activity of expansive learning theory stresses the importance of boundary crossing for learning. If a network is not equipped for its task, looking outside the network is a must. The initial friction triggers a learning mode. In other words boundary crossing has a unique learning potential. For example an elementary school team wants to integrate IT in their science curriculum, but if they lack the expertise to do so. Then an appropriate action is to seek for advice and support in other networks.

In their review study Akkerman and Bakker (2011) provide for a conceptual framework of the learning potential of boundary crossing. Or as Wenger and colleagues stated that “radically new insights and developments often arise at the boundaries between communities” (Wenger, McDermott, Snyder, 2002, p.153). Four potential learning mechanisms can be identified that can take place through boundary crossing (Akkerman & Bakker, 2011):

1. **Identification** occurs as teachers are part of multiple practices which challenges their existing assumptions or practices. Teachers identify their own expertise and limitations. They recognize their strong and weak points.

2. **Coordination** evolves when procedures and rules are created in dialogue across practices in order to effectively cooperate and collaborate.

3. **Reflection** occurs when someone (re)considers this/her own practice due to taking into account the perspective of other practices. Teachers learn from reflecting on differences between practices. Reflection also occurs when teachers encourage others to reflect and reconsider their practices.

4. **Transformation** describes the effect of boundary crossing that leads to changes in practices or creation of new practices. Transformation starts with a confrontation as teachers experience a (shared) problem or have a question in their current practice. New knowledge or practices are co-created to be applied in practice.
These potential learning mechanisms can occur at different levels: the organizational, interpersonal and intrapersonal level (Akkerman & Bruining, 2016). Regardless of the level, interaction can lead to new perspectives on one’s practice. Organizational boundary crossing involves action and interaction between organizations, interpersonal crossing encompasses interaction between groups of people from different practices while at an intrapersonal level a single person crosses the boundaries of multiple practices. A Multilevel Boundary Crossing Framework was developed to describe these four learning mechanisms on the three levels, as can be seen in Table 1.

Table 1: Multilevel boundary crossing framework (Akkermans & Bruining, 2016)

<table>
<thead>
<tr>
<th>Learning mechanism</th>
<th>Institutional level</th>
<th>Interpersonal level</th>
<th>Intrapersonal level</th>
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<tbody>
<tr>
<td><strong>Identification</strong></td>
<td>Organizations come to (re)define their different and complementary nature.</td>
<td>People come to (re)define their different and complementary roles and tasks.</td>
<td>A person comes to define his or her simultaneous but distinctive participatory positions.</td>
</tr>
<tr>
<td><strong>Coordination</strong></td>
<td>Organizations seek means or procedures for institutional exchange and cooperation.</td>
<td>People seek means or procedures for exchange and cooperation.</td>
<td>A person seeks means or produces to distribute or align his or her participatory positions in multiple practices.</td>
</tr>
<tr>
<td><strong>Reflection</strong></td>
<td>Organizations come to value and take up another’s perspective to look at their own practice.</td>
<td>People come to value and take up another’s perspective.</td>
<td>A person comes to look differently to his own participatory position because of the other participatory position.</td>
</tr>
<tr>
<td><strong>Transformation</strong></td>
<td>Organizations face a shared problem space and starts to work collaboratively or merge institutionally</td>
<td>People face a shared problem space and starts to work collaboratively and may build group identity.</td>
<td>A person develops a hybridized position in which previously distinctive ways of thinking, doing, communication and feeling are integrated.</td>
</tr>
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</table>
Some empirical research has been conducted with this framework of boundary crossing. Bakx and colleagues (2016) for example examined boundary crossing by science teacher researchers in a PhD program. Their findings showed that personal characteristics such as communication skills and flexible switching and specific contextual factors like learning climates and supportive supervisors facilitated boundary crossing. Goos and Bennison (2017) also investigated factors that hinder or facilitate boundary crossing within the domain of mathematics education. Within the institute collaboration was enabled by trust, open-mindedness and the acknowledgment of a shared problem. Boundary crossing between institutes was more complex as boundary objects needed to be recontextualize and transformed which required a mutually beneficial exchange. The study of Cornelius and Stevenson (2019) focused specifically on each of the four learning mechanisms experienced by teachers in online collaboration. Their findings showed that all learning mechanisms occurred but were not experienced by all teachers. The authors suggest that learning does not appear sequentially from one learning mechanisms to the other, but more cyclical within each learning mechanism at the same time. More empirical research is needed to shed light on boundary crossing and learning. It must be taken into account though that not only individuals, but also objects are essential when boundary crossing.

Also the perspective is important. Looking at boundary crossing from an innovation perspective, we may say that identification and coordination fit into a stable context, reflection and transformation occur in dynamic, innovative, contexts. Innovation asks for new problem settings and solutions for which ‘the state of the art knowledge’ of the different networks is insufficient. The design process of new practices has to be facilitated and the sustainability of solutions warranted. But also the identity of each network and cooperation between networks needs attention.

**Artefacts in network learning**

This section focusses on the role of artefacts or object in network learning. The actor network theory of Bruno Latour (2005) perceives networks not only as a structure of relations between people but gives artefacts or objects an equal position in a network. Artefacts are not passive things, but they may initiate interactions. An educational computer program on mathematics may provoke a vivid discussion amongst
mathematic teachers. Boundary objects are objects that are recognizable across different sites but can have a different meaning in each site (Star & Griesemer, 1989). Or more specific, objects that are ‘both plastic enough to adapt to local needs and the constraints of the several parties employing them, yet robust enough to maintain a common identity across sites’ (Star & Griesemer, 1989, p. 393). Boundary objects play an important role in the theory of boundary crossing. They facilitate communication between networks and enable the coordination of joint activities. For example, in teacher education the scoring rubric for a thesis is an instrument to grade the thesis, for purposes of quality assurance it is an instrument to judge the level of a program against European standard.

*It comes down to choices: Decisional capital*

‘Making decisions in complex situations is what professionalism is all about’ (Hargreaves & Fullan, 2012, p.5). In classroom practice these decisions are taken in a split second are referred to as reflection–in–action (Schön, 1983). Especially in the eighties of the past century the amount of decisions teachers take was a popular research topic. Estimations vary from 40 to 200 decisions per hour. Teachers implement their plans and at the same time have a capacity for improvisation, because the interaction with student always asks for this flexibility. The right decision at the right moment is key to quality teaching. Good teachers do not only take decisions when ‘no one is looking’, but discuss their decisions with others and are open to feedback in order to take a collective responsibility for the quality of teaching.

Due to the growing importance of network learning, teachers need to develop a new form of decisional capital. Especially when innovation is at stake, teachers need their professional networks for new ideas and expertise. However, it is difficult to choose amongst the various networks, but it is also crucial to do so, because teacher time is limited and participating in productive networks is helpful, but in a less relevant network perhaps a waste of time.

Teacher also need to think about their role in a network: for example do they want to be the expert at the heart of a network or is participation in the periphery a good option? The competence to make good network choices is relevant for teachers in the 21th century.

A connective teacher: a vision on a sustainable profession

The term connective teacher refers to an interpretation of the teacher profession in which collaboration is essential. A teacher as a solo performer in the classroom is out-of-date. This does not imply that the relation between teachers and students is not important. On the contrary, it is the heart of the teacher profession. But, collaboration between teachers is vital to optimize this relationship. An effective team of teachers is a team that has confidence in their ability to realise collective ambitions.

In the relationship between teachers professionalism grows, and therefore focusing on social capital is an effective professional development strategy. Only concentrating on individual professional development seems not to be an appropriate strategy, because ‘if you concentrate your efforts on increasing individual talent, you will have a devil of a job producing greater social capital’ The reverse is not true high social capital does generate increased human capital (Hargreaves & Fullan, 2012, p.4).

Stable, relatively closed networks offer a basis of trust for learning in which context specific practical knowledge is created. However, in a vision on a sustainable professional closed networks cannot meet the challenges education faces, due to changes in society and technology. The teacher as a routine professional, who cares for quality education within a known framework, needs to be transformed to an innovation professional who looks for inspiration, knowledge and support outside familiar boxes. Developing a robust professional identity is vital first step to participate successfully in relevant professional networks in order to get new ideas and find, together with others, possible answers to new challenges. These ideas and answers need a translation to the local context.

For teachers who consider an innovation it is important to have interactions with teachers who have already experience with such an innovation. These interactions may be online, but online meetings impede an intensive, trustful exchange of ideas (Baker-Doyle, 2017). Innovation professionals could profit from a third space where they can find information about an innovation and can discuss it with other teachers and experts. Future Learning Labs may fulfill these functions. Moreover, Future Learning Labs provide for opportunities to see student and teachers at work with innovative approaches. It is a space where student–teachers, teachers, teacher
educators, researchers and others find a place to share and experiment with innovative ideas.

We round up this paper with four statements about the connective teacher:

1. Connective teachers are competent and passionate professionals who in collaboration with others realise the best education for their students. They believe that learning with all students is possible and value different talents of students.

2. Connective teachers show an attitude of inquiry. This attitude enables teachers to become lifelong learners in and of their practice and helps to develop situated knowledge. Teachers who embrace inquiry as stance draw on multiple insights and data sources to tackle relevant issues encountered in course of their pedagogical practice (cf. Cochran-Smith & Lytle, S., 2009).

3. Connective teachers are networkers who participate wilfully and deliberately in different professional networks and bring valuable insights back to their schools and classrooms. Connective teachers are innovative professionals who find a breeding ground for lifelong learning and innovation in physical and virtual networks.

4. Connective teachers are related to developments in society, especially its digital transformation, but they also value cultural diversity.

References


