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Leading Learning by networking (LELENET).

Theoretical perspectives for principals on how to build professional Learning networks

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Abstract

The general aim of the LELENET-project is to develop school leadership capacity to build and sustain professional learning networks (PLN) of teachers. The educational context is changing, which requires teachers to adapt their approaches. PLN have shown to provide the right conditions to foster teachers' learning and development that is needed to cope with these changes. This theoretical framework aims at describing what can be understood by PLN and what conditions are needed to support the sustainable implementation of PLN. School leaders have an essential role in the implementation and sustainability of PLN in schools. In particular, we identify essential competences for school leaders. Developing PLN will constitute a platform for starting to work on the challenges related to a changing context in schools. In that way the growth of bottom-up learning networks can help overcome individual difficulties with regard to a changing and increasingly diverse context and can support joint learning, co-creation of knowledge and professional development of teachers (Stoll, 2010).

Introduction

Professional learning networks (PLN) can help teachers overcome individual difficulties when faced with new expectations related to a changing and increasingly diverse context and can support collective learning in schools in this regard. It appears that collective learning within schools is still limited and that PLN between schools are not a common way of working in European schools. Research has shown that school leaders have an important influence on the extent in which PLN in schools are initiated and sustained (Vanblaere & Devos, 2016). Therefore, the aim of this paper is to provide a theoretical framework as a basis for developing school leadership capacity to build and sustain professional learning networks (PLN) of teachers.

Both in theory as in practice, PLN have different conceptualisations in different contexts, but there appears to be broad international consensus that it involves a group of people sharing and critically interrogating their practice in a continuous, reflective, collaborative and learning-oriented way (Mitchell & Sackney, 2011; Toole & Louis, 2002). The goal of their actions is to enhance their effectiveness as a diverse group of professionals to address challenges for the benefit of student learning, in a variety of contexts.

There is a growing body of evidence pointing to the essential role of a school leader in the core processes of learning and teaching in schools (Muijs et al., 2014). This is achieved by fostering adaptive strategies that answer the challenges of a changing and diverse context by means of a focused professional development school policy (Schelfhout, 2017). Leading teachers' learning and development requires specific competences of school leaders guiding and supporting these processes. Principals play a pivotal role in building capacity by promoting and supporting change processes and encouraging collaboration between staff. Research indicates that principals are working very hard, but so far spend little time in developing and supporting conditions that foster collaboration and joint learning in schools (Grissom, Loeb, & Master, 2013; Schleicher, 2012) through networking. Among other things, school leaders are often insufficiently trained to know how to implement and support PLN of teachers (Schleicher, 2012). The question is what knowledge and competences do school leaders need to organize and implement these practices of shared learning through networks.

Problem Statement

1. Changing context, increased diversity

Society is changing rapidly which brings new demands for education, school teams and teachers to constantly adapt their practices (Elchardus, Huyge, Kavadias, Siongers, & Vangoidsenhoven, 2009; Struyf, Adriaensens, & Verschueren, 2013). Changing society is characterised by globalisation and diversity which requires new teaching approaches (OECD, 2016). Teaching practice should align with the needs of a diverse population based on identity, social background, gender, ethnic differences, social class, educational needs, world visions, opinions and religions. Not only do teachers need appropriate pedagogic and didactic skills to cope with diversity within the classroom, they also need competences to communicate with a diverse set of parents and pupils. There is a growing diversity and complexity within the education systems and leadership competences are needed to cope with super diversity. A one size fits all approach to the leadership of learning and teaching is not appropriate for complex school environments. Instead teachers need to learn how to continually adapt their practices in a changing environment.

2. Professional Learning Networks (PLN) as a means to support educational change

Educational change depends on many interacting dimensions: school policy, motivation, structure, culture, assessment and school leaders are key to the success of these processes. Given the complexity within particular settings, change cannot be devolved to individual changes at the teacher level. The school organisation with stakeholders and partners needs to develop towards a learning

organisation that provides the essential conditions in which teachers can share and construct knowledge with colleagues and reflect upon their practices. PLN have been shown to provide the conditions for collective learning that supports educational change (Poortman et.al, 2018). The LELENET project has identified PLN as a means to support the learning and development of a diverse Education workforce, enabling teachers to address challenges of a diverse student population.

It appears that individual teachers are not sufficiently prepared in training to handle different educational challenges that derive from the changing, diverse context. Teachers are said to lack self-efficacy to handle diverse school populations, they feel isolated in the problems they face with diversity management and they complain of lack of support (Little, Leung, & Van Avermaet, 2013). Externally provided courses are often perceived to be too general and hard to transfer to teachers' practice. Furthermore, the content of off-site training does often not always coincide with the needs identified by teachers. A lot of energy is put into educational initiatives that do not necessarily align with an isolated approach of professionalization (Honig & Coburn, 2008). The need to develop the knowledge of teachers, particularly their disposition towards diversity management, is acknowledged as essential to the learning experience of students.

School leaders must ensure that learning and school/class development structures adapt to the needs of a diverse school population. Professional Learning Networks (PLN) have been shown to provide conditions that enable teachers to support transfer and alignment of practices to student need (Slegers, den Brok, Verbiest, Moolenaar, & Daly, 2013). In this theoretical framework our starting point is that teachers need to be able to adapt their practices and adjust their teaching approaches to deal with the impact of globalisation and rapid change. Learning can no longer be considered to be the responsibility of the individual teacher. To be successful in a changing and increasingly complex world, teachers need to work and learn together to take charge of change, finding the best ways to enhance young people's learning (Stoll, Bolam, McMahon, Wallace, & Thomas, 2006).

Research, for instance by Ballet and Kelchtermans (2009) within the Flemish context or by Van Veen, Zwart, and Meirink (2010) in the Dutch context, indicates that teacher professional development is still largely aimed at participating in rather traditional activities with transfer of knowledge as the aim of the process. Professional development is often reduced to the notion of 'refresher courses' in which the external, short and transfer character of professional development occupies centre stage. Professional development mainly involves attending activities that spend little attention to the translation of the content of these activities toward classroom practice or to new insights for

colleagues. The research by Ballet and Kelchtermans (2009) further indicates that professional development is clearly influenced by school policy, but that this happens in a rather isolated, separate set of activities from the other school policy domains.

The arguments and evidence presented on how to promote professional learning in ways that have positive impacts on outcomes for students challenge traditional ideas about professional development policy which most often has been shaped by making teachers attend study days (Muijs et al., 2014). The cycle of inquiry and knowledge-building has at its core the notion of teachers as adaptive professionals, alert to situations where previous routines are not working well and seeking different kinds of solutions (Timperley & Parr, 2010). This conceptualization of professionalism and development as one of adaptive expertise is gaining considerable attention within the research and professional community. As Muijs et al. (2014) argue this requires more than individual teachers understanding how they need to think and act differently.

“It also requires that schools become places for deliberate and systematic professional learning, where leaders are vigilant about the impact of school organization, leadership, and teaching on students’ engagement, learning, and well-being. Schools organized for learning in this way are usually referred to as having high ‘adaptive capacity’ (Staber & Sydow, 2002; p.248).

A PLN is one way in which school leaders and teachers can manage collaboratively the need to be responsive to change.

3. The important role of school leaders to initiate, support and sustain PLN

To reach this goal school leaders should create conditions for collaborative working because effective professional learning happens when teachers are supported to investigate, challenge, and extend their current views. School leaders will need the competencies to initiate, support and make PLN sustainable. There is consistent research evidence that membership of school networks provides opportunities for leadership development that can have an impact on individual leaders (Earl and Katz, 2007; Hadfield and Jopling, 2006; Hope and Reinelt, 2010). Teachers cannot meet new challenges in teaching and learning alone, so everyone who has a place in the chain of influence from policy to practice needs to ensure that the right conditions for professional learning are in place (Muijs et al., 2014).

School leaders can make an important difference by creating a focused professional development approach. It seems essential to integrate a professional development policy into a broader school policy, creating involvement from the teachers (Timperley & Parr, 2010) and changing their beliefs related to professional development. Given that PLN have shown to provide the conditions to foster

teacher learning within an integrated professional development perspective and that school leaders have an important role in the implementation and sustainability of PLN, we will elaborate this further in the subsequent paragraphs.

Professional Learning Networks (PLN) Theoretical framework

1. Conceptualization of professional learning networks (PLN)

The core idea of PLN is that teachers are encouraged to discuss, question and adjust their own professional practice. This can start from sharing ideas, insights, concrete and practice-oriented didactical approaches within an atmosphere of collective orientation on optimizing the learning processes of all pupils (Poortman & Brown, 2018). PLN are about encouraging teachers to learn from and with each other in a group, building a group identity, linked to a common teaching context, with shared goals and repertoire for interaction. In order to achieve the development of this collaborative culture school leaders should be aware of the need to intentionally create learning networks to assure the level of deep learning necessary for practitioners to cope with a diverse and ever changing context. Professional Learning Networks (PLN) are increasingly being promoted as mechanisms for knowledge creation that can make a difference for students. (Muijs et.al.,2014)

Networks bring together those with like-minded interests either internally within the school or beyond the school and are more than just opportunities to share good practice. The aim of professional learning networks can be to create knowledge in a specific context rather than replication or transfer. This becomes clear in the definition of networks resulting from the OECD Lisboa-conference in 2003:

Networks are purposeful social entities characterised by a commitment to quality, rigour, and a focus on outcomes. They are also an effective means of supporting innovation in times of change. In education, networks promote the dissemination of good practice, enhance the professional development of teachers, support capacity building in schools, mediate between centralised and decentralised structures, and assist in the process of re-structuring and re-culturing educational organisations and systems (OECD, 2003).

According to the OECD (2003), advantages from collaborative working in networks are: the reduction of isolation; collaborative professional development; joint solutions to shared problems; the exchange of practice and expertise; the facilitation of knowledge sharing and school improvement; and opportunities to incorporate external facilitation. Networks of teachers provide conditions for cultural and attitudinal change, embedding learning in the interactions, actions, and behaviour of a

teacher team. Networks also provide an opportunity to share leadership and responsibilities within and between schools (Earl & Katz, 2006).

However, PLN in the educational context have become a kind of ill-defined container concept similar to the related concept of professional learning community (Slegers et al., 2013). There are a number of concepts with similar features, but often they also differ on a number of essential aspects.

Concepts are for instance 'communities of practice' (Wenger, 1998) 'networked learning communities' (Katz & Earl, 2010), 'teacher communities' (Admiraal, Lockhorst, & van der Pol, 2012), 'lesson study' (Verhoef, Poortman, & Coenen, 2014) or 'teacher design teams' (Binkhorst, Handelzalts, Poortman, & Van Joolingen, 2015) or subject-specific learning communities (Schelfhout, 2017). Furthermore, PLN's are also related to more overarching concepts as for instance 'team learning' (Decuyper, Dochy, & Van den Bossche, 2010) which also can be applied to an educational context. The plasticity of the term 'network' means that it has been applied to a wide range of phenomena, both social and technological. In education, professional learning networks can imply a school internal network of teachers in a single school to school external networks of professionals all over the country (Chapman & Hadfield, 2009).

Although a wide array of network terminology and definitions of networks can be found in literature, there is no universal definition of a professional learning network. PLN may have different interpretations in different contexts, but there appears to be broad international consensus the concept involves a group of people sharing and critically interrogating their practice in an ongoing, reflective, collaborative, inclusive, learning-oriented, growth-promoting way, operating as a collective enterprise (Toole & Louis, 2002). Consequently we have adopted a working conceptualisation of *Professional learning network (PLN)* as a term that can be used for any group who engage in collaborative learning with others outside of their everyday community of practice. The goal of this learning is to improve teaching and learning in their school and/or school system more widely. Our goal is not to define one exclusive definition, because that might exclude important networks for learning used in different European contexts, but to identify important characteristics of networks that are a useful basis for training school leaders. The aim is to provide a guiding framework that can be used to understand essential factors of PLN in education the essential characteristics of PLN, as identified in the international research literature, will be discussed in the following paragraphs.

2. Essential Characteristics of Professional Learning Networks

Literature shows that professional learning networks share five key characteristics or features, which also appear to be intertwined, operating together (Hord, 1997). These characteristics are also identified by Stoll et al., (2006):

2.1 Shared values and vision

Having a shared vision and common goals has been found to be centrally important (Stoll et al, 2006). In the context of diversity management this would for example mean that teachers have a shared vision on how a diverse student population (e.g. different gender or race) can be addressed as both a strength and a challenge for teaching and learning in their classroom. Louis and colleagues (1995) suggest that a shared value base provides a framework for shared, collective, ethical decision making.

2.2 Collective responsibility

There is broad agreement in the literature that members of a PLN consistently take collective responsibility for student learning (Louis et al., 2010). It is assumed that such collective responsibility helps to sustain commitment, puts peer pressure and accountability for example to cope with diversity and a fair and ethical way.

2.3 Reflective professional inquiry

This includes a reflective dialogue (Louis et al., 2010) is important to mutually develop, share and reflect upon knowledge that is needed to cope with educational challenges such as diversity. Reflective professional inquiry refers to conversations about diverse educational issues or problems involving the application of new knowledge in a sustained manner (Louis et al., 2010), joint planning and curriculum development (Stoll et al., 2006), seeking new knowledge (Hord, 1997), tacit knowledge constantly converted into shared knowledge through interaction (Michael Fullan, 1991) and applying new ideas and information to problem solving and solutions addressing pupils' diverse needs (Hord, 1997).

2.4 Collaboration

This concerns staff involvement in developmental activities going beyond superficial exchanges of help, support, or assistance (Louis et al., 1995). Collaborative activity has shown to be an important precondition to achieved shared purposes, which is important in the context of diversity management. The development of new approaches to teaching would be considered unachievable without collaboration. Professional learning communities demand that teachers develop grown-up norms in a grown-up profession – where difference, debate and disagreement are viewed as the foundation stones of improvement (Hargreaves, 2006).

2.5 Promotion of both group and individual learning

All teachers are learners with their colleagues (Louis et al., 1995). Collective learning is also evident,

through collective knowledge creation (Louis, 1994), whereby the school learning network interacts, engages in serious dialogue and deliberates about information and data, interpreting it communally and distributing it among them. In this way, the aim is to promote learning with regard to diversity management both at the individual and the group level.

Bolam et.al. (2005) and Stoll et.al.(2006) identify further factors that can influence the success of PLN. These include:

- the development of a culture of mutual trust, respect and support among staff members and inclusive membership of the community;
- The community being school-wide extending beyond teachers and school leaders;
- and openness through networks and partnerships that look beyond the school for sources of learning and ideas.

In the subsequent paragraphs, these hindering or promoting factors to the development of PLN will be discussed in relation to the level of the network (activities and structure), the teacher and the school leader in their collective application of new ideas and approach to problem solving and solutions that address pupils needs (Hord, 1997).

3. Important factors for the success of PLN: the level of network activities and structure

3.1. The level of the learning activities

In a large scale innovation and research initiative in the UK, involving 137 networks (1,500 schools) between 2002 and 2006, Jackson and Temperley (2007) generated evidence about how and under what conditions networks can make a contribution to raising student achievement. This study identifies characteristics of the networked learning activities that have shown to be important to enhance collaborative learning within the network. According to Jackson and Temperley (2007), characteristics of successful networked learning activities can be arranged around focus, design and orientation. These learning activities are further elaborated below:

3.1.1 Focus: Activities within PLN need to be focused upon shared learning objectives. In the context of diversity management, the networked activities need to have a clear focus on what is the goal of the learning and the collaborative activities.

3.1.2 Design: Networked learning activities also need to exhibit the characteristics of the learning design (learning from another; learning with another) and meta-learning, they need to be purposefully designed and facilitated to change professional knowledge and practice in order to improve student learning. Within the design, opportunities for shared leadership need to be included.

3.1.3 Orientation: Successful networked learning activities need to be orientated towards changes in practice that ultimately improves pupils' learning and development. In the context of diversity management, the networked activities need to be oriented towards knowledge sharing and knowledge construction that supports the learning of a diverse student population with different backgrounds and different educational needs.

Successful learning activities have a clear focus on the learning of teachers with the aim of enhancing the learning of all pupils'. By aligning networked learning processes of teachers and pupils, and having shared leadership that promotes and supports that learning within the activities, there is evidence that networks succeed in their double-layered objective of fostering teacher learning and raising pupil achievement (Jackson & Temperley, 2006).

3.2 The level of the network structure

In a recent meta-analysis März et al. (2018) investigate how, when and under what conditions professional networks can contribute to sustainable educational reform. The systematic analysis resulted in an overview of innovation-specific, individual, structural, relational and leadership conditions, whereby the role of professional networks is included as part of the relational conditions. Relational conditions can reinforce but also weaken sustainable innovation. März et al. (2018), identifies the conditions of professional networks that contribute to reform sustainability as:

3.2.1 The degree of formality of the interaction: Formal as well as informal relations or structures are both needed. Formal interactions are important, especially in the beginning phase of an innovation trajectory, because they create the opportunities for interaction. Informal relations need to grow as they will lead to more lasting innovations (Coburn, Penuel & Geil, 2013).

3.2.2 The strength of the interactions: Networks with strong ties are characterized by frequent interactions and close proximity between teachers. Strong connections facilitate the transfer of complex, non-routine knowledge, the cooperation between teachers, collective problem solving and diffusion of innovations (Daly & Finnigan, 2010; Adams & Gaetane, 2011; Coburn et al., 2012). Weaker ties on the other hand are important for the diffusion of ideas, information and advice.

3.2.3 Depth of interaction: Teachers' social networks vary considerably in the depth of interaction (Coburn and Russell 2008). Interactions can be rather superficial (for example, when teachers

exchanges about how students are doing) or more profound (for example when they investigate the nature of student learning in a certain subject). According to Adams & Gaetane (2011) it is important that in the early phase of an innovation process, teachers have ample opportunities to talk about the practical aspects of the innovation. However, it is very important that the network aims at deeper interactions since they allow a more profound exchange of knowledge and ideas and norms about the innovation.

3.2.4 Availability of expertise: Access to expertise facilitates the sustainability of an innovation. In the professional learning network, it is also important to stimulate the development of expertise and of the exchange of the expertise between teachers (Coburn et al., 2013). In the context of diversity, this would point to the importance of experts participating in the PLN, sharing and discussing their expertise on diversity management, but also to the joint construction of expert knowledge.

3.2.5 Network Steering: Daly & Finnigan (2011) show that highly centralized network structures are effective for the diffusion of routine noncomplex knowledge and information such as schedules, but impede the effectiveness of groups engaged in complex tasks, such as high-level communication, intra-organizational knowledge and systemic change. They point to the importance of 'boundary spanners': well-connected individuals in the network who can connect to other actors.

3.2.6 Width of networks: It is important that teachers can cooperate with their colleagues in the school. However, also ties that transcend social and organizational boundaries are important for accessing information that may not be available in one's proximate environment. In other words, teachers must have opportunities to exchange ideas and cooperate in networks that transcend the own subject group or school (Coburn et. al., 2013).

The synergistic benefits of these six characteristics is likely to be the greatest in their convergence (März et al., 2018). März et al. (2018) also point to the importance of multi layered partnership: sustainable innovation asks for support on different levels: the policy-level (district, government), the school level and the level of the teachers. Wenger et al. (2011) recognise the need to understand the network landscape and identify five values promoted through networks. *Immediate* value refers to the importance of the interactions and activities of that community. The listening to others and sharing of stories can expand one's imagination or challenge a perspective. *Potential* value could be classified as retrospective value, mainly due to the awareness that knowledge growth may have been enhanced post-community experiences without the mindfulness. This may arise in gains in a personal, social, tangible, reputational or transformed ability to learn manner. *Applied* value can be viewed as using the knowledge learnt within a community by taking the initiative and adjusting it form use in varying environments. *Realized* value is concerned with the significance of the action

taken and its outcome on those it was intended for. Finally, *reframing* value is the notion that the amalgamation of learning through social interaction in a community lays the foundations for re-examining achievement and how it is structured. In the next paragraph, we will briefly discuss factors that might influence teachers' participation in PLN.

4. Important factors for the success of PLN: the teacher level

Given that membership of a PLN is often considered to be based on teachers' willingness to participate and their motivation to participate and cooperate with others in the PLN. From a development perspective, the starting point for PLN's is that they grow from the bottom up, without pressure or obligation from above (Hall & Hord, 2006). Consequently, PLN's in development-oriented systems is heavily dependent on teachers being self-motivated (Sutherland, 2004). Why are some teachers prepared to function in a PLN and why are others not prepared to do so? Their motivation to use these data can be very different.

4.1 Teachers' motivation to participate in a PLN

Self-determination theory (SDT) differs from other theories in that it emphasizes the quality of the individual's motivation rather than the quantity of motivation (Vansteenkiste, Lens, & Deci, 2006). Traditionally, motivation psychology makes a distinction between intrinsic and extrinsic motivation. Differences in the quality of motivation are related to the extent to which extrinsically motivated behaviour is autonomously regulated or regulated in a controlled manner. Behaviour regulation indicates why people do things. In the question why teachers are or are not motivated to participate in a PLN, according to teachers might be explained because teachers feel that they have to participate, for example because the school leaders expects them to do so (controlled regulation). It is also possible that teachers participate because they would feel embarrassed if they didn't (introjected regulation), because they can see the importance of PLN (identified) or because they like working together with colleagues in a PLN (autonomous). SDT states that autonomous motivation is always of a better quality than controlled motivation and will lead to perseverance even when things go wrong (Vansteenkiste, Lens, and Deci 2006).

4.2 Teachers' attitude towards PLN

The cognitive and affective components of teachers' attitude with regard to membership of PLN's are also important. An attitude is a complex combination of personal characteristics, standards, values, feelings, ideas and opinions, which determines how a person behaves in a particular situation (Krathwohl, Bloom, & Masia, 1971). The multi-component model of (Sanbonmatsu & Fazio, 1990) identifies two components: a cognitive component and an affective component. The cognitive component – applied to PLN's – is concerned with beliefs, models, preferences and other aspects,

which determine what a teacher thinks about PLN's. To what extent teachers believe that working within a PLN is a worthwhile activity that constitutes a valuable element of ongoing professional learning. The affective component is that part of the attitude in which teachers perceive emotions and make the choice whether they will engage in a PLN on the basis of what they feel. This component concerns to what extent a teacher feels comfortable in PLN and is enthusiastic about working within a PLN or experiences feelings of anxiety (Sanbonmatsu & Fazio, 1990).

However, conditions for creating well-functioning learning communities are not only situated on the micro level of team learning, but also on the intermediate level of the school and the macro level of communities of schools, education sectors and government, each with their own possible interventions and with specific interactions between these levels. School leaders have been identified as important intermediates between these levels and key actors in initiating, promoting and sustaining PLN. It is also important that teacher learning and knowledge sharing within PLN is institutional to prevent that an innovation such as a PLN disappears (Chapman & Hadfield, 2009; Leenheer, 2002; Verbiest & Vandenberghe, 2002).

The school leader holds a big responsibility to develop the a culture that fosters the development of a PLN. Supportive relationships within the school teams is an essential condition to encourage reflective professional inquiry and collaboration that are needed for learning and knowledge creation (Hall & Hord, 2006; Louis et al., 2010). Further, school leaders hold an important role as educator, since they will have to focus on learning on all levels. Finally, school leaders need to be committed to take a role as architect and organize time and space for teachers to collaborate. The next section will elaborate on these different roles of school leaders.

5. Important factors for the success of PLN: the level of the school leaders

It is difficult to see how a PLN could develop in a school without the active support of leadership at all levels. Leadership is therefore an important resource for PLNs, in terms of headteacher/principal commitment and shared leadership.

5.1 Leadership practices in the context of PLN

Research has shown that professional learning communities (Stoll, et al., 2006) and other forms of teacher teams (Vangrieken, Dochy, Raes & Kyndt, 2015) do not arise naturally. It seems that many teachers prefer working on an individual basis rather than working together. This is not an evident starting position for developing this kind of initiative. A successful development of different forms of learning networks will depend on the way school leaders embed these initiatives in their school policy and school structures (Stoll et al,

2006). Hargreaves (2006) argued that the expected presence of collegiality in PLN specifically invokes an institutional base and specific structural conditions, which emphasizes the organizational context the important role of the school leader. There is a need for deliberate support of this endeavour.

Shaping this kind of professional development policy cannot be done within a traditional top-down hierarchical view of leadership. To be able to reach this goal a specific kind of inclusive, cooperative leadership is expected from the Principals. Crucial to success is a strong focus on improving the core educational processes which take place in schools as a basis for constant school development (Hallinger, 2003) and the use of participatory processes to assure inclusive educational processes . Creating school structures in which different forms of learning communities are implemented and fostered by appropriate development conditions form an essential starting point (Schelfhout, 2017). As part of these learning communities a bottom-up school development, focusing on educational processes for pupils and staff will take place. Creating opportunities for the Principal to delegate tasks, share responsibility and induce more involvement of teachers in well-defined work groups is a required practice.

Different forms of teacher teams and deliberate encouragement for interaction could contribute to these goals (Schelfhout, 2017). Facilitators of teacher teams can become a kind of 'liaison officer' for the school leader, which will happen in two directions. First, these coaches of the desired process will gradually start to encourage a group of teachers to work on and improve certain aspects of their educational tasks in an informed way. To a high degree this can happen in a self-regulated way, because the group decides together which topics they will work on. A shared sense of purpose will be created by the coach, through which expectations are set and monitored. Process coaches do not only have encouraging tasks, but also coordinating, sometimes even steering tasks. Second, these coaches can become important contact persons for the school leaders. The school leaders for instance will be able:

a) to ask the process coaches for advice on specific (and growing) expertise in a certain field (focus of the teacher team)

- b) to monitor the progress made in these teacher teams based on results and data on these results as jointly developed in the teacher teams
- c) to take into account the results and conclusions represented by the data stemming from the different teacher teams: to discuss with the process coaches on new initiatives to be taken in the teacher teams in line with school policy and school development
- d) to coordinate the interaction between the different forms of teacher teams.

In this way we gradually can arrive at an elaboration of the concept of 'shared instructional leadership' as put forward by Marks and Printy (2003). In this concept different lines of thought related to school leadership converge: the concept of instructional leadership in which the school leader is focused on steering the primary educational processes as realised by the teachers (Hallinger, 2003). However the directive and top down elements of the model have been broadened and deepened with insights from the research on transformational leadership (Kenneth Leithwood & Jantzi, 2006) and shared leadership (e.g. Leithwood, Harris & Hopkins, 2008).

The concept of transformational leadership requires the school leader to create a vision that inspires the school staff. The process focuses on optimizing individual and collective processes of problem solving and learning. In this way a culture of professional collaboration is created in which teachers are encouraged toward continuing professional development and common problem solving (Leithwood & Duke, 1998). Therefore, transformational leadership is rather focused on capacity building for school development and less on direct coordination, control and supervision of the instructional processes (Verbiest, 2014).

Criticism of the concept of transformational leadership is that a transformational leaders do not always have an explicit focus on the primary processes of teaching and learning. Strong transformation oriented leaders therefore could hinder their teachers in their teaching tasks (Marks and Printy, 2003).

In shared leadership the school leader will recognise leadership activities in an interactive web of different leaders and followers in different situational constellations (Hargreaves, 2006). Marks and Printy (2003) integrated these different lines of research on school leadership into an overarching concept called 'shared instructional leadership'. Verbiest (2014) indicates that in this form of leadership 'the school leader on the one hand works

transformational: (s)he stimulates the involvement and development of teachers. On the other hand (s)he co-operates with teachers to optimize the primary process. (S)he is not the only one leading this primary process, but rather gives guidance to the teachers that lead the primary process' (p.4).

As discussed above, we assume that a successful development of PLN will depend on the way in which different conditions at the school and teacher level are met. In summary, within schools, there is the need for (1) shared goals and visions (2) shared leadership (3) culture of inquiry and (4) supportive relationships and trust. Further, we also suggest that teachers need to be motivated and have a positive attitude toward involvement in PLN, given the need for membership to be voluntary. School leaders can have a positive impact on both conditions for the success of a network at the teacher and school level.

Consequently an important question is what competences are needed for school leaders?

5.2 Three essential roles for school leaders

Based on research by Verbiest and Timmerman (2008, p. 21) on the roles of the school leader in the development of professional learning networks, a large number of interventions can be grouped into three roles: The role of 'culture developer' means disseminating and strengthening of certain values, views and standards in the service of a commonly supported professional learning culture. The role of 'educator' means fostering the intensity and quality of the individual and collective learning processes of team members, so that profound learning takes place. And the role of 'architect' means building structures, sources and systems in schools that enhance personal and interpersonal capacity development. In Table 1 we summarize school policy factors with a clear impact on the development of PLN as put forward by Stoll et al. (2006) and Stoll (2011), based on their review study. We organize the whole in the three categories as proposed by Verbiest and Timmerman (2008).

Table 1. The different roles of school leaders on creating PLN

The role of ‘culture developer’
<ul style="list-style-type: none">• Leaders have to be committed to create professional learning communities (Mulford and Silins, 2003).• Leaders will have to create a learning culture (M. Fullan, 1993).• Leaders will have to create a climate of trust and positive working relationships (Louis et al., 1995)
The role of ‘educator’
<ul style="list-style-type: none">• Leaders will have to focus on learning on all levels (Leithwood & Jantzi, 2006; Louis, et al., 1995)• Leaders will need to be a role model (Stoll et al., 1995).
The role of ‘architect’
<ul style="list-style-type: none">• To facilitate exchange between teachers, school needs to be organized to allow time for staff to meet and talk regularly (Louis et al., 1995; Stoll, Fink and Earl, 2003).• Opportunities for professional exchange need to be further facilitated by physical proximity (Dimmock & Walker, 2004).• To promote, sustain and extend PLN, schools will need external support in the forms of networking and other partnerships (Leithwood, Jantzi and Steinbach, 1998).

5.2.1 The school leader as culture developer

Fullan (1992) argued that any attempt to implement new practices, such as PLN, that neglects school culture is doomed to fail because school culture influences teachers’ readiness or resistance to change. Thus, an important condition for PLN is that there is a learning culture within the school. Fullan (1992) also suggests that a culture enhancing learning acknowledged different interests of all stakeholders, focuses on people rather than systems, makes people believe they can change their environment, makes time for learning, takes an holistic approach to problems, encourages open communication and believes in teamwork.

Research has also shown that learning requires a culture of trust and supportive relationships (Bryk & Schneider, 2002). Leaders will have to create a climate in which teachers trust each other, are not afraid to admit mistakes and ask for help and where positive working relationships exist (Louis et al., 1995)

Teachers need to be willing to question their assumptions and practices and to adapt their personal framework with long held norms and beliefs. For many years, traditional approaches to teaching and evaluation were used. Due to a changing context, there is the need for approaches that are fit to handle diversity. Diverse pupils have diverse needs, cultures, talents and approaches to learning. PLN can offer the right conditions in which teachers can learn together, build and exchange knowledge, ideas and advise if there is a safe learning culture (Fullan, 1992).

5.2.2 The role of educator

As stated above, leaders will have to focus on learning on all levels (Leithwood, Jantzi and Steinbach, 1999; Louis, et al., 1995). In the context of diversity management, both learning at the teacher level and at the pupil level are important. School leaders need to focus the network activities on enhancing teacher learning in order to broaden and deepen their professional knowledge, skills and attitudes. The final aim is enhancing the learning of all pupils, no matter their gender, race, culture, social background or educational needs. It is important that the school leader functions as a role model in this regard

5.2.3 The role of architect

Important preconditions to implement and sustain PLN are resources such as time, space and opportunity to cooperate. A school leader who wants to support PLN in school, also needs to provide the right organisational structures that allow teachers to meet and work together. To facilitate exchange between teachers, school organisation needs to allow time for staff to meet and talk regularly (Louis et al., 1995; Stoll, Fink and Earl, 2003).

Opportunities for professional exchange need to be facilitated by physical proximity (Dimmock & Walker, 2004).

As an architect, the school leader not only needs to construct the right structures within the school, but (s)he will also need to actively build bridges with external partnerships (Leithwood, Jantzi and Steinbach, 1998; Rosenholtz, 1989). Professional learning networks comprise ties within schools and across schools, which are both important from a learning perspective. School leaders cannot consider their schools as an island, they need to be responsive for external partners and networks to jointly learn and develop in the context of diversity management.

In summary, this theoretical framework points out that professional learning networks (PLN) may have shades of interpretation in different contexts, but there appears to be broad consensus that it suggests a group of people sharing and critically interrogating their practice in an ongoing, reflective, collaborative, inclusive, learning-oriented, growth-promoting way (C Mitchell & Sackney, 2000; Toole & Louis, 2002). This type of collaboration can facilitate inclusive practices. The theoretical framework identifies key characteristics of PLN (*shared values and vision, collective responsibility, reflective professional inquiry, collaboration, the promotion of group and individual learning, shared leadership*) that are essential to networks. Discussion of enhancing factors at the level of the network (*formality, strength, depth, availability expertise, strength, width*) learning activities (*focus, design, orientation*) and the teacher (*motivation, attitude*) are indicative of areas the knowledge and understanding required by leaders to ensure the success of PLN. Finally, three important roles are identified for the school leader to implement and sustain PLN, taking into account these important conditions at the different levels. These roles will be used as guiding principles for the development of the training modules for leaders.

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