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Development of analytical competencies and professional identities through school-based learning in Denmark

Bent B. Andresen¹

Abstract This article presents the main results of a case study on teachers' professional development in terms of competence and identity. The teachers involved in the study are allocated time by their schools to participate in professional "affinity group" meetings. During these meetings, the teachers gather and analyse school-based data about factors which persistently create and sustain challenges in effective student education (grade K-10). This process improves their understanding and undertaking of job-related tasks. The affinity group meetings also influence the teachers' professional identity. The research findings thus illustrate the fact that the analytical approach of affinity groups, based on the analysis of the difficulties in their daily job, provides good results in terms of competencies and identity perception. In general, as a result of meeting in affinity groups, adult learners develop professional competencies and identities which are considered crucial in rapidly changing schools characterised by an increased focus on, among other things, lifelong learning, social inclusion, school digitalisation, and information literacy. The research findings are thus relevant for ministries and school owners, teacher-trainers and supervisors, schools and other educational institutions, as well as teachers and their organisations worldwide.

Keywords adult learning; work-based learning; professional development; identity formation; analytical practice; professional affinity groups; inclusive schools

Résumé Développer les capacités d'analyse et les identités professionnelles à travers l'apprentissage en milieu scolaire au Danemark – Cet article présente les principaux résultats d'une étude de cas menée sur le développement professionnel des enseignants en termes de compétences et d'identité. Les établissements des enseignants impliqués dans l'étude leur accordent des plages de temps pour participer à des réunions de « groupes d'affinité professionnelle ». Les enseignants y collectent et analysent les données scolaires relatives aux facteurs qui créent et maintiennent des défis persistants à l'enseignement efficace des élèves (10^e classe). Cette initiative les aide à mieux cerner et à entreprendre des tâches relatives à leur travail. Ces réunions influencent en outre l'identité professionnelle des enseignants. Les résultats de l'étude illustrent ainsi le fait que l'approche analytique des groupes d'affinité, consistant à analyser les difficultés rencontrées dans leur quotidien professionnel, s'avère concluante en termes de compétences et de perception identitaire. Sous l'effet de ces réunions de groupes, les apprenants adultes développent globalement des compétences et identités professionnelles jugées décisives dans le contexte d'écoles en rapide évolution, de plus en plus influencées entre autres par l'apprentissage tout au long de la vie, l'inclusion sociale, la numérisation scolaire et la maîtrise de l'information. Les résultats de l'étude sont par conséquent exploitables dans le monde entier par les ministères et directeurs d'établissements, formateurs des formateurs et inspecteurs, écoles et autres établissements éducatifs, ainsi que par les enseignants et leurs organisations.

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Introduction

This article explores teachers' on-the-job learning, which not only involves the skills of the individual teacher but also the skills of the school system as a whole. Professional teacher development is not simply about improving the teacher's skills but also about improving student learning (Hattie 2013).

A traditional approach to helping teachers learn has been to develop the skills of the individual teacher to enable him/her to perform better in the classroom. However, results from research have shown that this type of individual professional teacher development – as it is generally conceived and practised – is less effective for students than similar group solutions (Fullan 2011). In fact, much of what is termed *professional development of teachers*, including courses, workshops, conferences and seminars, has little effect on student achievement (Cole 2004).

It is trivial to claim that individual professional teacher development improves achievement, because almost every form of individual teacher development will work in some way. If the criterion of success is “enhancing students' achievement”, 95 per cent of all individual teaching initiatives lead to positive effect sizes (Hattie 2012). The average effect size for these initiatives is 0.4 (Hattie 2009). However, although individual professional development fosters teacher learning (effect size 0.90) and changes teaching practice (effect size 0.60), these initiatives, in general, have considerably less influence on student learning (effect size 0.37 – below average for “enhancing achievement”).

In many countries, current programmes to develop teachers' competencies and professionalism include informal dialogue to improve teaching, collaborative research, and professional development networks (OECD 2009). However, although informal dialogue is a necessary part of professional teacher development, it is not enough that teachers talk to other teachers about teaching. Teachers also need to be part of professional development networks which aim to improve the experience of learning for students (O'Brien et al. 2008).

A development network is a group of interconnected teachers who meet on a regular basis for the purposes of joint educational problem solving and learning (Hunzicker 2010). The strength of this approach is that it links professional development to experienced teaching and learning problems. In particular, it allows teachers to identify, practise and gauge the effects of improved teaching and learning strategies (Cole 2004). When professional development shifts from a focus on individual in-service training delivered by central coaches

to a greater reliance on peer teacher collaboration, teachers are in a position to enhance their collective capacity and draw motivation from seeing the impact on their own work.

A job-embedded development network is a two-sided phenomenon; teachers absorb new information or ideas and they collaborate with other teachers. This constant collaboration enables teachers to claim ownership in shaping educational practice and helps to sustain improvement in the classroom, which is one of the main reasons for schools to practise professional teacher development. Existing research suggests that the collaborative approach to professional teacher development does in fact improve student learning (Vescio et al. 2008; Hattie 2015).

By adopting this approach, the world's most improved school systems continue to improve (Mourshed et al. 2010). The better-performing countries do not aim to have a few expert teachers as a result of individual development measures in the teaching profession but promote group solutions (Fullan 2011). This not only provides teachers with new knowledge and skills but also creates an ongoing community dialogue which considers educational challenges in the teachers' own classrooms and reflects these challenges to guide improved teaching practices (Vescio et al. 2008). Teachers can share and critically interrogate their practices in an ongoing, reflective, collaborative and growth-promoting way to mutually enhance both teacher and student learning (Stoll et al. 2006). In general, enhancing the collective capacity of teachers to create and pursue improved learning conditions for their students is one of the most successful methods of professional teacher development (Mourshed et al. 2010). To start this process, teachers need to find methods to discuss progression, including sharing and moderating. One of these methods incorporates the "data teams" model, in which a small team meets every two or three weeks and uses an explicit data-driven approach to collect and analyse data regarding student performance. Teachers' views are usually taken more seriously when they are based on facts which represent student achievement (Hattie 2009). The "data teams" model allows teachers to focus on what they actually mean by "challenge", "progress", and "evidence" regarding the anticipated and actual effects on their lessons (Hattie 2012, p. 66).

As such, data teams, development networks, professional learning communities, study groups, or other forms of collective responsibility in schools foster the development of a shared understanding among teachers regarding student progression, which is crucial for any school (Hattie 2012). This raises the question of how to construct educational settings in which teachers discuss data regarding challenges related to, among other things, teaching and

learning difficulties in inclusive public schools and how to create a plan to monitor what happens in the classroom.

Research objective

The overall objective of this study is to create a research basis for professional development. The term *development* refers to ongoing, sustained, work-based learning and identity-building. My research question was: “In which way can systematically collaborative analyses of job-related challenges foster professional development in terms of learning and identity?”

In particular, the research objective is to generate grounded theory¹ about whole-staff professional development driven from “inside” the workplace, as opposed to development based on typical “top-down” or “bottom-up” strategies (Andresen 2013). This study explores work-based learning in general and whole-school development in particular. It focuses on job-embedded learning in schools and the development of teachers’ professional identity based on a research-proven analytical approach called the Learning environment and Pedagogical analysis (*Læringsmiljø og Pædagogisk analyse*; LP) model (Nordahl 2005; Utdanningsdirektoratet 2006). Over the last seven years, approximately 40 per cent of Danish public schools (K-10)² have organised innovative work-based learning programmes for teachers (Sunnevåg 2014). Thus far, around 32,000 teachers have been introduced to a programme based on the LP model in order to continuously increase, among other things, their professional identity and analytical competencies.

In particular, this programme was launched to develop teachers’ competencies and professionalism with respect to inclusion. In 2001–2010, the number of students in public primary and lower secondary schools in Denmark who were excluded from normal classrooms because of learning or communication difficulties doubled (Egelund 2014), and, as a result, schools have been required to become increasingly inclusive. Consequently, many teachers have had to extend their professional expertise to teaching students with behavioural or learning difficulties. It has been shown that approximately 60 per cent of the teachers in secondary school need to improve their competencies in this area (OECD 2013).

¹ Grounded theory is a research method which begins with a research question and with a collection of qualitative data the analysis of which leads to the construction of a theory (Glaser and Strauss 1967).

² K-10 refers to education from kindergarten (preschool), up to year 10. In Denmark, children start their education in preschool at the age 5-6. At age 6–7, they progress to primary school (years 1–6) and at age 12–13 to lower secondary school (years 7 to 9 or 10). For more information on the Danish school system, see MoE 2010.

At the outset of the programme, teachers participate in an introductory team-based e-learning module co-ordinated by a university college. At the beginning of the practical phase, the participating teachers form affinity groups. On average, an affinity group comprises 5–6 teachers. The aim of these groups is to develop professional identities, competencies and practices in the area of inclusive teaching and learning enhancement. They analyse and act on information regarding classroom activities, learning content, ways of support and other key success factors on an ongoing basis. In general, they are responsible for:

1. defining and dividing actual educational difficulties (into workable elements);
2. obtaining and analysing information (about the workable elements);
3. considering and understanding (the workable elements); and
4. designing and testing improvements.

Initially, the analytical work is taught. In all of the participating schools, the adult learners were first invited to participate in a blended e-learning course. In this course, each affinity group was introduced to a research based approach to analytical work. This approach, described in detail by Thomas Nordahl (2007), does not provide specific methods of data collection and analysis or concrete pedagogical actions; instead, it leaves the affinity groups to specify suitable solutions to educational obstacles which they are able to manage.

As mentioned above, the reflections, collaborations and pedagogical analyses are conducted by the affinity groups themselves in order to create better learning environments and encourage professional development. The teacher's role as an adult learner within the affinity groups is closely related to a growing analytical practice, and it is therefore assumed that such affinity groups will foster transfer; in other words, that the teacher will apply what he/she has learned in his/her workplace.

When schools promote development from the inside, the influence on the teacher's professional identity is also expected to be high. One indication of this is increased self-efficacy regarding problematic situations in the learning environment. Another indication is that teachers characterise themselves as professionals who attempt to understand and not simply undertake pedagogical practice.

It is worth noting that the author of this article was not involved with these processes of institutional implementation and was not responsible for the professional development in the participating schools. As such, the research presented in this article is entirely independent.

Theoretical framework

The theoretical framework encompasses theory about the formation of identity in relation to job-embedded informed practice. The term *identity* has many different meanings in the research literature, and other terms are quite often used in its place (for example, “subjectivity”). However, rather than appealing to several different concepts and definitions of identity, this article uses one approach which draws on the “narrative turn” in identity research (Crossley 2000). According to this turn, the narratives of adult learners provide data about their professional identity. This does not deny the presence of something like a “core-self” which is conceptualised by various sorts of therapeutic professions. But the main reason for selecting a consistent narrative approach is that it permits research on the connection between work-based learning and the related formation of identity.

Professional identity is recognised as a phenomenon which both requires explanation and carries explanatory force, because it affects the outcome of job-embedded learning. For example, some teachers who consider themselves practitioners are not anxious to learn about educational theory. Moreover, they do not “need to know” the meaning of theoretical concepts, research findings or the application of these terms and results in their classrooms. In other words, they simply consider theories of learning, motivation and classroom management “nice to know”. Consequently, successful professional development should not only strive for learning, i.e. the improvement of competencies. To be truly effective, job-embedded learning needs to cultivate the adult learner’s identity.

The theoretical framework informing this paper also includes aspects indicating that a driving force in learning is the need to master situations in one’s personal and professional life (Pintrich and Schunk 1996). Adult learners often reveal their awareness, confidence and motivation through their choice of activities, since this choice indicates their need for self-actualisation and self-esteem (Madsen 1985). Self-actualisation includes personal motives such as enjoyment, interest, curiosity and eagerness to communicate (Pintrich and Schunk 1996).

Regarding self-esteem, the framework includes theory about perceived self-efficacy (Bandura 2006). In this context, the term *self-efficacy* refers to the learners’ perception of upcoming tasks and their judgment of their own capability to perform these tasks well. It is thus a matter of expectations. Some teachers tell rather pessimistic stories; for example, “Since I don’t really understand the challenges and they are difficult for me to handle, I don’t expect to do very well”. Yet, in other circumstances, teachers with higher self-efficacy say

quite the opposite; for example, “I expect to succeed, although the task is challenging”. Therefore, professional identity and self-efficacy may be improved when the teachers learn to systematically analyse and understand factors which persistently create and sustain challenges in their professional life.

Inspired by James Paul Gee (2000), this study exposes three aspects of professional identity. First, it highlights that professional identity is built in an institutional context. The adult learners work as teachers or hold similar positions. Being a teacher is thus an identity assigned by educational institutions (pre-service) and workplace institutions (in-service).

Currently, Danish primary and secondary school teachers do not require a master’s degree in education, i.e., analytical competencies at university level. Also, at schools, some teachers concentrate on planning and conducting classroom activities but neglect systematic analysis and evaluation (Mortimore et al. 2004).

Second, this article highlights that professional identity is built within a discursive context. For example, some teachers are referred to as “skilled” or “emphatic”. Such attributes cannot be acquired by the teacher alone (regardless of the teacher’s desire to be viewed in a particular way); instead, they depend on the “recognition” of those with whom the teacher interacts professionally. The source of professional identity is thus other people who “recognise” the teachers as either having or lacking a particular quality; for example, as being skilful, unskilful, charismatic or uncharismatic.

In current educational discourse, emphasis is placed on “inclusive” teachers. Following a time when many students were excluded from school communities because of learning or communication difficulties (EVA 2011a, 2011b), public schools in Denmark have been required, as mentioned earlier, to become increasingly inclusive. For this reason, current educational discourse prioritises the need for “inclusive” teachers. Some of the teachers experience this emphasis as a pressure.

Teachers are also requested to incorporate information and communication technology (ICT) into their classroom activities. Each student is encouraged to bring a tablet or laptop to use during lessons (Agency for Digitization 2013) and Denmark is the first country in the world to have a deliberate policy based on the “bring your own device” principle (Søby 2013)³. In addition, many pupils who do not meet the reading expectations for their age group are instructed to use digital speech synthesis⁴ to overcome reading barriers and allow them to

³ Since public schools cannot demand that students bring their own tablet or similar device into school, the 1:1 solution is achieved in two ways: either by providing all students with a digital device or by providing some students with a digital device and allowing others bring their own to use on the school network.

⁴ Digital speech synthesis converts text to speech/sound.

work at age-related expectations (Andresen 2007). Accordingly, educational discourse tends to emphasise “ICT-savvy” teachers. Again, some teachers experience this emphasis as a pressure.

Third, this article highlights that identity is related to “distinctive social practices that create and sustain group affiliation” (Gee 2000, p. 105). The groups share practices and goals associated with their dynamic affinity spaces. This notion refers to an analytical construct by Gee (2005) and is defined as semiotic working spaces with meaning-making interactions through words, sounds, gestures and images, which are considered an important form of social affiliation and places where effective learning occurs.

Such groups comprise employees who share an

allegiance to, access to, and participation in specific practices that provide each of the group’s members the wanted experience. The process, through which this power works, then, is participation or sharing. For members of an affinity group, their allegiance is primarily to a set of common endeavours and secondly to other people in terms of shared culture or traits (Gee 2000, p. 105).

Their affinity to these activities leads to the appropriation of an identity which is common to the shared practices.

This article presents results from research on work, learning and identity associated with professional affinity groups which deal with factors which persistently create and sustain challenges in public schools. These affinity groups share an interest in fostering student learning and well-being as well as furthering substantial organisational learning and the development of professional identities and practices (Andresen et al. 2009).

As mentioned above, these groups are established in order to promote professional development from the “inside”, i.e., neither down from the top nor up from the bottom. The groups have relatively high autonomy in the schools because the leadership is well distributed. After an introduction to pedagogical analysis, the schools allocate time to regular meetings where the affinity groups analyse the existing learning environment and decide which aspects they would like to modify. If time allows, they avoid “quick fixes” and explore information obtained in the learning environment and research-based interventions. In general, they aim to avoid premature solutions and strive to distinguish fact from opinion.

Since it forms a coherent sequence of on-the-job experiences, this type of adult learning is termed *coherent work-based learning*. According to conventional understanding, job-embedded learning is informal and learning in educational institutions is formal. Despite

being logical, this distinction has little practical implication when the research object is a mixture of job-related and provided learning opportunities (Clematide 2004).

Of course, some aspects of this type of mixed learning are more formal than others. Some rather formal aspects include the introductory phase – the team-based e-learning co-ordinated by a university college – and the subsequent application of the analytical approach. The more informal aspects include the teachers' shared efforts to identify and remove factors that create and sustain problematic situations in classrooms.

Apart from some external inspiration, the adult learners themselves organise and conduct the process systematically. They develop competency and identity based on their own experiences. When they verbalise their experiences, they are better able to understand their work.

It is important to channel this knowledge about professional development contents and strategies into current policy and practice, especially since, thus far, the potentials of teachers' professional development have not yet been fully realised. For example, the participants of in-service education seldom apply what they see, hear, and learn in their workplace. There is often very little transfer into practice (Brinkerhoff 2005).

In general, participants are more likely to apply what they have learned if the content is closely related to their work assignments (Wahlgren 2009). They are also more likely to use what they have learned when one-shot workshops are replaced with "job-embedded learning featuring teacher collaboration and use of coaches" (Duley 2011).

In the research literature, a frequently used term is *reflection on practice* (Schön 2001). Since the coherent work-based learning presented in this article designates a non-individualistic approach to professional development, it is not precisely the same as reflection on practice. However, in both paradigms, the learning requires perception and reflection.

Some researchers also apply terms such as *situated learning* and *communities of practice*. Situated learning is a spin-off of common practice in a given type of community, whereas coherent learning is a spin-off of efforts made by a community of practice to better understand what is occurring in this community.

Aside from this difference, the notion of a *common repertoire* can be adopted from theory about "situated learning". A community of practice usually constructs various resources, including common language and ways of speaking about practice. In addition, these resources often encompass common ways of doing things, e.g., shared routines before and after classes. Typically, they also include common artefacts such as agendas and assessment schemes (Wenger 2004, p. 101).

Coherent work-based learning can be targeted at new employees and trainees. As already mentioned, it can also occur in meetings during working hours or at any moment when experienced employees share their knowledge. It therefore contributes to employees' lifelong learning.

In addition, it contributes to the systematic exchange and processing of experiences in ways far beyond the exchange of "quick fixes". Furthermore, it contributes to the development of a common professional language. Under ideal conditions, it also fosters the employees' understanding and evaluation of their future possibilities in rapidly changing educational institutions (Clematide 2004).

Methodology

The findings of the research reported in this article are part of a larger research project⁵ which applied a qualitative case-oriented research design (Merriam 1998). The findings from the case study can be generalised to inform future professional development (Flyvbjerg 2010).

The case study is based on 622 focus group interviews among teachers who formed affinity groups within the Danish public school system (K-10). The purpose of these interviews was to explore changes in teachers' perspectives, competencies and identities in relation to adult learning. The interview themes thus encompassed experiences with systematically collaborative analyses of job-related challenges and teachers' professional development in terms of learning and identity.

In general, four teachers selected by the principals from each of the 566 participating schools were invited to be interviewed. The focus group interviews were conducted up to three times within three years at each participating school. Since there were relatively few academics at the schools,⁶ the interviews were mainly conducted by around 60 psychologists from advisory councils in Danish counties.

Based on the recordings of the conversations, the interviews were analysed in such a way that it was possible to generate a theory about the development of analytical competencies, professional identities and perceived self-efficacy. Accordingly, the coding using the transcripts was inspired by the principles of grounded theory (Glaser and Strauss 1967).

⁵ The larger research project, currently still in progress, includes nurseries, kindergartens, municipal primary and lower secondary schools, and technical colleges. It is led by the author of this article.

⁶ In Denmark, most teachers qualify by completing the 4-year BEd Programme for primary and lower secondary schools.

Results

Affinity groups are formed around a shared interest and common goal regarding research-informed and data-driven improvements of teaching and learning. Each group of approximately 5–6 teachers designates a facilitator, who prepares the agendas for group meetings and acts as a chairperson. The agendas encourage teachers to share information and participate in problem solving, which is expected to lead to professional teacher development.

On average, an affinity group meets every two to three weeks. At each meeting, the members of the group manage to identify and specify a small number of factors which persistently create and sustain problems in educating students effectively. For example, they might consider the gap between actual and predicted outcomes (a student's current knowledge, skills, well-being and behavioural standards).

After this, the members of the affinity group prioritise the problems considered. How urgent are they? How important are they relative to other challenges at the school? In particular, the group members consider why the problem is persistent; in other words, they consider the visible effects on students' learning or well-being.

Using a holistic approach, the affinity groups also identify the category of a problem – for example, classroom leadership, relationships, motivation, or values – and, in turn, they consider the environment in which the problem arises. In which particular situation is the problem recognised? When they identify and specify difficulties in their daily job, they use situational terms instead of behavioural (personal) terms. Although student behaviour may appear irrational, the teachers assume that such behaviour makes sense to the students in the situations considered.

Using a data-driven approach, the members of each affinity group collect data about the persistent problems they decide to process. These data are considered part of local evidence in terms of student well-being and learning outcome. Experiences of individual teachers and other informal data are supplemented with data from other sources, including classroom observations, communication with students and results of standardised tests. The latter data are typically provided by colleagues, reading consultants or behavioural advisors affiliated with the local school.

The affinity groups then analyse the various data and consider possible actions based on the results of their analyses. How could they act in order to improve a problematic situation? They also consider questions such as: Are the possible changes consistent with the

organisational realities? What are the intended consequences? Are there any unintended consequences and how can these be avoided?

Thereafter, the affinity groups decide how to take action. While monitoring the changes, they also consider whether further changes are necessary. Having evaluated the first cycle in the process, they are then ready to begin a new series of innovative steps which overcome socially constructed learning impairment.

The coding of the transcripts of the focus group interviews applied, among others, the code affinity group “Competence”. Our exemplary case study revealed that the teachers in general benefitted from an analytical approach, which they considered an improvement on previous practice.

Teachers have been experiencing difficulties in their daily job for years. However, any evaluation was often just a descriptive assessment without a proper analytical approach. Formerly, such descriptions were used to inform improvements in the following year. By contrast, analytical and collaborative work is carried out in order to make improvements on an ongoing basis. The affinity groups gather information and combine current and historical information to understand what changes specific classes or individual students may currently need.

By applying an analytical approach to educational difficulties, teachers improve their understanding of factors which continuously lead to challenges in the classroom. Since this analytical approach neither provides specific methods to address these challenges nor specific recommendations for future action, teachers are left to analyse and identify possible causes of these challenges in school life. In general, the teachers who participated in this case study seemed to feel that they benefitted from this kind of informed problem solving.

Some of the main reasons given by respondents in the interviews are shown in Display 1. All quotations in the display are from the transcripts of the focus group interviews.⁷

Display 1 Continuous work-based learning

“Personally, I think it has been very useful to learn to stop and investigate. Before, teachers were prone to present a solution with a 2-second warning. The analysis model has helped us to enter the study area, and the longer we move into it, the more qualified the output becomes. It gives me something every time I experience an educational problem.”

“We gain more experience, and we thus become better at solving problems.”

“You have to gather information, reflect and analyse before you can jump to action. It is important to hold onto it – otherwise it just becomes loose talk.”
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⁷ These and all subsequently provided transcripts were translated into English by the author for the purposes of this article.

<p>“When dealing with a problem, I am better at recognising what I can do something about. This means that my work approach becomes easier. I can still be a professional teacher and do something good for a particular child; even though I cannot change the fact that their parents make mistakes. I practise examining what underlies a problem and finding out what I can do about it.”</p>

To begin with, the affinity groups identify an educational problem which cannot be solved without knowledge of the real causes. They are not concerned with vague or loose ideas about factors which create and maintain problematic situations. Neither are they concerned with factors over which they have no control; for example, genetic factors or parents who are divorced, unemployed, ill, or suffer from an addiction. Instead, inspired by scholarly investigations, they systematically produce and process data about educational factors which they are able to change.

The coding of the transcripts of the focus group interviews also applied the code “Work identity” of the members of the affinity groups. By adopting a self-critical approach, they learn to thoroughly analyse their own impact on student learning. During the e-learning course, the members of each affinity group also learn to consider themselves as a changeable factor. In addition, they examine learning needs which are not met as a result of their own practices; for example, their teaching, their relation to the students, or their classroom management. This shift in focus affects their attainment as well as their professional identity.

Some of the main reasons are shown in Display 2. The analytical approach used by the teachers is called “LP”, which, as mentioned earlier, stands for “Learning environment and Pedagogical analysis” (Nordahl 2005; Utdanningsdirektoratet 2006).

Display 2 Work identity (all quotations are from the transcripts of the focus group interviews)

“The fact that we even got started on the LP affected our work identity.”
“I want to highlight the systemic foundation, where we turn from ‘the child has problems’ to ‘the child is in a problematic situation’. This will play into our identity.”
“We also need to look at ourselves as a sustaining factor.”
“For many years, co-operation has been about organising teaching: ‘You do this and you do that’, i.e., all the practical things. But we skated over the essential: To look at ourselves.”
“Looking at oneself in the way the LP suggests does something. It is a delicate process ... It is not about saying ‘you’re a bad teacher’; it is about considering this as a possibility.”

From the point of view of the teachers, their analytical practice affects their “work identity” and they express various personal reasons such as looking “at ourselves”.

Workplace learning and identity formation are thus mutually dependent. Learning fosters identity formation, and the formation of professional identity improves learning opportunities in the workplace. This type of connection between learning and identity is sometimes called *mutual causation*.

Moreover, teachers at many schools reported having made progress in their effort to develop a workplace with professional, emphatic and authentic employees. Some of the main reasons are shown in Display 3.

Display 3 Teacher professionalism and self-efficacy

“I experience that we have a purpose, a reason, and that we can argue to take action ... We can, for example, verify to the parents why we do what we do. We seem more authentic and professional to those we are responsible for.”
“In general, I think it’s great to have it as argument and evidence for our professional work.”
“The observations have been really exciting. They involve learning to observe properly, instead of looking at what you’re looking for.”
“The LP model helps to break patterns, so we don’t just act as we used to do. It is really important that we get to see things from different perspectives ... And I think it has helped to raise our professionalism.”
“After we got the LP, I got many partners who share the same knowledge and background. It’s important for me that I am not alone to support the class as a teacher, and my work therefore becomes much more professional and manageable.”
“The process has made it easier to share knowledge. You have a common language.”

The teachers develop their work identity and professional judgment and become motivated by their co-operation and knowledge sharing with their “partners”. They also benefit from “observations” in their workplace which are less biased and more thorough than before. Consequently, they report increased professionalism, self-efficacy and discursive identity.

Discussion

Over the last two decades in particular, teachers’ professional identity has emerged as a research area in its own right (Beijaard et al. 2004). A recent subgroup of this area is research on identity development when schools create safe and trusting opportunities for teachers to work collaboratively and debate, analyse and improve their influence on student learning and well-being with colleagues (Hattie 2015).

In general, teachers’ affinity includes a positive attitude towards their colleagues – including perceptions of similarity, trust and credibility – when sharing ideas, considering

common challenges and promoting professional development in terms of their expertise. Since an increasing number of students with special educational needs are included in Danish primary and secondary schools, this expertise now often also relates to various aspects of inclusion.

A driving force is the teachers' need to personally master challenging situations related to inclusion in their practice within schools. Their eagerness to master problematic situations in their workplace leads them to consider this practice from various perspectives and to communicate in more precise ways than previously.

These findings are in line with the research findings regarding the world's most improved school systems which keep improving (Mourshed et al. 2010). Moreover, the findings are in line with previous research on learning organisations. The team learning considered in this article has proven to be one of the most efficient ways of improving learning environments in schools (Senge et al. 2000).

The influence on student learning depends largely on how well the teachers evaluate and understand what happens in the classrooms in terms of effectively educating all students (Hattie 2012). The main purposes of the affinity groups are reflection, cooperation and teacher and student development. As noted earlier, these common efforts affect the participating teachers' common practices and their professional identity.

However, there is less impact on a teacher's individual practice. A school's comprehensive development effort creates time and space for group reflection and analysis through regular meetings where the investigative approach is the main item on the agenda; however, it does not create time in the teachers' busy timetables for them to reflect on this individually. In general, the teachers do not analyse challenging factors on their own and they do not spend much, if any, time on systematic, independent analyses of the situations in their classrooms (Andresen 2013).

Teachers meeting regularly over a significant period of time to explore some challenge of mutual interest related to student progression and well-being must be able to articulate outcomes in terms of data which indicate improved student learning. There needs to be some evidence that relates to this impact beyond the satisfaction of the teachers. This evidence has been provided by means of surveys in 2008, 2010, and 2012, which covered development in areas such as the inclusion efforts of the schools, the teachers' professional well-being and cooperation, and student achievement (Sunnevåg 2014).

The results of the analysis of the questionnaires used in the surveys suggest that learning environments have been improved in general and inclusion in particular (Nordahl et al. 2014).

From 2008 to 2010, the volume of special needs education in all public primary and lower secondary schools in Denmark increased from 10.9 to 12.0 per cent of the students, which corresponds to a relative increase of 10 per cent. In the same period, the number of students referred to special education decreased by 10.0 per cent in the schools with continuing affinity group work, which corresponds to a relative decrease of 8.6 per cent (Qvortrup 2011). The difference is thus 18.6 per cent in favour of a more inclusive learning environment and schools with continuing affinity group work. Besides the teachers' development of professional identity and reflection and an analysis of common challenges related to inclusion, there can, of course, be various other reasons for the creation of more inclusive learning environments.

The improvements found in 2008–2012 in schools with continuing affinity group work also include an increase in professional well-being of teachers and an enhancement of cooperation between teachers. The teachers reported positive results. Using a scale which had set the average value at 500 and the standard deviation at 100 in 2008, teacher well-being had increased to 525 and experienced teacher collaboration had increased to 573 by 2012 (Sunnevåg 2014). A measurable effect of professional teacher development on student achievement is certainly possible, but the size of this effect is relatively small. For example, the average grades in Danish, Mathematics and English were higher in 2010 than in 2008, but the improvements were negligible (Nordahl et al. 2011). The complexity of this influence requires more plausible explanations.

If the criterion of success is “enhancing achievement”, research evidence suggests that a long-term commitment to research-proven educational reform is required. In particular, schools which implemented comprehensive reform models for 5–8 years have shown effects above 0.4 in terms of student achievement (Borman et al. 2003). So far, there are no data available concerning this long-term effect.

However, research findings do illustrate that the collaborative approach of affinity groups – which are formed around a shared interest and based on the analysis of difficulties in teachers' daily professional lives – provide results in terms of increased inclusion rates. The strongest finding to emerge from this research was that school professionals feel that they are clearly influenced by a collaborative development of competencies and identity perception in an atmosphere of trust.

These findings are in line with other research results which suggest that teachers develop their professional practice and identity if they debate pedagogical issues and communicate on a regular basis (Larsson 2004). Teachers collaboration to evaluate their

impact on student learning and well-being has a higher effect size than most other approaches. In general, the effect size is 0.93, i.e., more than twice the average effect size (Hattie 2015).

Conclusion

This article presents results from a qualitative case study on teachers' job-embedded learning and identity associated with professional affinity groups. The results of this research are significant because they can be generalised to inform future professional development.

The research question was: "In which way can systematically collaborative analyses of job-related challenges foster professional development in terms of learning and identity?" This question has been answered with respect to the teachers' activities aimed at a reflective, analytical and informed professional practice. The research methods included focus group interviews with teachers who had implemented a systematically analytical practice.

The research question has also been addressed by applying notions from theories about professional identity and adult learning. The term *identity* has been recognised as a phenomenon which both requires explanation and carries explanatory force. It is closely connected to learning, since learning and identity are mutually dependent. The adult learners enter a positive circle: job-embedded learning – which enables them to improve their ability to identify and remove factors which persistently create and sustain challenges – has a positive effect on their professional identity, and, in turn, their professional identity has a positive effect on their learning opportunities in the workplace.

Around 40 per cent of Danish schools have implemented this type of job-embedded adult learning and development of professional identity. On average, 5–6 teachers in each affinity group within the public school system deal with challenges faced by teachers in effective student education. The collective responsibility is based on a common attitude of trust and engagement. The main phases of affinity group work include: identifying various educational factors which persistently create and sustain problematic situations, collecting data about such factors, analysing and comprehending these data, identifying some causes of the challenges, deciding which factor(s) to change, planning how to implement this change, taking action, and evaluating. Consequently, the teachers learn to apply a data-driven approach in which it is crucial to identify and obtain lacking data.

This case study provides evidence for the positive consequences of a collaborative approach to work-based learning and formation of professional identity. A particular synthesis

of work-based informal and formal learning termed *coherent work-based learning* has been recognised.

Teachers working together on a regular basis to evaluate their impact on student learning and well-being have a higher effect size than most other approaches. However, professional discussions and collaboration must be conducted in an atmosphere of trust. Accordingly, it is important to create safe and trusting affinity fora for teachers to share ideas, to make mistakes, to learn from mistakes, and to promote professional development fostering their expertise.

This case study generates the following “grounded” theory:

When affiliate groups of teachers systematically increase their understanding of factors which create and sustain challenges in their workplaces, they improve their own abilities, including analytical competencies, professional identity and self-efficacy. In general, the adult learners are able to act on their analysis and thereby implement important and necessary changes in their workplaces.

The teachers themselves believe that a systematic analytical practice forms their professional identity, i.e., their thoughts and intentions regarding their professional life. In particular, they believe it increases their professional self-efficacy. This, in turn, empowers them to carry out their work. Such a practice can help them to both be and work like professionals.

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