**Professional organizations in change**

– consequences for innovative behavior and wellbeing in the Danish health and education sector

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**Abstract**

Professionals in both the Danish health and the education sector have experienced comprehensive political reforms, increasing performance pressure and organizational change. Both sectors are characterized by organizations in which knowledge is important. This article sets focus on the dynamics of professional work organizations and investigates how the employees experience change in work and to which degree they are involved directly or indirectly in the change processes. It further investigates the influence of autonomy, discretion and learning in work practices. Finally the effect of change, involvement, autonomy and problem solving on innovative behavior and on well-being among the employees are examined. The empirical foundation for this analysis is from the Danish Meadow survey <http://www.meadow-project.eu/>. Data was collected in spring 2012 and resulted in a research sample in which 543 are employed in 94 public education workplaces and 700 employed in 128 public health workplaces. The results of the analysis show that change with significant impact on work assignments is common in both sectors. The employees are to varying degrees involved directly or indirectly in the change processes. The autonomy is frequently embedded in teams and discretion varies in work processes as well as in problem solving and learning. Test of innovative behavior drivers show strong positive effects from level of individual involvement in change processes and degree of complex problem solving in work. Test of the drivers of wellbeing show positive effects from individual involvement and level of discretion and negative effects from change and complex problem solving.

Keywords: professional, change, involvement, discretion, learning, innovative behavior, wellbeing

1. **Introduction**

Knowledge is of pivotal importance for professional work and the advantages of applied professional knowledge and innovation seem to be increasing at all levels of society. Parallel to the progress and increasing benefits of professional knowledge there has been extensive political and administrative initiatives to increase performance and cost efficiency in public professional organizations. In Denmark such public governance initiatives has progressively been launched towards public health and education organizations the last ten years. An important question is how the use of professional knowledge and the demands of governance reform interact in the work organizations: do the frames of rational and economic based reform initiatives prevent or improve conditions for applying knowledge in professional work organizations and what are the effects on innovative performance and wellbeing of the employees?

After a comprehensive structural reform in 2007 followed up by quality- and management reforms the external political administrative pressure on work performance in the Danish education and health sector seems to prevail. Traditionally, the two sectors have been characterized by extensive use of professional organization, where management as well as employees possesses far-reaching autonomy in work based problem solving, resting on applied professional knowledge and norms of good work practice. These norms are to a large degree a result of inter-subjective professional considerations on implementation principles and ethics for useful knowledge. The continuous absorption process of new knowledge can be denoted professional knowledge management. Thorough political and administrative initiatives, reforming the management and organization of the education and health sector, probes a question on to which degree the work organizations in the two sectors still are intact as professional knowledge organizations: knowledge organizations which are developing and applying professional insights dynamically in change processes and in the work assignments and tasks? Alternatively, have performance management and standardization of work demolished the professional knowledge based involvement and declined the innovative behavior of the employees based on their professional knowledge and their wellbeing related to the work?

The political idea of the comprehensive Danish structural reform in 2007 was to enlarge administrative units in order to concentrate expertise and efforts. The considerations rested both on providing economic efficiency and establishing larger and stronger professional environments (Greve & Ejersbo 2013). This reform depended to a large extend on reinforcement of management and it was followed up by initiatives inspired by New Public Management ideas of both performance and process management. These management ideas exposed change demands on the more collective and professional based local management practices, which had long traditions in the education and health sector. A quality reform, which followed the structural reform (Kamp, Kold og Caraker 2012) focused on quality of the services, establishing systems of monitoring and for management of quality. In accordance with the general aim of quality improvements, this reform also initiated new management education and training initiatives up to master level aimed at public sector organizations. This professionalization initiative was aimed at strengthening management in order to match the professional autonomy in the local public work organizations. Especially the health sector had political attention the following period on reducing long waiting lists for patient treatment. Together with the quality management initiatives this constituted an external pressure on local leadership in order to coordinate and standardize the efforts, so that the waiting lists could be reduced and the political quality aims fulfilled. In the education sector it was the international PISA evaluations, which put political pressure on teachers’ work with pupil planning and teaching quality in the primary schools. Parallel to this new budget and appropriation systems in education as well as health organizations became instruments enhancing the external performance pressure.

The political and economic governance principles and their rationales gradually and altogether meant an external determined upgrading of rational performance based management practices as well as top-down accountant biased techniques, which were aimed at controlling organizational processes and enhancing outputs. In line with this came numerous organizational changes, which directly or indirectly were driven by the new political and financial governance principles. All together the political determined initiatives and derived organizational changes can be expected to influence the professional autonomy in both sectors and thus how work is arranged and carried out by means of applied professional know how in discretional problem solving. To this come challenges to the important professional based creativity materializing as innovative behavior in work context and obviously not least the employees’ wellbeing. The aim of this article is to explore consequences of the external imposed governance demands through organizational change of the professional work organizations: have the professionals maintained operational work organizations, where they can apply their resources and discretionary knowledge both in processes of change and in solving problems in daily work and what do the developments imply for the professionals’ creativity and wellbeing?

1. **Theoretical approach, research questions and hypotheses.**

In order to understand what characterizes professional organizations as knowledge organizations it will be appropriate to start by considering what characterizes the professionals as actors and what establish their common organizational strength. One of the social science scholars who considered these characteristics was Max Weber. Max Weber understood the professional strength positions as established through occupational access control by means of knowledge monopolies on education and knowledge production within important areas of society. This occupational access control based on knowledge monopoly establishes foundation of the professional autonomy in relation to work practices of important society areas (Greve 2011). Professional autonomy through education and knowledge monopoly becomes the most efficient way to organize and develop work practices, where the assignments demand specialized, knowledge based discretion (Friedson 2001). In this way professionals and professional organizations becomes the functional most appropriate way to solve needs in society, which follow from the growing division of work and specialization in late modernity (Juul, Jørgensen & Sørensen 2009). For Talcott Parsons the professional work presupposes large degree of freedom, but at the same time it has decisive importance for society. This dilemma poses demand of some sort of democratic control. The challenge of democratic control is solved by a social contract which offers autonomy to the professionals, but at the same time responsibility for performance quality. This responsibility further implies utilization of ethical standards as well as expert knowledge and quality control within a collective frame of common professional interest rather than individual interests in relation to the work standards (Parsons 1969, Ibid 2009).

Eliot Friedson considers the power of developing and organizing own work assignments, resting on control over education as well as knowledge development and expertise, as a fundamental and decisive property which establish an ideal type status to the professional self-governance. It is an ideal type where the principles of knowledge development and organizing of own work assignments are managed and controlled by the profession in common, instead of free markets competition on work assignments or by the rules and rationality of state bureaucracy (Friedson op. cit. 2001). Never the less it can be observed how resent developments has posed pressure on the professional ideal type of governance. First state bureaucracy was using political economic arguments to expose pressure on professional control of education and on professional self-governance principles as guidelines for task solving in organizations. Later the free market was introduced as government mechanism through the principles constituting one of the two columns of new public management (NPM).

The most fundamental resource underlying and supporting professional autonomy is the knowledge in use both in education and in professional work. It is knowledge which is formalized, abstract and systematic produced by means of scientific methods. This means that the validity, the reliability and the general scope of the knowledge brought into use in work relations is under common professional surveillance and control. An important point is that the body of knowledge is challenged continuously and further developed by the professional communities as dynamic entities. The evolving body of research based knowledge, together with the scientific methods, is used as foundation in educating professionals and is continuously transformed and absorbed in the collective and global professional community, in such a way that it can be applied in problem solving and in practical work assignments performed in local professional and also semi-professional organizations. Professional and semi-professional knowledge is, however, not only formalized, abstract and systematic produced by scientific methods. The formalized knowledge is currently used in solving problems and in assignments and thus it becomes developed further through a deliberate focused practical use (Rasmussen & Nielsen 2011). The combination of explicit, formalized knowledge with tacit experience based knowledge, being transformed, communicated and accepted in professional communities of practices, establishes knowledge based standards of professional work assignment performance and experience (Engeström 1999, Rasmussen & Nielsen Ibid.). Good professional work practices and expertise thus continuously develop in line with learning based acknowledgements and pushes standards of expert performance efficiency in professional knowledge organizations.

The political economic pressure on the professional organizations can be expected to challenge the autonomy and the mechanism of continuously applying and developing knowledge in the work and change processes. Education of public governance actors initiated as part of the quality reform represents a challenge to professional autonomy by introducing alternative paradigms of work efficiency in professional organizations. The aim of these educations is to professionalize management of public organizations in order to strengthen the political and economic top down control of performance and development of the work processes in professional knowledge organizations. Organizational changes are expected to be a frequently used management instrument claiming demands on the professional work. Thus the first research question is:

* To what extend does change influence professional work?

Change at the workplace can imply new or significantly altered technology, relocation of employees, implementation of new methods of work and introduction of new or significantly changed services. Thus change dimensions can be quite interfering in the job relations and processes with consequences for professional autonomy. The most important question related to change in the professional organizations is to which degree the professional knowledge of the employees are included as resources in the decisions and at which phase the inclusion takes part:

* To which degree is the employees involved in the change decisions and at which phase of the process does the involvement take place?

As mentioned the collective element is important in understanding the structure of professional autonomy. The institutional carrier of the collective interests at the workplace is either the professional union or the local cooperation committee. The question of collective participation as resources complementing the degree of individual involvement is:

* Do professional unions or local cooperation committees participate in the change decisions and at which phase in the process does the participation take place?

The way management chooses to implement changes with implication for work can develop or reduce the importance of professional knowledge in processes of organization development and in work accomplishments. Thus standardization of work processes has become a common governance solution in some public organizations. Teamwork, however, has also spread. Teams can be configured as cross discipline groups with more or less autonomy and influence on work solutions.

* To what extend is teamwork used in organization of professional work; which degree of cross discipline are found and how is autonomy configured among team members?

In order to explore whether standardization of work has spread in professional organizations and perhaps put employee discretion under pressure, the following questions will be focused and analyzed:

* What proportion of time can the employee choose or change the content of the work tasks; the speed of work; the order in which tasks are undertaken and how the tasks are undertaken?

The analytical answers of the research questions so far should take bearing of the direction professional knowledge development has taken in the development of organizational frames of the Danish education and health sector. Within these frames it will be further investigated how complex problem solving and individual as well as collective learning is part of the current professional work. As mentioned such form of experience based and work related knowledge creation is an important complement to the research based and formalized knowledge, which is the foundation of professional authority, responsibility and discretion.

* How frequent are experiences of complex problem solving and individual as well as collective learning in the work?

The extend of change in professional work and insights of individual employees’ involvement in phases of change processes complemented by collective participation in the change phases deliver, together with work autonomy and discretion, as well as problem solving and learning, dimensions to test the influence on innovative behavior and wellbeing of the employees. The idea is that the empirical dimensions revealed by providing answers to the above research questions represent potential job related drivers in the professional organizations, which can materialize in knowledge based initiatives of figuring out solutions for improving areas of own work, thinking up new or improved products or services and trying to persuade the manager to support new ideas. Thus the following hypothesis can be stated:

* H1: Change activates professional resources which are positively related to innovative behavior

Parallel to the innovative performance the dimensions can be expected to influence wellbeing or social performance of the employees, however in such a way that change as demands are expected to influence wellbeing negatively and direct or indirect influence on change as well as discretion, problem solving and learning are expected as resources to influence wellbeing positively:

* H2: Change is negatively related and professional resources are positively related to wellbeing
1. **Data and method**

 Empirical data used to this analysis is from the Danish Meadow survey (Nielsen 2015). The survey was launched in summer 2012 and it links information on change in organization and work provided by questionnaires to employers and employees in private and public workplaces. From the population of workplaces with more than 25 employees a stratified and random sample of 2000 workplaces was drawn. The data collection by Denmark’s Statistics resulted in a research sample of 630 workplaces in 4 private and 2 public branches. From each of the 630 public and private workplaces, where the employer had completed and returned the questionnaire, 15 employees with at least 3 years of tenure was randomly selected. Samples of employees were drawn and data collected in 4 “waves” after cumulating completed and returned employer questionnaires. The data collection resulted in 3362 employee questionnaires which equals a response rate of 37.2 %. In this research only data from the employee responses of the public education and the public health workplaces is used. It is 543 employees from 94 workplaces in public education and 700 employees from 128 workplaces in the public health sector. The research sets focus on the development in the organizations of the two public sectors from an employee perspective. The methods used in the analysis are first bivariate techniques. The dimensions tested as drivers of innovative performance and wellbeing is constructed as composite indexes (OECD 2005). The dependent variable of innovative performance is also constructed as a composite index and wellbeing is constructed as a scale of six items developed by Warr and Parker (Meadow guidelines 2010).

1. **Change, involvement and participation**

Parallel to the political-administrative attempts to introduce management techniques with focus on performance and processes, a comprehensive development has taken place concerning absorption of new technology, organizational relocation of employees, implementation of new work methods and introduction of new products or services. Such changes have affected both the education and the health sector and they have potential of more or less substantial influence on the practices of professional work. We shall open our study of the extent to which organizational change influence professional work in knowledge organizations by presenting a description on change in work related to new technology, relocation of employees, implementation of new methods and introduction of new services which has taken place in the period 2009 – 201. Changes in workplaces are classified according to more or less substantial influence on the professionals’ work.

Table 1.1. Change at the workplace in the period 2009 – 2011 by sector (percent shares \*)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Technology | Relocation | Methods | New P/S | N |
|  | Yes, substantial | Yes, not substantial | Yes, substantial | Yes, not substantial | Yes, substantial | Yes, not substantial | Yes, substantial | Yes, not substantial |
| Education | 52,5 | 24,3 | 37,4 | 27,1 | 37,2 | 18,8 | 29,8 | 15,5 | 543 |
| Health | 56,6 | 18,3 | 52,9 | 25,9 | 42,3 | 19,9 | 41,7 | 19,7 | 700 |
| Both sectors | 54,8 | 20,9 | 46,1 | 26,4 | 40,1 | 19,4 | 36,5 | 17,9 | 1243 |

Question: Have any of the following changes taken place in your workplace in the period 2009 – 2011:**a)** Implementation of new or significantly changed machines, techniques or ICT systems? **b)** Relocation of employees? **c)** Implementation of new or significant change in the method of work? **d)** Introduction of a new or significant changed product or service?

\*) Percent shares do not sum to 100 %, while ‘No’ is omitted in the table.

Technological development has obviously had comprehensive influence on work in both sectors. This is particularly pronounced in the health sector where 57 percent of the employees state that introduction of new technology in the period has had substantial influence on their work. Less than one fourth of the employees have no experience with such changes. Also in the education sector a large share of the employees has had their work substantial affected by introduction of new technology. It seems characteristic for both sectors that introduction of new technology is inclined to substantially influence the involved employees’ work. An obvious example of influence is new technology leading to reallocation of the employees or considerable change in the methods applied in their work. These relations seems to be present in the health sector when observing the level of substantial change related to technology, relocation and work methods. The share having their work substantial changed due to new products or services is also high in this sector. In the education sector it is more moderate shares that have experienced relocations and changed work methods with substantial influence. Product or service innovation with profound influence on work is also lower here. In order to have a single measure on change occurrence with more or less substantial influence on work, a cumulative index of change, summarizing each employees score on each of the four dimensions has been calculated. Change related to each of the dimensions is weighted 2 if it has substantial influence on work, 1 if not substantial influence and 0 if there is no change (Nielsen 2015).

The comprehensive but also differentiated practice of change with influence on work can put a considerable pressure on the professional autonomy and the discretion in current work assignments. Changes may imply that technical determined causes set up narrow frames for application of specific professional knowledge. Such frames can be softened or penetrated by involving the employees directly in the decision process concerning the changes and their implications or by including employees’ professional organizations or institutions for cooperation between management and employees of the workplace. First we will set focus on involvement of employees directly in the change processes in the two sectors.

Table 1.2. Personal involvement in change at the workplace by sector (percent shares)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Idea development | Negotiations | Decisions | Implementation | N |
| Public education sector | 45,4 | 30,6 | 30,4 | 56,7 | 487 |
| Public health sector | 38,5 | 30,0 | 25,8 | 56,9 | 671 |
| Both sectors  | 41,4 | 30,2 | 27,7 | 56,8 | 1158 |

Question: Did you personally take part in: **a)** Idea development of the changes? **b)** Negotiation of the changes? **c)** Decisions on the changes? d) Implementation of the changes?

From a management perspective there are considerable advantages related to involving employees in changes taking place at the workplace. Not only do implementations of change initiatives tend to be more successful but the ideas from the professionals may imply that the chances trigger of an increase in capabilities of the organization, brought about by involving the ideas and knowledge of the employees. Empirically the table shows a propensity to involve the employees in the idea phase of changes. This is most pronounced in the education sector and the education sector also score highest on involvement in the decision phase. In the health sector we find a parallel pattern with involvement in the idea phase, however at a lower level. This could indicate that part of the changes in this sector are external determined in the sense that it is political administrative initiatives decided in management areas above the workplace. This means that individual employees cannot be involved directly in the ideas and decisions on the changes. Just like for the index of change, an index of involvement is calculated. This index weight participation in idea development 4; negotiation 3; decisions 2; implementation 1 and no involvement 0 (Ibid). The distribution on the index show that for both sectors there are polarization tendencies, with largest shares of employees having broad involvement or having no involvement. This tendency is most pronounced in the education sector. Parallel to the individual involvement in change it is interesting to explore the extension of indirect involvement through professional union and cooperation committees. The professional unions and cooperation committees handle the collective interests of the employees and theoretically this involvement is called participation (Hyman and Mason 1995). The indirect involvement or participation on the collective level is shown for the two sectors in the table below.

Table 1.3. Trade union or cooperation committee participation in change at the workplace by sector (percent share ”yes”)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Idea development | Negotiations | Decisions | Implementation | N |
| Public education sector | 32,2 | 39,6 | 30,0 | 33,1 | 487 |
| Public health sector | 37,9 | 39,0 | 34,4 | 36,4 | 671 |
| Both sectors  | 35,5 | 39,3 | 32,6 | 35,0 | 1158 |

Question: Did a trade union or cooperation committee participate in: : **a)** Idea development of the changes? **b)** Negotiation of the changes? **c)** Decisions on the changes? d) Implementation of the changes?

Comparing extend of collective participation in change with individual involvement exposes interesting details. First of all the collective participation in the idea phase is more comprehensive for the health sector and reaches a level equal to the individual involvement in this phase. This seems to confirm the assumption that some of the changes in this sector are political and administrative initiated at a level where more collective interests and institutions are more appropriate to involve in the early phases. The collective interest representation is more present in the negotiations and the decisions, especially in the health sector. Observing participation in implementation, it is clearly on a much lower level, compared to the individual involvement. This can be taken as a sort of division of labor between the collective and individual level, which is most observable in the health sector. In the same way as for the involvement index an index of participation is calculated. This index weight degree of participation in exactly the same way as the former index weighted degree of involvement. The index distribution reflects the more comprehensive participation in the health sector, but at the same time it shows a polarization in the outer categories which means that participation is either wide or absent. This pattern is particularly evident in the health sector, but it is also present in the education sector. Overall it seems that there is extensive involvement and participation in both in health and education sector, following a pattern that seems to enable communication of employee knowledge directly and indirectly towards most decision stages. The question which follows from this behavioral pattern is whether employees are satisfied with the influence on the organizational change. This is shown in the table below.

Table 1.4. Satisfied with influence on change at the workplace by sector

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Very satisfied | Satisfied | Not particular satisfied | Not at all satisfied | N |
| Public education sector | 13,3 | 49,1 | 26,7 | 10,9 | 487 |
| Public health sector | 13,0 | 46,5 | 29,2 | 11,3 | 671 |
| Both sectors  | 13,1 | 47,6 | 28,2 | 11,1 | 1158 |

 Question: How satisfied were you with the degree of involvement in the decisions on change?

As can be noticed, there is substantial uniformity in the distribution of satisfaction with the influence of change in the two sectors. A proportion just under half of employees are satisfied with the influence and not particularly large groups are very satisfied. The latter groups are only slightly larger than the groups of not at all happy. However, there are also large groups who are not particularly happy in both sectors. If the opinion balance of the two sectors is calculated, it turns out to be + 25 in the education sector and +19 in the health sector. In other words, a majority of satisfied, but the optimistic weight is not impressive - particularly for the health sector.

1. **Autonomy and discretion**

 Having empirical insight into the extension of change with varying consequence for work and into the employees' potential influence on the phases of the change process, both through the individual involvement and through collective participation, we shall continue by looking closer at the potentials and possibilities that the work organization frames for the employees’ professional autonomy and discretion in solving the work assignment. As the team organization often comprises frames of autonomy, we shall first look at how teamwork has developed over a three year period within the two sectors. Of special interest is how teamwork changes with individual work during the working time of the employee.

Table 2.1. Extension of teamwork by sector (percent share)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | More than 50 % of work time | 25 % up to 50 % of work time | 1% to under 25% of work time | Do not work in team | N |
|  | 2012 | PDI\*12-09 | 2012 | PDI\*12-09 | 2012 | PDI\*12-09 | 2012 | PDI\* 12-09 |
| Education | 23,2 | 1,5 | 17,7 | 1,5 | 46,6 | 0,7 | 12,5 | -3,7 | 543 |
| Health sector | 50,3 | 2,9 | 13,6 | -0,3 | 18,6 | 2,5 | 17,6 | -5,0 | 700 |
| Both sectors | 38,5 | 2,3 | 15,4 | 0,5 | 30,8 | 1,7 | 15,4 | -4,4 | 1243 |

Question: How much of your time at work is spend working in team?

\* PDI (percent difference) is a simple measure for the difference between two percent shares (here percent share in 2012 minus percent share in 2009).

 Teamwork is widely used in the two sectors and this organizational form is growing over the three years: In the education sector it is only one out of eight and in the health sector is the only a little more than one in six employees who do not work in a team. However, the two sectors are quite different when looking at the way in which the employees are related to teamwork during their working time. In the education sector team work typically interchange with individual work and almost 47 percent of the employees work in teams between 1 and 25% of working time. The development trend shows that it is the more extensive teamwork that is growing over the three years. In the health sector half of the employees work in teams more than half of working time and not as many changes between teamwork and individual work. To change between teamwork and individual work provides flexibility in work organization at the relational level. This relational flexibility can be compared with functional flexibility and is an important aspect when it comes to focusing on employee autonomy and scope for discretion in the work.

Table 2.2. Ordinary team members influence by sector (percent shares)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Election of team leader | Work goals for the team | Allocation of work tasks | How work is carried out | N |
| Public education sector | 38,5 | 74,6 | 73,2 | 91,4 | 488 |
| Public health sector | 17,1 | 68,9 | 65,5 | 86,2 | 595 |
| Both sectors  | 26,8 | 71,5 | 69,0 | 88,6 | 1083 |

Question: Can ordinary team member make influence on: **a)** Election of team leader? **b)** Work goals for the team? **c)** Allocation of work tasks? **d)** How work is carried out?

If we consider the extent of autonomy and opportunities of influence that the employees who work in the team possess in the two sectors, it is evident that autonomy and influence are at a higher level at all parameters in the education sector. Selection of team leader and formulation of work goals for the group is essentially management instruments, which largely rests within team member autonomy in this sector. Prioritizing tasks is largely delegated to the teams and management does apparently not interfere in how work is done. In the health sector, there are less than half of the employees in teams, who have autonomy to choose their team leader and the influence on work goals are at a significantly lower level as well compared to the education sector. In relation to both the professional autonomy and to providing knowledge and learning in the work process, it is worth looking at how large proportions of team employees who work in interdisciplinary teams. This is shown in the table below.

Table 2.3. Cross discipline in teams by vocational education (percent horizontal)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | From own and other professions | From other professions | From own professions | N |
| Public education sector | 32,8 | 8,2 | 59,0 | 488 |
| Public health sector | 52,8 | 12,9 | 34,3 | 595 |
| Both sectors  | 43,8 | 10,8 | 45,4 | 1083 |

Question: Where does the other members of the team come from: **a)** From the same profession as you? **b)** From other professions? **c)** From both your and other professions?

It is quite obvious that the interdisciplinary approach is much more common in the health sector than it is in in the education sector. In the health sector two out of three team members work interdisciplinary, while this is the case for only two out of five in the education sector. More employees in the health sector work in teams, where all the other team members come from other professions. This means that the team member will be alone in enforcing the professional paradigm, but it may on the other hand also improve opportunities for optimal and innovative solutions, as several professional knowledge sources combine in a joint task performance (Nielsen 2014).

The widespread use of team organization with its significant influence on work coordination and performance complements the image given by the analysis above of the direct and indirect involvement in processes of change in the two sectors. To understand the extent of the professional autonomy, it is also worth exploring the extent of discretion in accomplishing the work tasks. Our approach chosen is an estimate on how much of the time the employee can choose or change the content of the work, the pace of work, the order of execution of the tasks and how tasks are performed.

Table 2.4. What proportion of the time can the employee choose or change content, speed, order and method of performing your work tasks by sector (percent horizontal)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Content | Work speed | Task order | Methods | N |
| **> 50%** | **25-50**  | **< 25%** | **> 50%** | **25-50**  | **< 25%** | **> 50%** | **25-50** | **< 25%** | **> 50%** | **25-50** | **< 25%** |
| Education sector | 47,0 | 25,2 | 27,8 | 48,1 | 24,1 | 27,8 | 59,5 | 27,8 | 12,7 | 74,4 | 19,3 | 6,3 | 543 |
| Health sector | 25,6 | 24,9 | 49,6 | 31,4 | 30,6 | 38,0 | 48,9 | 30,7 | 20,4 | 53,1 | 24,7 | 22,1 | 700 |
| Both sectors  | 34,9 | 25,0 | 40,1 | 38,7 | 27,8 | 33,5 | 53,5 | 29,4 | 17,1 | 62,4 | 22,4 | 15,2 | 1243 |

Question: What proportion of the time at your work can you choose or change: **a)** The content of your work tasks? **b)** Your work speed? **c)** The order in which you undertakes tasks? **d)** How you perform your work tasks?

\*) In the same way as for involvement and participation an additive index of discretion and influence on work dimensions has been calculated: High influence score 11 – 12 point, middle influence score 8 – 10 point and low influence score 4 – 7 point.

The extent of employees with discretion on the four dimensions vary unambiguously in favor of the education sector, although it is clear across sectors that professional influence is strongest concerning methods of work accomplishment. Here, more than half in the health sector and almost three quarters of the employees in the education sector have influence more than 50 percent of the time. Next to influence on methods of work tasks follow the influence on the order of task execution, where the influence level are more equally distributed between the two sectors. About half of the employees in the health sector have influence on the sequence of tasks and almost three fifths have this influence in the education sector. When it comes to influence the pace of work, the distribution is more skewed to the education sector's advantage. Looking at the impact on the content of work, this is much more extensive in the education sector. This is probably structurally determined by contextual dimensions formalizing general professional guidelines on effective treatments that should be used in the health sector, in comparison with guidelines for the teaching to be used in the education sector.

1. **Problem solving and learning**

The analysis has shown how work in the two sectors has been affected by organizational changes, and it became clear that a share of both the individual employees and their organizations and cooperation institutions are involved in the processes of change, in such a way that the individual and the collective influence channels seems to complement each other. The involvement and participation pattern of the two sectors are different. The same emerges for the pattern of autonomy through team organization and discretionary influence on the content of work. Despite the differences, it is demonstrated that employees’ knowledge to a varying degree is brought into use, both in the processes of change and in the performance of daily tasks. As mentioned, professional knowledge has a formal educational and science based foundation and an informal more experiential superstructure. Compared to the development in work requirements, it is interesting to look at the level of complex problem solving in work. Complex problem solving in professional work draws on formal, abstract and systematic knowledge, but also on tacit and experience-based knowledge used in focusing practical problem solving. We can examine this assumption by looking at how often employees of the two sectors are faced with a new and complex problem where it takes at least 30 minutes to find a good solution.

Table 3.1. Complex problem solving in work by sector (percent horizontal)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Every day | At least once a week | At least once a month | Less than once a month | Never | N |
| Public education sector | 8,5 | 43,8 | 32,6 | 12,7 | 2,4 | 543 |
| Public health sector | 8,9 | 35,6 | 25,6 | 23,9 | 6,1 | 700 |
| Both sectors  | 8,7 | 39,2 | 28,6 | 19,0 | 4,5 | 1243 |

Question: How often are you confronted with a new or complex problem that takes at least 30 minutes to find a good solution?

Although requirements for doing the work tasks according to the employees, demanded longer experience in the education sector, it is still surprising that there are clear differences in how often complex problem solving occurs in work within the two sectors. In the education sector complex problem solving occurs at least once a week or more frequent for over half of the employees, while the same is true for 45 percent of the employees in the health sector. Conversely, complex problem solving appears less than once a month for 30 per cent of employees in the health sector and for 15 per cent of employees in the education sector. However, there is a share of 9 percent in the health sector that solves problems every day - a similar proportion as in the education sector. Even with the somewhat uneven distribution it must be concluded that complex problem solving is widely used in the two sectors. Since it is problems to which it takes at least 30 minutes to find a good solution, it indicates extensive discretion in the work assignments. Employees have to bring their knowledge and experience into play in a process aimed at identifying the best professional solution (Nielsen op. cit. 2012). The problem solving in this way may become a driving force of learning new things at work – a recognition that is essential for accumulating tacit experience-based knowledge. The extent to which the employees experience learning new things in the job is shown in the table below.

Table 3.2. Learning new things by sector

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Every day  | At least once a week  | At least once a month  | Less than once a month  | Never Aldrig | N |
| Public education sector | 22,7 | 39,2 | 25,4 | 11,6 | 1,1 | 543 |
| Public health sector | 20,4 | 26,1 | 29,3 | 23,3 | 0,9 | 700 |
| Both sectors  | 21,4 | 31,9 | 27,6 | 18,2 | 1,0 | 1243 |

Question: How often does your job involve: **a)** That you learn new things **b)** That you help your co-workers to learn new things?

More than one in five employees have experienced learning new things in the job every day and it is the case for almost equal shares in the two sectors. This is remarkable because it is twice as high proportions as we saw above daily solve complex problems. Conversely, it should be noted that there is a large group in the health sector, where the experience of learning occur less than once a month. This may be an indication of the extension of standardized work processes that does not include the possibility for experiential learning in the health sector. This group is less than half as large in the education sector. For the education sector it is of course essential that the work is experienced as learning. This is an essential prerequisite for teaching. To teach is however not just important as a work task, but of equally great importance in the social relations of a learning organization. It is thus characteristic of the organizational learning perspective, termed learning in communities of practice (Lave and Wenger 1991). In this learning perspective it is important that each employee informally helps his colleagues to learn new things. This learning aspect, we have asked for in a question of learning new things in the job.

Table 3.3. Helping co-workers to learn new things by sector

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Every day  | At least once a week  | At least once a month  | Less than once a month  | Never  | N |
| Public education sector | 13,3 | 34,8 | 33,7 | 16,6 | 1,7 | 543 |
| Public health sector | 22,0 | 35,0 | 23,4 | 17,3 | 2,3 | 700 |
| Both sectors  | 18,2 | 34,9 | 27,9 | 17,0 | 2,0 | 1243 |

Question: How often does your job involve: **a)** That you learn new things **b)** That you help your co-workers to learn new things?

Although we could observe that individual problem solving and learning was more common among employees in the education sector, it is obvious from the table that the collective learning is more prevalent within the health sector. Over half of the employees thus indicate that at least once a week or more often they helps colleagues learning new things, whereas in the education sector almost half of the employees is included in such learning relationships. This difference is probably due to the way work is organized. In the health sector it is very common for employees to work in teams more than half of the work time and fewer changes between teamwork and individual work, compared to the education sector. When the formal teams in such a way function as communities of practice for learning, it must be expected that it provides a good basis for innovative behavior, even though the individual complex problem solving does not include quite as many. Therefore, it will be interesting to examine to what extent the observed problem solving and learning materialize in innovative behavior among employees in terms of the development of new solutions to improve their work and the services that are produced and the extent to which employees in the two sectors thrive in their work.

1. **Innovative behavior and wellbeing**

Finding new solutions to improve areas of own work; thinking up new products or services and trying to persuade the manager to support new ideas give evidence on possessing creative skills building on professional knowledge, but also of resource surplus to bring knowledge and skills into play in behavior to improve task performance. It demonstrates professional commitment and trust in one's own knowledge to develop work for the benefit of the organization. Therefore the three dimensions are indicators of the concept which can be defined as innovative behavior. Such innovative behavior may be more or less radical. To figure out new solutions in order to improve one's work is likely to be less radical innovative than thinking up new products or services and is trying to persuade the manager is essentially an intermediary dimension to transform innovative ideas into actual behavior.

Table 4.1. Innovative behavior in work by sector (percent share)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Figured out solutions for improving work | Thought up new or impro. prod. or service  | Tried to persuade your supervisor to support  | N |
| Public education sector | 91,3 | 57,3 | 68,7 | 543 |
| Public health sector | 84,7 | 46,9 | 66,0 | 700 |
| Both sectors  | 87,6 | 51,4 | 67,2 | 1243 |

Question: Have you within the last year: **a)** Figured out solutions for improving areas of your own work? **b)** Thought up new or improved products or service for the workplace? **c)** Tried to persuade your supervisor or manager to support new ideas?

Evidently, there is a majority of the employees in the education sector, which has figured out solutions to improve the areas of work within a year. This indicates clearly that didactics is part of the professional practice development. More surprising is that the proportion which has figured out solutions to improve the areas of work also is very high in the health sector. Almost the same distributional structure is found in relation to employees who have thought up new products or services in the two sectors. Similarly, the shares of employees who have been trying to persuade the manager to support new ideas show a commitment and a belief in innovation at the workplace, which includes two-thirds of employees in both sectors. Following the same methodology as used above, there is established an additive index of the three indicators of innovative behavior. This index is categorized binary and used as the effect variable in a logistic regression model. Change in work, direct involvement and indirect participation are used together with autonomy, discretion and the learning dimensions as explanatory variables in the model and control variables are size of workplace and sector. The intention is to test the dimensions of change, influence and learning as drivers for innovative behavior. Only significant results where at least one of the level effects of the dimensions has a P value (Sig.) which is smaller than 0.05 are included in the table.

Table 4.2. Logistic regression of change, involvement, participation, autonomy, problem solving and learning on innovative behavior, controlled for sector and workplace size

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | B | Wald | Sig. | Exp(B) | 95% C.I.for EXP(B) |
| Lower | Upper |
|  | Change |  | 10,837 | ,004 |  |  |  |
| Change (1) | ,616 | 9,289 | ,002 | 1,852 | 1,246 | 2,752 |
| Change (2) | ,552 | 7,802 | ,005 | 1,736 | 1,179 | 2,557 |
| Involvement |  | 33,608 | ,000 |  |  |  |
| Involvement (1) | ,498 | 6,897 | ,009 | 1,645 | 1,135 | 2,384 |
| Involvement (2) | 1,127 | 33,561 | ,000 | 3,087 | 2,108 | 4,520 |
| Problem solving |  | 18,033 | ,000 |  |  |  |
| Problem solving (1) | ,752 | 12,412 | ,000 | 2,121 | 1,396 | 3,223 |
| Problem solving (2) | ,819 | 14,177 | ,000 | 2,268 | 1,481 | 3,473 |
| Problem solving (3) | ,995 | 7,573 | ,006 | 2,705 | 1,332 | 5,495 |
| Learning |  | 5,784 | ,123 |  |  |  |
| Learning(1) | ,365 | 2,782 | ,095 | 1,441 | ,938 | 2,213 |
| Learning(2) | ,446 | 3,164 | ,075 | 1,562 | ,956 | 2,553 |
| Learning(3) | ,644 | 5,367 | ,021 | 1,904 | 1,104 | 3,282 |
| Constant | ,317 | ,102 | ,750 | 1,373 |  |  |

Results of modeling drivers of innovative behavior presented in the table should be read in such a way that for each of the included dimensions representing change, influence and learning, the chances for innovative behavior is examined by comparing odds for the dimension’s lowest level (called baseline) first with middle degree (1) and then with higher degree (2) and possibly with highest degree (3) depending on whether the dimension index is classified into three or four categories. The effect measure is thus an expression of how much the chance for innovative behavior is increased by means of middle (1) high (2) and highest (3) degree compared with the lowest degree on the dimension index and the P value (Sig.) represents the probability that the effect depends on statistical coincidences. If we look at the change dimension it appears that this has a positive effect on innovative behavior. This indicates that the degree of change in work increases the chance for innovative behavior among employees, with the degree of direct or indirect involvement kept constant. If we next look at the involvement dimension this has obviously a powerful effect on innovative behavior that varies with the level of involvement. Thus, the highest level of involvement increases the chances of innovative behavior three times, compared to the lowest level. The degree of problem solving in work also increases the chance for innovative behavior at a pace that almost reaches the level of involvement in change. On the other hand the experience of learning and teaching others in the work has not so clear and significant effect on innovative behaviour. Only the highest degree of this dimension is significant and has an effect which almost doubles the chances of innovative behavior. In other words, according to the model it is the degree of personal involvement in changes at work and the degree of complex problem solving in the work, which are the strongest drivers of employee innovative behavior in both sectors, but changes at work as such and learning at work also play some more moderate role as drivers.

With the many changes and challenges at the workplace observed one may ask what this means for the wellbeing of the employees. In this context wellbeing is understood as a subjective phenomenon - an experience of the individual employee - which is assumed and measured to be determined by the work relations. Thus for measuring employee wellbeing is used items from a work-related wellbeing scale, developed by the Institute of Work Psychology (Warr and Parker, in Meadow 2010) The result of the measurement of the employees of the two sectors are presented below.

Table 4.3. Wellbeing in job: How much of the time in the past week has your job made you feel each of the following: (percent horizontal)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Newer | Less than 1 day | 1 – 2 days | 3 – 7 days |
| Tense E\* | 28,7 | 33,0 | 24,3 | 14,0 |
| Tense H\* | 32,1 | 34,9 | 20,9 | 12,1 |
| Worried E\* | 33,5 | 34,6 | 20,6 | 11,3 |
| U Worried H\* | 36,3 | 35,3 | 16,9 | 11,5 |
| Uneasy E\* | 63,0 | 22,7 | 10,1 | 4,2 |
| Uneasy H\* | 67,0 | 19,4 | 8,4 | 5,1 |
| Gloomy E\* | 66,3 | 20,6 | 7,2 | 5,9 |
| Gloomy H\* | 66,4 | 18,7 | 8,9 | 6,0 |
| Depressed E\* | 77,9 | 14,2 | 4,6 | 3,3 |
| Depressed H\* | 80,7 | 11,4 | 3,9 | 4,0 |
| Miserable E\* | 84,5 | 9,8 | 3,9 | 1,9 |
| Miserable H\* | 84,6 | 8,3 | 3,3 | 3,8 |

Question: How much of the time in the past week has your job made you feel each of the following: **a)** Tense? **b)** Uneasy? **c)** Worried? **d)** Depressed? **e)** Gloomy? **f)** Miserable?

\* E = Education sector

\* H = Health sector

The first three dimensions of the well-being scale relate to work-determined anxiety, while the three following relate to depression. The table shows the employee scores on each of the six dimensions respectively for education sector (E) and health sector (H). It is hardly surprising that in general anxiety is more prevalent than the feeling of depression among the employees. For both sectors it can be observe that anxiety is quite common. About one third has felt tense or worried a day or more, whereas the uneasiness is less frequent and more in line with the depression dimensions. Around one in eight of the employees have had a sense of gloominess for more than a day of the week and 8 percent had feeling of being depressed. There is a systematic trend showing that employees in the education sector thrive worse than healthcare professionals. This is interesting as the education sector scores lower on change in work, but in turn higher on individual involvement and problem solving in the work. To establish the scale of wellbeing a single measure is constructed, so that the response "never" is weighted 1 point, the response "less than 1 day" is weighted 2 points, the response "1-2 Days" is weighted 3 points and the response answer "3 - 7 days "is weighted 4 points. The distribution of wellbeing in the two sectors it reflects what we could observe above that education sector employees tend to thrive worse than employees in the health sector. It therefore will be relevant and interesting to examine whether changes in work, direct or indirect involvement, problem solving or learning have effect on the level of wellbeing. The wellbeing index is used as dependent variable in a logistic regression model where low wellbeing constitute the baseline and the effects are thus measured as the chance for higher wellbeing in the work. As explanatory variables are used level of change and involvement, problem-solving and learning dimensions and as control variables are included size of workplace and sector.

Table 4.4. Logistic regression of change, involvement, participation, autonomy, problem solving and learning on wellbeing, controlled for sector and workplace size

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | B | Wald | Sig. | Exp(B) | 95% C.I.for EXP(B) |
| Lower | Upper |
|  | Change |  | 17,149 | ,000 |  |  |  |
| Change (1) | -,371 | 2,220 | ,136 | ,690 | ,424 | 1,124 |
| Change (2) | -,895 | 14,320 | ,000 | ,409 | ,257 | ,650 |
| Involvement |  | 16,514 | ,000 |  |  |  |
| Involvement (1) | ,067 | ,112 | ,737 | 1,070 | ,721 | 1,587 |
| Involvement (2) | ,776 | 13,733 | ,000 | 2,173 | 1,442 | 3,277 |
| Autonomy |  | 10,744 | ,005 |  |  |  |
| Autonomy (1) | ,484 | 6,453 | ,011 | 1,623 | 1,117 | 2,359 |
| Autonomy (2) | ,635 | 9,066 | ,003 | 1,886 | 1,248 | 2,851 |
| Problem solving |  | 15,338 | ,002 |  |  |  |
| Problem solving (1) | ,272 | 1,060 | ,303 | 1,312 | ,782 | 2,202 |
| Problem solving (2) | -,335 | 1,757 | ,185 | ,716 | ,436 | 1,174 |
| Problem solving (3) | -,898 | 7,051 | ,008 | ,407 | ,210 | ,790 |
| Constant | -2,080 | 4,146 | ,042 | ,125 |  |  |

The results of the model show that highest degrees of change as well as problem solving in the work puts strain on employees, which affects the chance of well-being in a significant negative direction so that the chance of high wellbeing is more than halved compared to the chances that exist for the lowest degrees of change and problem solving. Conversely, it appears that individual involvement in change and autonomy in work affects wellbeing positively, so that the chance of high well-being is doubled. The difference between the effects of the two former and the two latter effects is probably due to that the two latter - involvement and autonomy - leads to a sense of control over the work situation, while the two former – change in work and problem solving – leads to a sense of risk and demands in the work situation. The relationship between job control and job demands have been proved to be of importance for the development of stress and thus also for well-being. Thus, we have uncovered positive forces of control at work and negative drivers of job demands on wellbeing among professional employees complementing former results (Karasek1979 ).

1. **Discussion and conclusion**

Through the study of the education and health sector, we have focused on whether the political administrative initiatives and the management renewal in the two sectors as frames have implied gaining or loosing assets as professional work organizations. By professional work organizations we understand organizations where employees use and develop their knowledge as a key resource, both in connection with organizational changes and in the solution of the current work assignments. In relation to the administrative initiatives and the management renewal, organizational changes frequently affect the professionals’ work. The health sector has been most exposed to changes affecting the work significantly and less than a third of employees are not affected by such changes. In the education sector a more modest proportion has been exposed to relocations and to new or revised working methods, with significant impact on the work. In general the education sector to a lesser extent has been exposed to high levels of change in work practices.

The involvement of employees' knowledge early in the change processes is a key dimension in our definition of professional organization and the analysis show, that there actually are tends to involve employees in the early phases at the development of ideas of change. This tendency is most evident in the education sector, but also in the health sector almost two fifths of the employees are involved in the development of ideas. The difference in the level of involvement concerning the development of ideas in the two sectors may be due to the nature of change in the health sector that more frequently takes form of externally developed solutions or programs, which are negotiated in detail and implemented locally. Observing involvement by how early in the process it takes place, there is a tendency towards bipolarity in the involvement. The pattern of collective participation in the changes seems to complement the pattern of individual involvement. Thus, the collective participation in the idea phase is more widespread in the health sector and proportions between two fifth and one third of the employees experience that their interest presentation takes part in discussions and decisions.

The way work is organized is important for the degrees of freedom and the autonomy of the professionals in performing their work assignments. Team organization is seen as a frame for the professionals to practice more or less autonomy in the organization and in execution of their work. The analysis shows that teamwork is growing and fairly widespread, but there are major differences in how team work is applied in the two sectors. In the education sector team work exchange frequently with individual work, while such a phenomenon is less common in the health sector. Autonomy through team work is widespread, but mostly in the education sector. Interdisciplinarity, which is most prevalent in the health sector, allows for work solutions that incorporate knowledge from several professions. Discretion in accomplishing work assignments is most prevalent in the education sector, but certainly also found in the health sector. It is frequently discretion on methods and on order of the work tasks. The scope of influence seems structurally determined by the different nature of tasks in the two sectors.

In different ways the employees’ professional knowledge is brought into use, both at the individual level and more collectively in teams and cooperation committees. This happens most clearly in the change processes, but certainly also in performance of the daily work. The extent of complex problem solving in the work is interesting from a knowledge-economic perspective. Complex problem solving appears to be most prevalent in the education sector, but it also reaches significant levels in the health sector. Also individual learning is most prevalent in the education sector, but collective learning occurs more frequently in the health sector. Probably the extensive use of team organization in the health sector constitutes communities of practice for the collective learning.

Do the identified development trends mean that the employees utilize their knowledge to innovative behavior in the organizations? Formulating solutions to improve the work is extremely widespread among employees, especially in the education sector. It is probably didactics significant for practice development, which is in stake here. Large proportions of employees have also thought up new products or services and two thirds of the employees have tried to persuade their leaders to support their ideas.

In order to identify the driving forces of innovative behavior among the development dimension, the dimensions are tested in a logistic regression model with the innovative behavior as effect variable. It turns out to be the degree of individual involvement in change process and the degree of complex problem solving, which according to the model are the strongest drivers of innovative behavior, but change incidents in themselves and learning at work also plays a significant role as drivers.

While innovative behavior contributes to productive or economic performance of the professional organizations, the employee wellbeing represents social performance. Systematic trends show that employees thrive less in the education sector than they do in the health sector. This despite the fact that the education sector score lower on changes, but higher on involvement and problem solving in the work. These dimensions are tested in the same manner as above using a logistic model to test the driving forces for wellbeing. The model reveals positive driving forces related to employee control (involvement and autonomy) and negative drivers associated with requirements related to the work demands (change and problem solving). In this way, the results approximate an updated version of a classic model (Karasek 1979) for stress risk and psychological work environment.

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