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## **Mentoring in a medical faculty: a chance for organisational learning**

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**Abstract:** The use of mentoring in academia as a strategy to support individual academic careers has a long tradition. It has been shown that the combination of mentoring as well as training sessions to acquire interdisciplinary

key competences and networking activities is suitable for enhancing the individual's skills in various ways. In addition, it is evident that mentoring has a strong link to organisational learning as individual and institutional aims become connected and personal knowledge is transformed into collective knowledge. To date, the impacts of mentoring programs on the organisational development in universities have received little or no attention.

**Keywords:** universities; postdoctoral researchers; career development; women; medicine; organisational development; learning organisation; human resources; knowledge transfer; networking.

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## 1 Introduction

Formal mentoring as a measure to achieve equal opportunities in academia was established over 20 years ago. However, it originally belongs to the area of human resources development (Hezlett and Gibson, 2005). By imparting informal field knowledge of university medicine through mentoring programs, academic professional fields become more transparent to the new generation of researchers, while seminars prepare participants for future leadership positions and networks facilitate careers for young medical academics.

Over 60% of all students in the Medical Faculty are female students. However, only very few of them reach leading positions in universities. At the medical department of the University Essen in Germany, the 'MediMent<sup>1</sup> 1:1' and 'MediMent-Peer' mentoring

programs (described in detail below) have been established in order to close the gender gap in scientific leading positions in the medium and long-term. Each programme has a run-time of two years. They start lagged by one year and thus overlap each other for a 12-month period during each mentoring run.

In this context, the following question arises: What change potential for the organisation does this kind of individual advanced training for graduated young medical academics have? What fruit do generating additional networking structures within an in-house mentoring program by facilitating new knowledge creation and sharing bear?

To our knowledge, in mentoring research, there are no systematic investigations of a possible relationship between mentoring and the advancement of organisational learning (Allen et al., 2008). Even though several researchers have suggested such a relationship before (Bullis and Bach, 1989; Burke et al., 1994; Van Slyke and van Slyke, 1998; Mullen and Noe, 1999; de Vries et al., 2006; Poulsen, 2013; Cole, 2015; Gentle and Clifton, 2017), most existing research has focused on mentoring programs benefits for individual participants (Burke et al., 2006; Ragins and Kram, 2007; Eby et al., 2008; Jackevicius et al., 2014; Hagemeier et al., 2013; Fleming et al., 2015; Thomas et al., 2015).

The present work constitutes the first step to close this gap and aims to investigate whether the MediMent mentoring programs have potential benefits on the level of the organisation as well. We conducted a secondary analysis of existing survey data that was collected as part of the program's final evaluation. Specifically, we tested whether available program evaluations include statements that imply a potential for organisational. For example, such statements may refer to the acceleration of research- and hospital processes, networking, improvement of leadership culture, advancement of teaching quality, cross-generational discourse, or culture change and gender sensitisation.

In the remainder, we first introduce the two mentoring programs before we explain why we choose Senge's (Senge, 1992) framework of a learning organisation (LO) as a theoretical basis for our analyses. We then report methodological details and results from our survey analysis. Our analysis consists of two steps. First, *individual* benefits for mentees are summarised and retrospectively analysed with respect to potential *organisational* benefits. Second, these benefits are classified into different organisational learning disciplines to receive more detailed knowledge regarding the possible contributions of mentoring to faculty knowledge management. Finally, we summarise the identified organisational benefits of the mentoring programs, discuss the possible limitation of the current work, and point to its implications for future research.

The current work aims at directing the attention of faculty leaders and mentoring program managers to the overlooked connection between mentoring and LO.

## 2 Two mentoring structures

The MediMent programs at the Medical Faculty started as One-on-One mentoring for female postdocs in 2005. An additional Peer-Mentoring program for female and male postdocs was established in 2009. Both structures were implemented for faculty members.

In both programs, the exchange between participants from different hierarchical groups and within their own peer group may benefit their careers. Not only do the

structures and rules of academic life become more transparent to participants, the construction of a network also facilitates integration into the scientific community.

The mentoring programs were not initially created to improve the organisational development of the faculty. The support of equal opportunities for young female scientists was the initial priority. Over the course of 10 years, however, it has become obvious that the organisation also benefits from these programs.

In the following, we describe both mentoring structures (One-on-One and peer-mentoring) in detail (see also Petersen et al., 2012). Both programs satisfy the quality standards of the German Federal Association for Mentoring in Science (Wolf and Bertke, 2017).

### *2.1 MediMent One-on-One*

In the MediMent One-on-One program, female scientists are offered the opportunity to build a one-on-one mentoring relationship with a professor or a habilitated<sup>2</sup> faculty member of the Medical Faculty. The mentoring relationship is not hierarchically defined and is free from subordination (see Petersen et al., 2012). The special incentive of this form of human resource development is the unique relationship between mentee and mentor, which allows a free development of mentoring topics and is accompanied by the professional support program. Mentors help with access to scientific networks (Segermann-Peck, 1991), which is especially difficult for young women due to the hierarchical structures within the medical field (Petersen et al., 2012). In addition to the one-on-one mentoring relationships, interdisciplinary composed peer groups among the female scientists of the same program run are matched with one another (see Figure 1). Since this form of mentoring is used parallel to the one-on-one format, the networking aspect is especially emphasised: peer-mentoring means that the participants, as members of an interdisciplinary and non-competing group of four to five scientists at similar stages in their careers, discuss their future scientific careers with one another. Thus, a mutual support by colleagues and an exchange of experiences is enabled (Petersen and Sauerwein, 2010).

The mentees discuss selected topics in their individual conversations with their mentors. Through this, the mentees become more familiar with different perspectives on specific issues. The transfer of newly generated knowledge is further amplified by the simultaneous peer-mentoring. Figure 1 illustrates how each female scientist is matched twice in the programme sequence: with a mentor and with a peer group. The mentors are not part of the peer groups, but are only in touch with their own mentee.

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### *2.2 MediMent-Peer*

In this format, peer groups are formed in which no mentor is assigned to the entire group. This mentoring format gives participating women and men the opportunity of inviting mentors of their choice to the meetings who give advice and possibly accompany the group for a short period of time during the program. Each group consists of four to six participants, 50% women and 50% men. Professors and senior scientists in the Medical Faculty and university administration who wish to actively support young

medical academics can act as mentors. They give advice regarding their career strategy and impart their approved expertise. Figure 2 shows that one peer-mentoring group met 16 mentors during the program run-time of two years, whereby the visibility of each young medical academic in the faculty increased. A seminar and event schedule is part of each program run. Mentees participate in these seminars and events together with colleagues of their mentoring run. The overall structure of both MediMent programs is presented in Figure 3.

**Figure 1** Network example of MediMent One-on-One with additional peer groups during the same program run-time (see online version for colours)

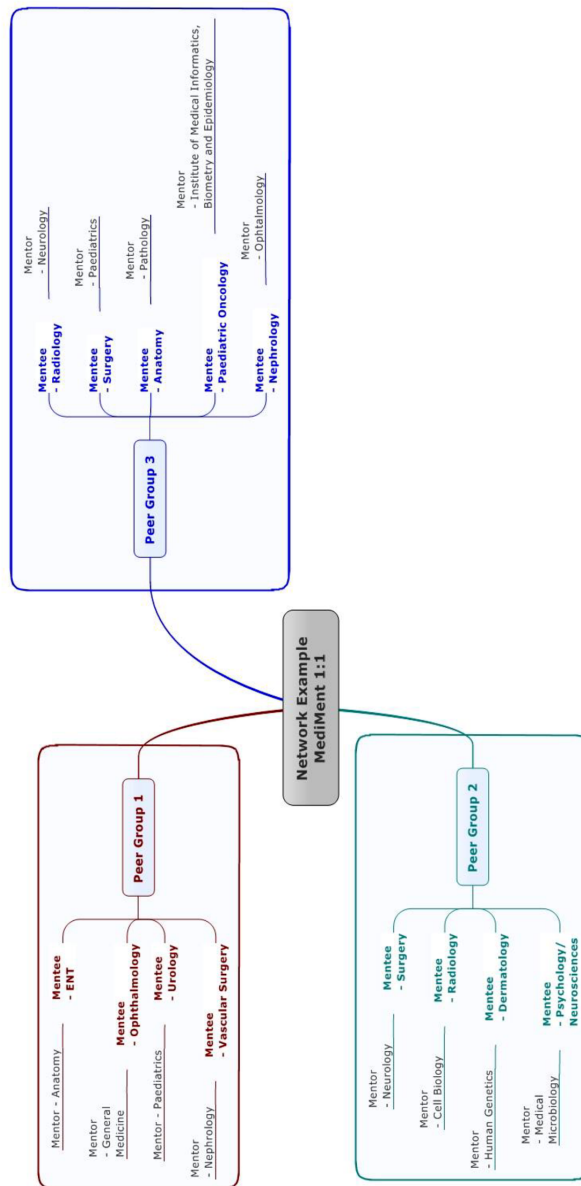
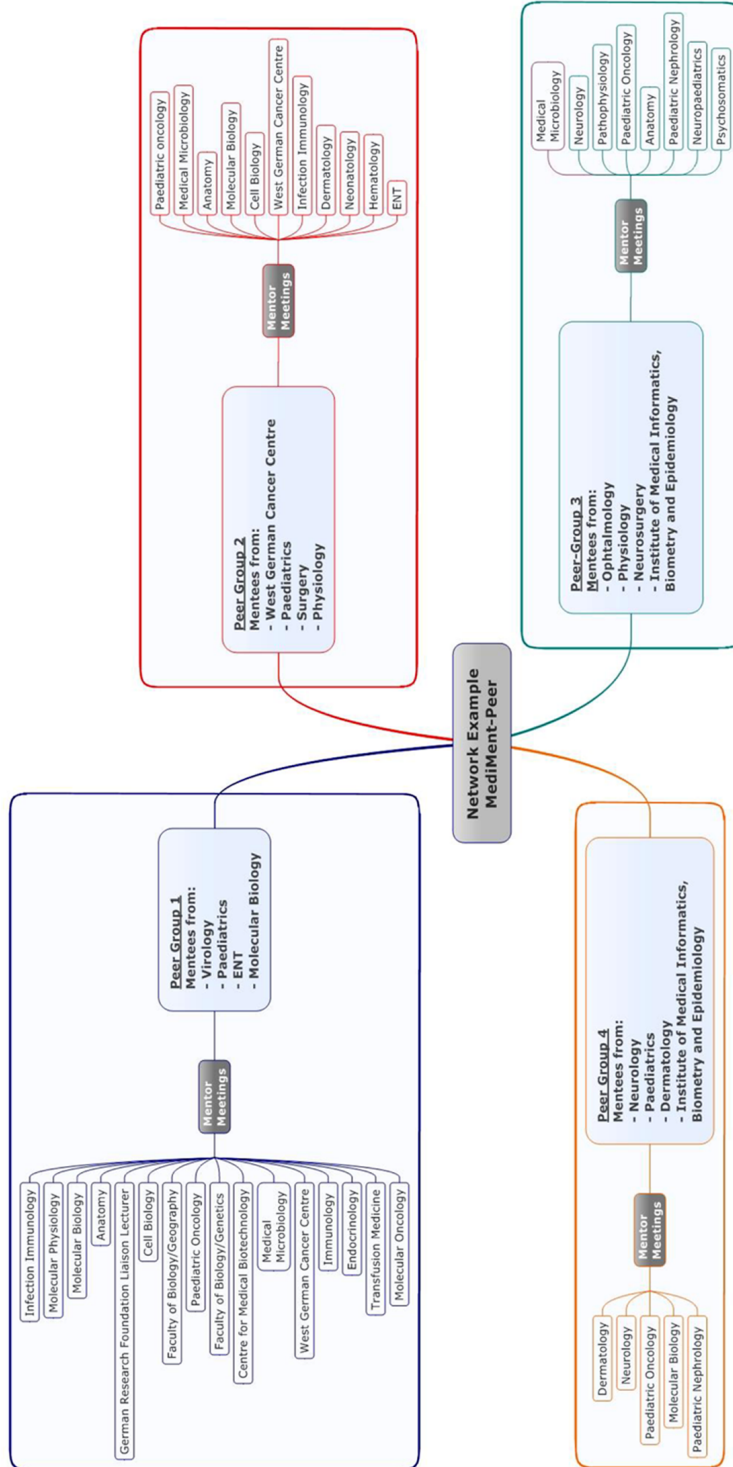
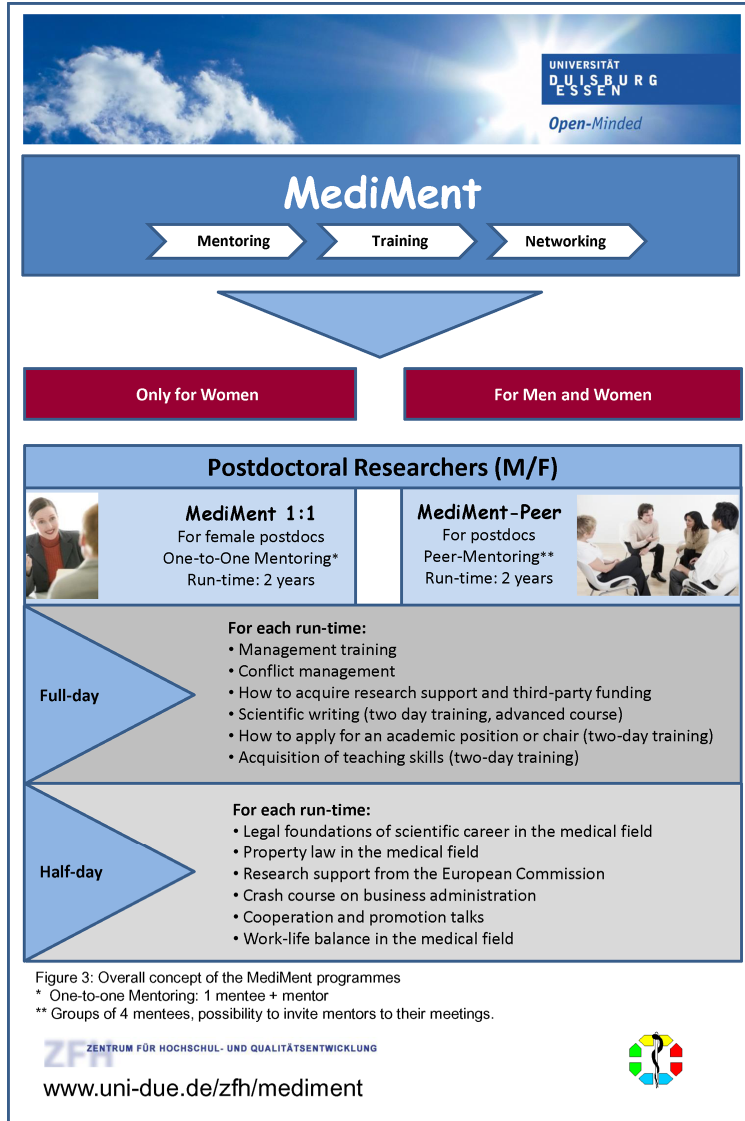


Figure 2 Network example of MediMent-Peer (see online version for colours)



**Figure 3** Overall concept of the MediMent programs (see online version for colours)



### 3 Learning organisation theory

Only recently, research has started addressing the question whether higher education institutions can be conceptualised as LO (see Reese, 2017 for an overview).

In 2005 when the program was initiated, organisational development was not among the intended outcomes of the program. The primary goal of the program was to support the career developments of young female scientists. However, benefits for organisational development have become apparent during personal discussions and written evaluations over the course of time.

In the present work, we sought a theoretical construct that allows to systematically identify organisational benefits from existing program evaluations and that defines organisational goals from a holistic perspective (e.g., humanitarian, cultural, economic, and visionary goals). There was no specific goal guideline regarding organisational benefits available within the faculty and top-down concepts for organisational development that focus on planned processes are not applicable in this case.

Organisational learning<sup>3</sup> as initiated by the mentoring programs refers to continuous learning which should satisfy the conditions of a 'learning organisation'<sup>4</sup> which are described in the following. More detailed discussions of existing definitions of organisational learning and ongoing debates can be found in Dee and Leisyte (2016).

As part of the mentoring programs, the *individual* needs for personal- and career development, as well as the *institutional* needs for systematic knowledge acquisition as a preparation for future managerial functions in the scientific field, are linked. The mentoring program as a format for personal development does not only improve participants' skills, but also provides them with the opportunity to professionalise their field of work. This idea is related to Macha's (2007) concept of, 'tacit knowledge', or implicit knowledge, which according to the author remains an unused resource as long as it is not brought to light by advanced training in discourse and thereby becomes apparent in the minds of employees and executives.

Due to the analytical division into five disciplines, Senge's (1992) concept is suitable for the present analysis which retrospectively looks at the different learning and communication present processes in mentoring and their potential contribution to the organisational development. In the following, we introduce this concept and describe how it is different from organisational development concepts that focus on strategically planned processes.

### 3.1 *Origins of learning organisation*

An important basis for the discussion about the LO was provided by Maturana and Varela (1987). At the beginning of the 1970s, both Chilean biologists dealt with the organisation of living systems. They considered living beings as autopoietic systems, which can reproduce themselves in a 'basal circularity'. Autopoietic systems reproduce the elements they are made of with the help of the elements they are made of. In their inner structure, which is essential for the regulation of reproduction, they have to be regarded as a closed system.

### 3.2 *Definition*

Senge (1992), as one of the leading scientists in this field, defines a learning organisation (LO) as an organisation which continuously extends its ability to design its own future and which is always in progress. The basis for this are the organisations' employees, organisations learn only through individuals who learn. Individual learning does not guarantee organisational learning. But without it, no organisational learning occurs (Senge, 1992).

According to Steinmann and Schreyögg (1999), learning organisations tend to be described as 'anti-structural', implying that they should be organisations which break free from the controlling element of the organisational structure and which prepare for a



permanent change instead. Verbal communication and hierarchy-free networking at one's own discretion should take the place of strictly structural regulation.

In contrast, Beckhard (1969) considers organisational development strategically as "an effort (1) planned, (2) organisation-wide, and (3) managed from the top, to (4) increase organisation effectiveness and health through (5) planned interventions in the organisation's 'processes', using behavioural-science knowledge" (Beckhard, 1969, p.9).

Burke also emphasises organisational development as "a planned process of change in an organisation's culture through the utilisation of behavioural science technology, research and theory" (Burke, 1977, p.10).

Senge's concept of the LO relies on an *endogenous* explication of organisational change and distinguishes itself from the theoretical concepts of "structured organisational development management from the top" or "planned processes of change". Thus, organisations can learn by their own means from their experiences and reveal new options for operation and decision-making. Senge describes the LO as a 'vision', as a direction, in which an organisation should develop and he identified several dimensions of personal developmental that also increase organisational effectiveness (Lewis et al., 2008).

Senge (1992) identified five different disciplines that have to be fostered in order to master the challenges of upcoming organisational modifications. These following five domains can be considered as design recommendations in the form of action-guiding ideas.

- Personal mastery

Personal mastery is a set of specific principles and practices that enable a person to learn, create a personal vision, and view the world objectively.

Employees should be encouraged to continuously strive for the advancement of their own competences. An institutional culture, which explicitly invites this kind of behaviour, is required. The absolute voluntariness of participation in personnel development offerings, which should explicitly support the entire personality, is essential. Through continuous self-improvement of the employees of an organisation, their competences are improved by mental models.

- Mental models

Here the question is how do we perceive the world around us? The constructivist approach, that the counterpart has another image of reality to that of oneself, is taken as a basis. Unexpressed individual basic assumptions become transparent in order to be able to become the object of development. With this in mind, mental models are mental images of causes, coherences and procedures: "In a variety of ways, the mind creates inner representations that correspond to reality" (Yeo, 2005). Ideally, people should find structures in organisations, in which they enter into dialogue and can mutually develop new best possible mental models for every imaginable situation.

- Shared vision

Shared visions emerge when all members of an organisation understand and internalise common goals. Everyone conceives the purpose and his/her function to reach the common goal. It is important that the vision of the organisation matches with individual values and goals so that individuals bring their work performance and their knowledge into the organisation. Visions have an emotional component.

- Team learning

Team learning takes place when members of a group consider each other as equal dialogue partners and understand each other in inner relatedness. They enter into a dialogue and attempt to get beyond the borders of individual understanding. Hereby, the team becomes more than the sum of its members, because in dialogue, individuals gain insights that simply could not be achieved individually. Team learning is the synergistic advancement of individual knowledge and competences. The requirement for team learning is an appropriate ‘culture of knowledge’, that is an environment, in which mutual reflection and learning from experience are supported. Efficient teams become a “microcosm for learning throughout the organisation”.

- Systems thinking

The first four disciplines have to be linked systematically in a way that recognises complex organisational interactions. Senge uses the metaphor that “the forest and the trees” have to be considered at the same time. Communicative conditions, which enable personal exchange, are the basis for the initiation of these processes.

### *3.3 Application to mentoring*

Thus, it can be assumed that mentoring is about the contribution to a process of mutual systemic impact on individuals and systems. First, the change is addressed by the individual and his/her potential development. Then, organisational learning occurs through the personal learning processes of the individuals and is then returned to the organisation by various interaction processes and initiated actions (Poulsen, 2013).

In the medical science field, interdisciplinary cooperation creates a variety of different perspectives across the borders of institutional departmental structures and is considered to be one of the requirements for quality.

The MediMent programs are in-house offers, in which mentees, as well as mentors, are involved in the same organisation. Hereby, a common (mentoring-) space of experience is generated. In mentoring, organisational development processes are not strategically created.

## **4 Methodological approach**

Building on the theoretical concept of Senge, the following analysis aims at identifying the effects of mentoring on all five disciplines of an LO by means of a secondary analysis of program evaluations (see Diekmann, 2014; Medjedović, 2014).

### *4.1 Sample*

Data was taken from participant satisfaction surveys from seven programs from 2005 to 2015: four One-on-One programs containing only women (postdocs) and three Peer programs for women and men (postdocs). A total of 98 mentees participated in these programs, and we received completed evaluations from 67 mentees (68%).

#### 4.2 Instrument

The *primary* research featured a standardised online survey. Questionnaires with five-point Likert scales were used to measure participants' subjective assessment of the effectiveness of their participation, and their satisfaction with the individual program modules.

Mentees were asked various questions regarding the process of mentoring from their perspective as a mentee. They were also asked to evaluate the mentoring conversations (content, helpfulness of the answers), as well as the network activities and seminars.

SPSS was used for statistical analysis in final reports for MediMent '1:1' I – III; EvaSys was used for reports MediMent IV and MediMent-‘Peer’ I – III (detailed final reports: Petersen, 2007–2015).

Mentees and mentors were questioned at the end of each program.

#### 4.3 Procedure

The available final reports (Petersen, 2007–2015) provide the basis for this *secondary analysis*. The survey results were interpreted with a focus on the following novel questions:

How could the benefits for the mentees, listed by the following aspects of career advancements, simultaneously be a benefit for the organisation?

- individual image building/profiling
- practical recommendations
- acquiring field knowledge
- acquiring managerial skills
- discussing horizontal aspects of a scientific career
- networking.

How could the involved faculty members, in their role as mentors, contribute to the organisation's development?

The authors chose a three-step-process:

- 1 Selected aspects were extracted from the project evaluation, see Tables 1 and 2.
- 2 These aspects were proved interpretable regarding their organisational development potential, see Tables 3 and 4.
- 3 With the aid of the concept of the five disciplines as an LO, the results were fitted in this theoretical scheme. The aim was to receive indications whether mentoring, based on these criteria, was able to make a contribution for LO.

The following analysis does not consider potential challenges of the mentoring programs like non-ideal fits between mentor and mentee due to power gaps (Elmes and Smith, 2006). Instead, our goal is solely to identify potential positive effects for organisational development.

**Table 1** Selected items reflecting satisfaction

	Average ratings (m)				
	1-1.99	2-2.99	3-3.99	4-4.99	5
<i>Selected items: how satisfied are you with n = 67</i>					
<i>1. Thematic image/profiling</i>					
1.1 Deepening your own research perspective	Very satisfied (1)	2.4			Very dissatisfied (5)
<i>2. Practical recommendations</i>					
2.1 Support with career planning	Very satisfied (1)	2.1			Very dissatisfied (5)
2.2 Setting of personal goals	Very satisfied (1)	2.2			Very dissatisfied (5)
2.3 Common reflection on publication activity	Very satisfied (1)	2.5			Very dissatisfied (5)
2.4 Learning about new strategies and rules for passing the peer-review	Very satisfied (1)	2.7			Very dissatisfied (5)
<i>3. Field knowledge</i>					
3.1 Insight into the scientific community	Very satisfied (1)	2.4			Very dissatisfied (5)
3.2 Insight into scientific career paths and necessities	Very satisfied (1)	1.8			Very dissatisfied (5)
3.3 Insights into work processes and their organisation	Very satisfied (1)	2.5			Very dissatisfied (5)
<i>4. Managerial skills</i>					
4.1 Insights into working (time)organisation	Very satisfied (1)	2.3			Very dissatisfied (5)
4.2 New impulses regarding the improvement of management skills in relation to multiple needs of management, clinic, research, teaching	Very satisfied (1)	2.3			Very dissatisfied (5)
4.3 Insights in strategies for coping with conflicts	Very satisfied (1)	2.4			Very dissatisfied (5)
<i>5. Horizontal aspects of a scientific career</i>					
5.1 Insights into work-life-balance experiences	Very satisfied (1)	2.2			Very dissatisfied (5)
<i>6. Networking</i>					
6.1 Contact scientists from other medical fields	Very satisfied (1)	1.4			Very dissatisfied (5)
6.2 Increase of your own network within the scientific community	Very satisfied (1)	1.8			Very dissatisfied (5)

## 5 Results: from individual benefits to the profit of the organisation

In the following, we summarise the results regarding the mentor programs possible benefits for the organisation. In a next step, these effects are analysed in regards to their relation to the five disciplines of an LO (Senge, 1992). Finally, we try to answer the question how the level of knowledge of the Medical Faculty can be raised by the use of this personnel development measure.

### 5.1 Individual benefits for mentees: benefits for the organisation

Table 1 presents several remarks indicating that participants felt better prepared for their future scientific career. Table 2 presents a selection of mentee responses to questions regarding changes in their professional situation and the goals they had achieved during the program.

**Table 2** Changes in the professional situation and goals

<i>7. Changes in their professional situation and goals n = 67</i>	<i>No. of responses</i>	<i>% of the responses</i>
7.1 Presented own work at a conference	53	79
7.2 Published scientific work in a peer-reviewed journal	33	49
7.3 Launched own research project	38	57
7.4 Built a research cooperation with third parties	32	48
7.5 Received a scientific award	14	21

In Table 3, benefits for mentees have been extracted from Tables 1 and 2 and combined in clusters.

**Table 3** Juxtaposition of benefits for mentees and for the organisation

<i>Individual benefits for mentees (Petersen, 2007–2015)</i>	<i>Benefits for the organisation Subsequent interpretation of the survey results</i>
<i>Thematic image/profiling</i>	
To 1.1 in Table 1: Assistance in identifying the research potential and advice on contouring the scientific profile.	The emphasis on and the support for personal potentials serve the scientific advancement in the specific field.
<i>Practical recommendations</i>	
To 2.1, 2.2., 3.1., 3.2 in Table 1: Personal goal development and decision-making support.	Competent advice prevents wrong tracks and detours, and relieves post-doctoral supervisors.
To 2.3 and 2.4 in Table 1 and To 7.2 in Table 2: Support for the planning of scientific publications. Also: workshops on scientific writing.	Lower frequency of correction loops. Consulting needs, usually aimed at superiors, decrease. The publication frequency for the faculty is increased by competent, early applied advice.

**Table 3** Juxtaposition of benefits for mentees and for the organisation (continued)

<i>Individual benefits for mentees</i> (Petersen, 2007–2015)	<i>Benefits for the organisation</i> <i>Subsequent interpretation of the survey results</i>
<i>Practical recommendations</i>	
To 7.3 and 7.4 in Table 2: Consulting on an acquisition of third-party funds and strategies for research applications. Also: workshops on third-party funding.	Potentially higher application and grant approval frequency for the faculty.
<i>Field knowledge</i>	
To 3.2, 3.3 in Table 1 To 7.3 and 7.4 in Table 2 Acquisition of knowledge of designing scientific cooperation.	The barrier to aspire to participate in cooperation may be reduced by the knowledge of chances and opportunities of a scientific cooperation. Knowing the results of this kind of relationship reduces the probability of failure.
To 3.1 in Table 1 Information on assistance in faculty committees: membership where and why?	The faculty is interested in dedicated committee members who show a willingness to participate in academic co-management. Young academics who are well informed by mentoring about the structures, tasks and functions and know what to expect in the committee, are more inclined to participate in a committee.
To 1.1., 2.1., 2.2., 3.1 and 3.2. in Table 1 To 7.1 and 7.5 in Table 2 Preparation for habilitation and appointment.	Professional support reduces dropout rates on the way to habilitation/ professorship because young medical academics are supported and accompanied by competent consultancy from experienced mentors. The successful completion of excellent research projects strengthens scientific knowledge processes and enhances the prestige of the faculty.
<i>Managerial skills</i>	
To 3.3., 4.1, 4.2 in Table 1 Acquisition of knowledge about time and self-management.	In university medicine, smooth workflows are essential (e.g., in medical consultation). Employees who are self-organised efficiently contribute to current clinical and research activities. This acquired knowledge about academic self-management structures can improve work-group internal processes within the organisation.
To 4.1 and 4.2 in Table 1 Acquisition of team and project management competence. Also: workshops on management-training/ leadership skills	Research groups are subject to group dynamic processes. The knowledge gathered through mentoring about these as well as acquired conflict and project management skills can improve work-group internal processes within the organisation.

**Table 3** Juxtaposition of benefits for mentees and for the organisation (continued)

<i>Individual benefits for mentees</i> (Petersen, 2007–2015)	<i>Benefits for the organisation</i> <i>Subsequent interpretation of the survey results</i>
<i>Managerial skills</i>	
To 4.1., 4.2. and 4.3 in Table 1 Acquisition of conflict and leadership competence. Also: workshops on management-training/ leadership skills	In seminars and in an exchange with mentors, newly generated leadership competence often stands in contrast to experienced leadership behaviour.  Newly acquired action patterns can be practically tested by mentees in the function of working group leaders. It can be expected that they have a positive effect on the leadership culture of the respective clinical or institutional division.
<i>Subject-related didactical knowledge</i>	
(Was not included in the questionnaire) A certificate course “Acquisition of teaching skills” is offered in the mentoring program (to fulfil the regulations for habilitation on the one hand; furthermore, a teaching portfolio is also helpful as a supplement to the personal application profile for a professorship).	The quality of teaching at the faculty is improved by the acquisition of professional didactic methods.  Increasing media competence: an example of this is a joint e-learning project by a mentee and her mentor, who received a prize for their work.
<i>Horizontal aspects of a scientific career</i>	
To 5.1 in Table 1 Opportunity for an exchange on the topic of work-life balance in the medical field.	Satisfied employees, who create a good balance in their working and professional lives are of particular value for the institution.  They have a positive effect on their work environment.
To 3.1., 3.2 and 4.3 in Table 1 Learning how to deal with competitors. Also: workshops on conflict management.	Competition is often regarded as a burden and can have a blocking effect on the performance. A learned de-escalating handling of this can calm the working atmosphere.
<i>Networking</i>	
To 4.1 and 4.2 in Table 1 Support for establishing scientific contacts and getting to know networking rules.	Communication lines in everyday hospital life are strengthened by personal contacts (for example in consultation service).  Potentially, additional cooperation and, in the ideal case, joint third-party funds applications with members of the faculty or peers emerge.

### 5.2 Individual benefits for mentors: benefits for the organisation

Participating mentors reported that they profited from exchanging interdisciplinary knowledge and experience with their mentees. Mentors also indicated that the MediMent program helped them to increase their own contacts and prompted reflection on their own leadership experiences and personal careers. By interacting freely with their mentees, mentors gained new insights into the situation of young (female) medical academics (Petersen et al., 2012).

Benefits for mentors and their effects on the organisation are discussed in the following.

**Table 4** Juxtaposition of benefits for mentors and for the organisation

<i>Individual benefits for mentors (Petersen, 2007–2015)</i>	<i>Benefits for the organisation Subsequent interpretation of the survey results</i>
The pleasure to pass on knowledge/to be a role model and to actively support young academics.	Active involvement of the faculty members in supporting young scientists. Consultations provided by mentors are cost-neutral for the institution.
Reflection of one's own values.	Discourse between the generations is selectively encouraged in the faculty.
Development of a better understanding of the younger generation by a change of perspective.	A change of perspective is facilitated by the (approximately) hierarchy-free interaction with the mentees.  Hereby, additional knowledge can emerge, which is then communicatively fed back to the institution.
Mentors enlarge their network.	Because of the interdisciplinary orientation of the program, there is the possibility to gain insights into issues and structures of medical fields that have not received too much notice of so far.
A network of mentors emerges.	Contacts, which are (initially!) unsubstantiated but which promise development potential, occur through the common ground of being a mentor.
Male mentors get to know more about career barriers for women by the personal exchange.	This can intensify the understanding of gender problems. In the role of a hierarchical superior, they can introduce this new knowledge into their fields of work.

## 6 Combining mentoring and learning organisation

The practical benefits for the faculty have been presented in the previous section. On the basis of the analytical separation according to Senge (1992), the following part discusses how the approach for a mentoring program affects the five disciplines of an LO mentioned above.

- Personal mastery

The university provides young academics with a supporting environment for further career development and for the systematic acquisition of scientific key competences by the offer to participate in the MediMent programs. The participation is voluntary. They express the explicit wish for personal development by submitting their application.

In a mutually appreciative environment with professionals of the same status and (nearly) hierarchy-free acting mentors, it is easier to develop personal (career) visions. Promotion goals, which were unspecific at the beginning of the program, become more



specific due to the exchange with others and often end in scientific peak performance such as the completion of the habilitation.

In the mentoring program, learning takes place in different ways: by intensive interaction with mentors, other mentees, and in workshops. Participants have the possibility to discover concealed assumptions and to extend their personal skills. The newly acquired knowledge is brought to the organisation through feedback and serves its further development.

- Mental models

In mentoring, the perceived reality of one's own scientific field is discussed with mentors, other mentees, and in seminars. Existing "inner images" are communicated and critically reflected in the exchange. It can be assumed that a collective reflection of institutional processes always takes place when it comes to an irritation of experienced actions and thinking schemes through the personal exchange (Schlüter and Berkels, 2014). Mental models are now visible as new knowledge and can become an object of (organisational) development processes.

- Shared vision

Researchers in university medicine share the goal to promote the cure of diseases as a common vision: "I want that only 20 % of patients die of this particular tumour disease when I retire. Today, it is 80 %", is how a participant described her personal vision that she shared with others. Mentees want to do research and publish and also support their individual careers together.

Another shared vision is the ability to balance work and private life. The next generation of researchers is looking for a compatible model that allows the simultaneity of work and family life.

By exchanging with other participants of the program, the mentees learn about the structures and rules of their scientific field and recognise how far these interlock to achieve the respective goal (Rekha and Ganesh, 2012). They want to guide the institution towards success through their active participation in (research, clinic and teaching) activities and realise that they as individuals can have an impact on the change of the whole.

- Team learning

The joint planning of the academic career in interdisciplinary and non-competitively organised peer groups generates an inner attachment. The emotional dimension is emphasised: "We're all in the same boat and support each other on the way towards achieving our goals." They experience themselves as equal conversation partners 'at eye level' in a traditionally hierarchical work field. They achieve career and research goals on the basis of the commonly shared vision. They are driven by the trust that they are understood in a communicative exchange.

This very personal experience sets standards for the requirement of future working processes in the team. The participants can acquire a pattern of common basic premises, which is demonstrated in managing their next career steps and the joint search for solutions to conflicts in the context of their activity in clinic and research. "That has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems" (Schein, 1985, p.6).

- Systems thinking

The complete system in interdependence with its mechanisms of action is observed and analysed amongst the participants in mentoring through the knowledge circulation between the generations as well as the exchange across disciplines, status levels and functional areas. However, one might suspect that the controlling capability of the organisation can only be increased through a better insight into systemic relationships. Individual insight does not transform into better organisational processes alone. However, members of the faculty have the opportunity to pass on new knowledge through the faculty council or other committees in the organisational discourse.

## **7 Limitations and discussion**

Currently, it is not possible to present a final impact analysis of the organisational effects of mentoring. With the available resources, it is not possible to conduct a more expensive and time-consuming study. The first indications for organisational benefits identified in the present work can be transformed into hypotheses that should be tested by future research. Potentially fruitful is a mixed methods approach (e.g., interviews with members of different status groups, documents and surveys) which facilitates a deeper understanding of the mentoring impact. Several authors have provided ideas on the theoretical foundations and empirical measurement of organisational learning which could inform future studies.

For example, Strandli Portfelt (2006) introduced a theoretical model that construed the university as a learning organisation. In one case study, the university was divided into several subsystems before method triangulation was applied. Argyris and Schön (1978) on the other hand, focused primarily on the quality of learning and learning outcomes in organisations. In addition, Bak (2012) investigated a department of a higher education institution regarding Senge's five characteristics of learning organisations. Some authors have introduced questionnaires to measure characteristics of a learning organisation that may be implemented in future research (Watkins and Marsick, 1997; Yang et al., 1998; McKenna, 1999; Arunprasad, 2015).

However, the general challenge in testing possible determinants of organisational learning is that it is difficult to draw causal conclusions. Organisations such as universities are always in a process of development and implementing controlled experimental research designs is seldom possible.

Nevertheless, the current analysis shows that mentoring programs can contribute to the development of the organisation and its 'self-renewing capacity' (Beer, 2009). They support the realisation of knowledge resources through mutually appreciative learning from and with one another in a non-competitive environment. The strategic benefit of this format of promoting young academics can also be seen in the positive effects on networking and on the communication culture in the medical faculty. Networking, in particular, has been shown to be beneficial for the social capital (Bourdieu, 1982) of higher education institutions (Akhtar et al., 2017).

Since the personal exchange between mentees and mentors is on a non-hierarchical<sup>5</sup> basis, new knowledge can develop which is inaccessible in formally advanced training formats. In their role as members of the faculty, all involved mentors directly or indirectly take part in the leadership of the faculty through democratic discourse as

insiders of commissions or the faculty council. Consequently, new impulses can be directly discussed at the managerial level and thus the decision-making level.

The intensification of networking mobilises the unused competence of insiders involved in the faculty. Forward-looking projects and changes can develop. Furthermore, this exchange across status borders also helps to reduce social distance.

The opportunity to participate in a qualified personnel development program, to communicate inner images of experienced structures and rules, to share common visions and to experience positive teamwork, makes it possible to expect that job satisfaction will increase. A higher identification of young academics with their organisation may be implied. As a result, it is conceivable that dropouts in science are also significantly reduced.

The success of the program which is externally visible, leads to an improved image and also to a local advantage for the faculty. Hereby, the faculty promotes its attractiveness as a 'good' employer.

Furthermore, the organisation is made aware of issues of equal opportunities by addressing the topic of a gender perspective in the context of these programs. Referring to de Vries, "the findings suggest that a long-term mentoring program for women has the potential to be an effective organisational change intervention. In particular, men involved in that program increased their understanding and sensitivity regarding gendering processes in the workplace" (de Vries et al., 2006, p.573).

Through the intensive exchange in mentoring with people of higher status and peers, participants can "learn to see as systems thinkers see, who develop their own personal mastery, and who learn how to surface and restructure mental models collaboratively" (Senge, 1990, cited in Yeo, 2005, p.371).

Senge's theoretical framework allows operationalising the effects of organisational development which have arisen from the individual exchange in the process of mentoring, and enable a review. Hereby the discourse of mentoring is furthered. Senge's theory may be useful for following up the steps mentioned above.

Organisational learning within the framework of Senge's theory occurs as recourse to individual learning without prior strategic goal definition, which means it is endogenous. In this context, the following question arises: To what extent can the benefit for the scientific organisation be even more strengthened through mentoring? In the future, it is conceivable that mentoring could be included as an integrated element of an overarching and holistic organisational development concept after a prior goal definition. Newly generated (mentoring-)knowledge can be fed back into pre-structured channels in the organisation.

At this point, further research should be initiated to show additional findings of the impact of mentoring program participation on the organisational development. By means of these results, new organisational catalogues of learning targets could arise. For example, the strengthening of 'mental health' as a result of the social interaction (Ono et al., 2011) could be part of the discourse of mentoring. Experiences could be the subject of peer group or one-to-one discussions, for instance, how it is to feel overwhelmed with work or to be afraid of scientific challenges (Schwenk, 2015).

Finally, the question has to be addressed what is subsumed under 'success'. Does 'success' remain reduced to hard factors such as the acquisition of third-party funds, the increase of research activities and thereby the increase of publication frequency? On the basis of which criteria can culture change be measured? Organisational 'success' is always caused by various factors, and thus an agreed field

definition of its measurement is urgently needed. Senge's concept of the learning organisation may constitute a fruitful conceptual framework in that regard as it provides universities with a vision that combines organisational and humanitarian approaches.

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## Notes

<sup>1</sup>MediMent = abbreviation for Medizin-Mentoring (medicine mentoring)

<sup>2</sup>A German post-doctoral qualification necessary for becoming eligible for professorship

<sup>3</sup>The authors interpret organizational learning (OL) as cooperative learning within a social system.

<sup>4</sup>The learning organization (LO) refers to the formal institutional guidelines that enable continuous learning.

<sup>5</sup>This does not refer to the status difference (e.g., professor vs. postdoc) but to the fact that there is no professional dependency between mentor and mentee.