From feedback to action: Physicians’ teaching performance in residency training
van der Leeuw, R.M.

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Discussion
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Purpose of this thesis

The purpose of this thesis was to measure teaching performance of faculty and explain the role of residents’ feedback in improvement of faculty’s teaching performance. We started the introduction of this thesis with the overarching construct of professional performance in health care. As laid out in the introduction, professional performance entails the actions and processes related to the everyday work of professionals in carrying out their tasks whilst adhering to the values, behaviors and relation of professionals to the community that supports and justifies the trust of people in professionals working in health care.\textsuperscript{1-4} The changes in medicine and medical education stress the need to develop and maintain performance on a high level. In short, excellent performance of medical professionals relies heavily on self-regulation and lifelong learning. Feedback can be used as input to maintain and potentially enhance professional performance in one or more areas throughout a professional career.

We will first discuss our findings in light of current literature and practice to increase our understanding of the use of residents’ feedback for teaching performance improvement. We finish by discussing the strengths and limitations of this thesis, pointing out implications for practice and future research.

High quality residents’ feedback for teaching performance improvement

Faculty are very important in delivering high quality health care in a residency training setting. For example, faculty need to ensure adequate supervision, select patient cases suitable for residents’ training level and should allow residents extra time to perform an operation (Chapter 2). Faculty are not only expected to take a professional stance towards their own performance, they are also required to keep oversight of and provide direction for patient care activities carried out by residents.\textsuperscript{1, 5, 6} Changes in the organization, the context and the provision of residency training, such as the introduction of competency-based training and duty-hour reform, require continuous adaptation from faculty working in a residency training setting. As such, faculty should receive input to maintain or develop their teaching performance, for which the System for Evaluation of Teaching Qualities (SETQ) is an appropriate system. The SETQ yields reliable and valid feedback that also contains rich narrative feedback matching the level of teaching performance of faculty (Chapters 3 to 5). For developmental purposes, feedback is the starting point for deliberate practice and it provides the opportunity for lifelong learning. Furthermore, it fits with quality assurance and accountability requirements as set by the profession, the hospital and the law. The results of using residents’ feedback as input to support faculty’s teaching performance are promising and seem sustainable in residency training (Chapters 3 to 7). Faculty’s teaching performance improves in subsequent years in the perception of residents (Chapter 6). In addition, we identified two factors that positively influence teaching performance improvement: numerical feedback scores and narrative suggestions for improvement (Chapter 6).
Therefore, a systematic way of receiving feedback on one’s teaching performance will not only support faculty in their aim to train residents in delivering high quality patient care, it also presents the opportunity for residents to contribute to their own training. Although faculty play a key role in residency training, this should not be interpreted as if faculty are the only ones contributing to residents’ development into the best possible doctor. Evidently, residents have their own responsibility to act as active learners, which is vital to their progress and ultimate success in residency training. Nonetheless, faculty should ensure the safety of patients through their responsibility for supervision of residents. This stresses the importance of our finding that patient outcomes are influenced by the level of supervision provided by faculty (Chapter 2). Similarly, enhanced supervision of residents was associated with improved patient outcomes. Thus, faculty’s teaching performance is not only important for residents’ learning but also for providing high quality patient care.

Evidence-based teaching performance measurement for faculty

When it comes to providing faculty with feedback on their teaching performance in residency training, residents, as the recipients of training, have the best insight in faculty’s teaching performance. The close relationship between faculty and residents in providing patient care in a training setting makes the SETQ feasible in residency training. In addition to the measurement instruments for obstetrics and gynecology that were evaluated as part of this thesis (chapter 3), other specialty specific instruments were also found to provide reliable and valid data on faculty teaching performance. This is important because measurement instruments should always be tested before applying them to other settings. There are many evaluation systems that lack rigorous testing. The instruments underlying the SETQ are evidence-based performance measurement instruments, used to gather high quality feedback data on teaching performance of faculty. This should not be taken as if the quality of the instruments is cast in stone. The value of continuously investigating the qualities of the measurement instruments and their implementation is stressed by the English National Health Service (NHS). The NHS formulated 20 lessons based on previously identified unintended consequences of performance measurement in healthcare. In line with modern ideas about rigorous instrument development, validation is a continuous process requiring careful re-evaluation when times, populations and settings change. The planned European launch of the SETQ system is a clear example of the necessity of exploring the psychometric qualities of the SETQ tools in other situations. Residency training in different health systems across Europe may imply that stakeholders (both faculty and residents) hold different views on learning needs and teacher requirements. For instance, concepts of teaching and teaching performance, beliefs about the impact of feedback on performance, and the familiarity with receiving feedback may differ among stakeholders. Many of the issues described above are currently being investigated.
Adding words to numbers: the value of residents’ narrative feedback

The SETQ instruments were developed to assess faculty’s teaching performance in a formative way.\(^\text{15}\) In a complete system, performance data collection is not restricted to numerical data. Within the SETQ, residents are invited to also provide narrative feedback comments. There is evidence from research in classroom teaching that narrative feedback is more effective than giving grades.\(^\text{16}\) Also in clinical practice, narrative feedback is used and much appreciated by learners.\(^\text{17-19}\) We were able to fill the void of knowledge on the frequency and determinants of narrative feedback –or written comments– in teaching evaluation of faculty in residency training. Research into the use of these evaluation instruments reported that residents were mostly engaged with teaching faculty performing at the extremes (both high and low).\(^\text{21}\) In Chapter 4, we also found evidence for peaks at the extremes; higher teaching performance was related to more positive comments. Additionally, the overall frequency of narrative comments per faculty was high. Faculty are thus provided with feedback that adds valuable information to the numerical feedback scores on their teaching performance (Chapter 4).

In order to be effective in steering performance, narrative feedback should be content relevant and specific. We found that the content of the narrative suggestions for improvement was primarily focused on faculty’s teaching skills and teaching attitude (Chapter 5). Thus, faculty are provided with written suggestions for improvement that could increase the value of the feedback through the added information on the direction for improvement. While residents seem engaged in providing suggestions for improvement, there is room for improvement in terms of increasing the level of specificity of these comments. This would increase its potential usefulness for faculty to guide possible teaching performance improvement efforts. Although the content and specificity of suggestions for improvement are hypothesized to influence performance improvement, there is no evidence yet that it actually enhances teaching performance.

From feedback to action: individual teaching performance improvement

From the previous studies regarding feedback on teaching performance, we learned that numerical feedback is valid and reliable and narrative feedback provides additional information for faculty to possibly use to improve their performance (Chapters 3 to 5). We found that feedback from residents predicts teaching performance improvement of faculty (Chapter 6). Aspects that influenced performance improvement were the numerical feedback score and the number of suggestions for improvement. Residents’ generosity in providing narrative feedback (Chapter 4) is therefore likely to pay off. Baker found that residents’ feedback resulted in clinical teaching improvement.\(^\text{22}\) It was noted previously that there is more going on between receiving feedback and changing one’s behavior in order to improve performance.\(^\text{17, 18}\) This thesis adds to the current literature on this topic by exploring and explaining the effect of residents’ feedback on teaching performance improvement. Our findings show that there is a complex interaction between different theoretical constructs that influence behavioral change. The processes of behavioral
change interact with feelings of self-efficacy and possible costs and benefits of change. This interaction explains faculty’s progression towards taking action upon receiving residents’ feedback (Chapter 7). What appears to be important in accepting and using feedback are the emotional reaction, clarity of the feedback content and search for outcomes.\textsuperscript{19} Looking more in-depth, factors influencing the responsiveness to feedback are on the interplay between fear, self-confidence and reasoning processes, which can increase and decrease receptivity.\textsuperscript{17} Potentially, all faculty can use feedback to inform them about their performance and to identify possible areas for improvement. Ultimately, improvement depends on the individual faculty and his or her use of feedback. Thus, the person receiving feedback should carefully evaluate the feedback and decide whether to put feedback into action, and if so, which feedback to use (Chapter 8).

**From feedback to action: system characteristics**

Positive comments and completing a self-evaluation did not predict teaching performance improvement. It may seem straightforward to conclude that these system characteristics are therefore not useful for faculty aiming to maintain or develop their teaching performance in residency training. This seems to be confirmed by Pelgrim and colleagues, who stated that the use of feedback in evaluation systems is determined more by the users than the system.\textsuperscript{23} However, the influence of system characteristics on individuals and their performance may be more complex. Although receiving compliments or praise appears to have little effect on stimulating performance improvement,\textsuperscript{16} positive feedback has shown to stimulate people to create positive goal-performance discrepancies by raising their goals following positive feedback.\textsuperscript{24} Positive comments in the SETQ might keep faculty motivated to also look at the suggestions for improvement. When looking at the influence of faculty who complete a self-evaluation of their teaching performance, the voluntary nature of participation in self-evaluation is possibly best kept that way. Our findings provide no scientific ground to make self-evaluation compulsory. On the other hand, self-evaluation should not be eliminated based on the study outcomes presented in chapter 6. There needs to be a better understanding of how self-evaluation might influence performance in order to make informed decisions on the in- or exclusion of a self-evaluation in a teaching evaluation system. In conclusion, a better understanding of the processes that determine performance improvement may enable increased use of feedback and the continuous development of systems to best support individual performance improvement.

**From feedback to action: contextual and organizational aspects**

In many residency training programs, using feedback to evaluate residents’ clinical performance is common practice. Also, the use of multi-source feedback to evaluate and support physicians’ clinical performance is a global development in health care.\textsuperscript{25, 26} This may have contributed to a climate where giving and receiving feedback on clinical performance is perceived as normal (or even good) practice. In line with these developments it seems that the familiarity with using feedback and evaluations for teaching performance
becomes common practice too. Research on faculty development could take on a more comprehensive viewpoint by broadening its scope to include contextual factors that may shape the success of faculty development. At the organizational level, leadership, the educational climate and the vision on and conceptualization of teaching performance are important aspects that could influence faculty’s (improvement of) teaching performance. In the Netherlands, political ideas to transform the provision of residency training into a more market driven format by linking financial incentives to the quality of training delivered, has increased the attention for quality and thus may have facilitated the introduction of performance systems. In other words, the importance of high quality residency training is something that was always implied, but has recently become more explicit. This could have resulted in increased support from residents and faculty for the idea that excellent teaching safeguards patient care and yields better patient outcomes in residency training (Chapter 2). This prepares residents for independent practice in the best possible way – something faculty vocalized as a motivation to use residents’ feedback for teaching performance improvement (Chapter 7). Furthermore, the clinical practice in which residency training is set is also based on being critical of the work you do. The worldwide modernization efforts to create competency based residency training programs explicitly focus on physicians’ role as a professional, which entails being reflective on one’s own performance. Overall, it is commonly accepted that it is important to give and receive feedback in residency training. The overall high response rates of residents’ evaluations of teaching faculty and faculty completing their self-evaluation (average of 84%) may both be an illustration and result of this notion.

**Strengths, limitations and opportunities**

In order to formulate implications for practice and future research (the opportunities), we will first discuss the strengths and possible limitations of the studies in this thesis that should be taken into account.

This PhD thesis is the first in a series of theses dealing with the various facets of the SETQ: its quality, its output, its practical use and its impact on the (quality of) residency training, trainers and the broader health care system. The collaboration in a multidisciplinary team of researchers, who are all familiar with and involved in the system under study, has contributed to the quality of this thesis. In addition and more specifically, the variation in research methods, the high response rates achieved in the SETQ evaluations both for residents and faculty, the multispecialty and multicenter study design and participation, and the relevance and practical value of this research are among the strengths of this thesis. The quantitative methods enabled us to draw conclusions about the psychometric quality of the SETQ instruments and investigate the predictive value of the feedback on subsequent performance (Chapters 3 and 6). Additionally, the qualitative design of and research methods used in the study on faculty’s proceeding after receiving feedback enabled us to
deepen our understanding in a way that would not have been possible if we would only have performed quantitative research (Chapter 7). For chapters 4 and 5, we combined these two approaches, starting with qualitative coding of the narrative feedback and then analyzing the data quantitatively so as to use the best of both worlds. The multispecialty and multicenter study population in most studies contributes to the generalization or transferability of our findings. All chapters include multiple specialties, except chapter 3 in which we purposively chose to focus on obstetrics and gynecology only, in order to investigate the qualities of the SETQ instruments for this specialty. Finally, because the recent changes in residency training are nothing short of a revolution, research into faculty’s teaching performance and the role of residents’ feedback is highly relevant. The practical implications of the research can therefore be valuable for faculty and residents who are amidst these turbulent changes.

Limitations should be considered when interpreting our findings to ensure a nuanced view of the implications for practice and research. In addressing the limitations of our research, we note that the limitations inherent to the methods and designs of the various studies are discussed in the individual chapters. In addition, we will discuss a few more general research limitations. First, the Dutch setting has typical cultural characteristics, which make that the findings may not be easily generalized or transferred to other countries. To explore these, and other, potential influences, research in other settings and countries is essential. Therefore, a project has been launched to introduce the (modernized) SETQ for anesthesiology departments in multiple European countries, for example the United Kingdom, Germany, Austria, Switzerland and Denmark. Second, we have not used control groups in our SETQ studies, limiting the possibility to investigate differences between participants and non-participants. Although SETQ contains measurement instruments that are ideal for evaluation of teaching performance, participation in evaluation is in itself an intervention making it impossible to evaluate teaching performance of a potential control group with SETQ. Using observations to investigate teaching performance may be a good solution and a method to triangulate the data, for example, on teaching performance improvement. Finally, the lack of information on non-responders is also a limitation. Although we have no insight in the non-responders, the generous participation of residents provides confidence that the feedback is representative of faculty’s teaching performance.

Implications for practice

What we have learned

This thesis was aimed at increasing our understanding of the use of feedback in teaching performance. What we have learned from this thesis is that valid and reliable feedback can be gathered and that feedback contains information on faculty’s areas for improvement. We now also better understand how faculty reflect upon residents’ feedback to change their performance and that repeated use of SETQ can identify new areas for improvement while evaluating the improvements that were made. Hodges and Kuper explored the use of theory
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in medical education and succinctly described ‘theory’ as a conceptual language to discuss the nature and use of aspects that may have been known implicitly. This thesis contributes to explicating the implicit nature and aspects of teaching performance in residency training and thus creates a language to discuss the use of feedback in professional performance of physicians in general. This adds to the theoretical knowledge on professional performance while providing practical strategies for use in residency training.

How to move forward with feedback on teaching performance

The way to move forward for faculty and residents would be to commit to the cyclical process of measuring, reflecting on and improving teaching performance. As shown in figure 1 of the introduction, the SETQ follows a cyclical pattern of gathering feedback on performance, identifying one’s teaching qualities and possible areas for improvement, reflecting on feedback and performance, initiating behavioral changes and evaluating the changes by restarting the same cycle. For residents, participation in the SETQ is a way to contribute to the quality of residency training and perhaps also offers a strategy to prepare for future practice as faculty, including lifelong learning. Furthermore, it would be an opportunity for faculty to monitor and possibly enhance their teaching performance since they contribute to the quality of residency training. They may also function as role models to residents by taking a professional stance towards receiving feedback as a means to maintain high performance. Ways to move forward would further be to focus on reflection on and action upon feedback. In addition, faculty and residents might communicate in a more direct manner about their expectations of residents’ learning and faculty’s teaching in order to align learning needs and teaching performance. The systematic way of giving and receiving feedback through an online system is likely to support the dialogue on teaching performance in residency training. Consequently, we anticipate continuous support for the evidence-based and systematic way of giving and receiving feedback on teaching performance of faculty in residency training. This is in line with the 2013 goals of the registration committee overseeing the specialists’ accreditation (RGS) as part of The Royal Dutch Medical Association (KNMG).

Faculty

Faculty who aim to maintain or improve their teaching performance should pay attention to gathering and using residents’ feedback. The narrative feedback provides individual insights in line with the numerical feedback score. Even more, attention should be paid to the suggestions for improvement as these are likely to influence teaching performance improvement and may provide clues for the areas of improvement. Since self-directed learning is an essential aspect of professional performance, we would recommend faculty to make the best use of their feedback. In taking feedback seriously and to get from feedback to action, the main focus will have to be on reflection; reflection on one’s emotions that may surface after receiving feedback, the goals one would like to achieve and the path towards these goals. However, receiving performance feedback with the intention to improve performance may result in a feeling that everything that is not ‘perfect’ is something that
needs to be improved. Boendermaker and colleagues identified this idea of a non-realistic view on teaching performance in general practice. They investigated the perception on general practitioners’ (GP) teaching qualities and found that the best GP trainer needs to hold qualities that are not likely to be incorporated in one person. Following two lines of thinking in competency development: one could either put effort in filling a gap or strengthen one’s qualities. Thus, there is always a choice and not every identified gap in performance needs to be improved, it merely needs to be addressed. Choosing not to adjust one’s performance, but to seek someone who is an expert can be a legitimate step. Finally, both our longitudinal study as well as the literature on audit and feedback of clinical practice suggest that participating in repeated evaluation is beneficial to the effect of feedback.

Residents
Residents could benefit from engaging in the evaluation of teaching performance of faculty if they see it as a chance to draw attention to the quality of their training and trainers; some aspects of which may not otherwise be addressed and may hinder their own learning. Since residents are also working in the tradition of professional performance and lifelong learning, making sure you get the best possible training through giving feedback to faculty may be considered normal practice for residents and should be supported by faculty. Furthermore, it could encourage residents to use feedback when they are practicing as faculty after they have finished their residency training. Participation in teaching performance evaluation through the SETQ could be perceived as an e-learning activity to practice how to give feedback. As a side effect, residents will become better informed about teaching qualities which may also be relevant for them when working with interns.

Narrative feedback and especially suggestions for improvement were identified as important aspects of the feedback for faculty’s teaching performance improvement. Although the effect of the content and specificity of narrative feedback on subsequent teaching performance improvement has not yet been confirmed, the assumption that this would increase the effectiveness of feedback is one reason to pay attention to the wording. Another reason is that careful phrasing of feedback is considered good professional practice and a way to help identify a peer’s strengths and possible areas for improvement. We found that there is room to improve the specificity of the phrasing, but we know that producing narratives is a more demanding task than numerically evaluating faculty’s performance on a Likert scale. In order to support residents, we could provide more guidance on the phrasing of the comments in the SETQ instruments. There is also evidence available with practical tips on how to give feedback effectively. These tips for providing written comments include: using neutral language, communicating expectations, basing feedback on observed behavior, giving positive feedback, and reflecting on one’s own feedback skills.
Implications for future research

Quality of measurement instruments
Continuous evaluation of the SETQ measurement instruments is vital to ensure effective feedback for teaching faculty. Therefore, validation will continue to be part of the future research agenda, including confirmatory factor analysis – to retest and refine the construct and validity of the SETQ instruments. In addition, SETQ instruments could be further enhanced through external validation using, for instance, data on the learning climate or from quality assurance instruments used during external peer review visits. The international use of SETQ in Europe will yield further studies to address the quality of the measurement instruments. It will also create the opportunity to gain more insight into contextual aspects that may influence teaching performance.

Narrative feedback
The promising findings of the use and effect of narrative feedback in teaching performance evaluation requires further attention. Suggestions for future research questions include: How does the specificity of feedback evolve and look over the years? How do residents perceive their ability to provide effective feedback? Are residents becoming more capable of providing effective feedback over subsequent years of participation? Does content or specificity of narratives matter in teaching performance improvement? In summary, residents’ reasons why to provide narrative feedback are less understood than their reasons why not. It would be interesting to focus on the positive drivers or motivating factors of residents to provide narrative feedback and the effect of content and specificity of narrative feedback characteristics on teaching performance improvement.

Reflection on feedback
Although we could increase our knowledge of how faculty react to and act upon feedback on their teaching performance, the reflection upon feedback is often regarded as the most valuable step towards action. Therefore, it would be interesting to further investigate the effect of reflection strategies on teaching performance. Possible research questions could be: How do faculty discuss and reflect upon the feedback received from residents on their teaching performance? How could faculty’s reflection on their (teaching) performance be supported? What is the influence of reflecting on feedback individually, peer-to-peer, resident-to-faculty, or within communities of practice on teaching performance?

Interaction between faculty and residents
The results of chapter 2 suggest that teaching performance is important in residency training. Yet, it is extremely unlikely that teaching performance alone could explain the variation in patient outcomes in residency training. The interaction between faculty and residents and the results in terms of patient outcomes could be influenced by, for example, the learning climate, contextual factors, (financial) resources or the organizational culture.
Building upon the basis of this thesis and other research, future research questions should focus on the interaction of faculty and residents: How do faculty and residents collaborate in residency training on the training part as well as delivered patient care? How do residents express their learning needs in daily practice and engage faculty into their learning goals? And how do they perceive faculty’s teaching performance in light of their learning needs? The possible answers to these questions may be found in the interface of interaction between residents as active learners and faculty as effective clinical teachers.

**Patient outcomes in future research**

To finish with a more general note for medical education researchers, there is still a lack of use of patient outcomes in medical education research. This is not only found in review studies, but also often addressed in editorials by experts in the field.\textsuperscript{46, 47} Little seems to have changed over the last decade as a review in 2001 showed similar results.\textsuperscript{47} For the research in this thesis, we underscore the difficulty of using patient outcomes. One reason is that little evidence existed on the use and effect of residents’ feedback on faculty’s teaching performance in residency training. We had to explore this subject first, while being explicit about the assumptions that might make our other studies valuable for patients. In general, patient care is teamwork and that makes it difficult to use patient outcomes as an outcome of individual health care professionals’ performance, let alone link these to specific aspects of residency training such as teaching performance of faculty. Therefore, the use of patient outcomes in a multidimensional and complex field such as professional performance in residency training setting may continue to be difficult. Perhaps, increasing our knowledge on the performance of physicians in their various roles such as teaching, patient care, research, and management could bridge the gap towards linking teaching performance and patient outcomes. Future research of the professional performance research group will surely explicitly address the link between teaching performance and patient outcomes. The work described in this thesis—laying out the first necessary steps by showing and explaining the impact of feedback on improvement—has contributed substantially to cross the bridge from training quality to patient outcomes. Finding evidence for the assumed positive relation between teaching and the quality of patient care has become a more realistic next step.
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