

THE CLINICAL TEACHER

Providing physicians with feedback on how they supervise students during patient contacts

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SUMMARY *In this descriptive study an instrument is presented that has been developed to provide physicians with feedback about their strengths and weaknesses in facilitating student learning during patient contacts. The instrument is strongly theory based, i.e. it is based on current general theories of context-bound learning environments, and forms of facilitation promoting transfer of knowledge to actual professional practice. In addition, it has been developed in cooperation with physicians supervising students during patient contacts. The authors have shown how physicians can be provided with individualized feedback on their performance in supervising students during patient contacts.*

Introduction

The cognitive apprenticeship model of learning is very old and has been extensively used in medical education for many years. In this model, students or novices are assumed to learn a domain-specific way of thinking and acting from experts while working in professional practice. Exposing students to a professionally relevant context is generally assumed to be preferable to a learning environment that is not context-bound (Billet, 1996). Such context-bound learning environments are assumed to promote the transfer of knowledge to real-life situations (Choi & Hannafin, 1995).

However, the problem with this highly context-bound and authentic learning environment is that it is primarily intended for patients' care, not students' learning. Students and residents tend to see a narrow range of patient problems in a single clinic and relatively few cases are discussed with attending physicians. When cases are discussed, the interactions are short in duration, focus on management and treatment options, involve little teaching, and provide virtually no feedback (Irby, 1995). Feedback and reflection are carried out infrequently in clinical settings and should be employed far more often than is done by most clinical teachers currently (Branch & Paranjape, 2002). The problem is that, although most physicians are expected to teach students, the majority of physicians have no formal teaching qualifications and often have had no instructions on how to teach (Dacre, 1998). It is more or less assumed that physicians as role models can provide the example to demonstrate what should be learned, and that students learn by imitation of the physicians they respect.

Role modelling is of course one of the most powerful means of transmitting values, attitudes and patterns of

thoughts and behaviour to students (Elzubeir & Rizk, 2001). However, it is important for physicians to define the role model from a student perspective (Harden & Crosby, 2000). This implies that the physician should effectively focus and pace the supervision to the student's level of learning. Supervision in practice settings is defined as the provision of monitoring, guidance and feedback on matters of personal, professional and educational development in the context of the physician's care of patients. Helpful supervisory behaviours include giving direct guidance on clinical work, linking theory and practice, joint problem solving and offering feedback, reassurance and role models. It can occur 'on the job', usually while a practical task is being carried out (Kilminster & Jolly, 2000). Thus, an individual focus for students' learning and immediate feedback are important principles of effective clinical learning (Rolfe & Sanson-Fisher, 2002). Feedback is the life-blood of learning (Rolfe & McPherson, 1995).

Faculty development initiatives to help physicians create a supportive environment for learning are highly necessary to help physicians become excellent supervisors of students (Irby, 1995). In faculty development programmes physicians learn how to create a supportive learning environment, e.g. by observing students at work with patients and giving feedback to students. In these programmes, physicians learn that they should fit their activities to students' learning needs and degree of self-directed learning. These programmes should therefore focus on teaching specific forms of facilitation. In addition, physicians should learn to reflect on the way in which they supervise students in order to stimulate professional growth of physicians in their role as supervisor.

Instruments providing physicians with feedback on their strengths and weaknesses in supervising students can help physicians to reflect on how they supervise students and could help physicians improve their teaching (Litzelman *et al.*, 1998; Copeland & Hewson, 2000). In the literature, at least two instruments were found for measuring effectiveness of physicians' teaching. One instrument was developed by the Cleveland Clinical Foundation, the so-called Cleveland Clinic's Clinical Teaching Effectiveness

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Instrument (Copeland & Hewson, 2000). The strengths of this instrument are: (1) it was developed in cooperation with many stakeholders which has given it broad-based support within the medical centre, and (2) it is tested and has proved to be valid and reliable. The weakness of this instrument is that it is not strongly theory based. The other instrument was developed at the Stanford University School of Medicine (Litzelman *et al.*, 1998). The strength of this instrument is that the construct validity was extensively investigated and that the instrument was proved to be valid. This Stanford instrument has, however, the same weakness as the Cleveland instrument, i.e. it is not strongly theory based. Both instruments are based on components of effective clinical teaching but *not* on current general theories of context-bound learning environments and forms of facilitation promoting transfer of knowledge to real professional practice. This characteristic of an instrument is extremely important because the real aim of collecting data with these kinds of instruments is to contribute towards theory development on effective learning in these highly authentic environments. The aim of this study is to demonstrate the development process of an instrument to provide physicians with individualized feedback on their performance in supervising students during patient contacts.

Five forms of facilitation for supervising students during patient contacts

In context-bound learning environments, facilitation should be provided to students to help them internalize learning and develop self-monitoring skills. Students should be provided with support to facilitate personal constructions of meaning about the world they experience. In context-bound (sometimes called situated-) learning environments, facilitation should take several forms: modelling, scaffolding, coaching, collaborating and fading (Choi & Hannafin, 1995). The ideal supervisor can deal adequately with all these forms and can use them in a flexible manner.

The first form is modelling. The aim of this form is that the student observes the expert and subsequently imitates him/her. Modelling is most effective when it occurs during task performance. The modelling focuses not only on physical processes but also on the thought processes underlying the performance, such as explaining why something is done in a particular way (Choi & Hannafin, 1995). Modelling can be done while a physician is carrying out a practical task. However, good modelling implies that physicians as teachers interact with students and share with students their thoughts as 'reflective practitioners', helping to illuminate for the students the process of thinking and acting, through demonstrating excellent reasoning skills and viewing the patient as a whole (Harden & Crosby, 2000).

The second form is scaffolding. The idea behind this form is that the student is stimulated by the physician towards performances that would have not been reached without the help of the supervisor. Scaffolds are needed when cognitive structures are incomplete or unstable. Scaffolding supports and simplifies a task as much as necessary to enable the student to accomplish otherwise impossible tasks (Choi & Hannafin, 1995).

The third form is coaching. This form involves observing and helping students while they attempt to learn or perform

a task. It includes providing feedback (Choi & Hannafin, 1995). The physician should observe and give feedback to the student at work with patients.

The fourth form is collaborating. Collaboration is inherent in everyday interaction. Students interact with other persons, patients and physicians, and exchange ideas and belief systems (Choi & Hannafin, 1995).

The fifth form is fading. Over time, the support that is given to the student and the novice must be gradually reduced (Choi & Hannafin, 1995). In the end, the student has learnt to work independently, is able to reflect on his/her own strengths and weaknesses and is able to regulate his/her own learning. The supervision that is given to a student is reduced until the student is able to regulate his/her own learning through reflection on experiences in practice. The student learns from interactions with patients and other physicians through critical reflections on daily practice.

These five forms represent a continuum from more physician-directed supervision to less physician-directed supervision and more self-regulatory behaviour. Physicians should be able to deal flexibly with these different forms and should be able to match them to the student's needs and level of self-regulation. These five forms of facilitation were used to develop an instrument to provide physicians with individualized feedback on their performance in supervising students during patient contacts.

Method

Subjects

This descriptive study was undertaken in Maastricht, The Netherlands. Medical students do their clinical rotations in years five and six in different hospitals in the region in which they attend the inpatient ward as well as the outpatient clinics. This study was conducted in one discipline within one hospital: the paediatrics department of the academic hospital in Maastricht.

In total 13 paediatricians were involved in this study. These 13 paediatricians were evaluated by at least six students involved in their fifth or sixth year. The number of students per paediatrician varied between six and 14.

Instrument

An instrument was developed to provide physicians with feedback on their performance in supervising students during patient contacts. The items were derived from the earlier mentioned forms of facilitation: modelling, scaffolding, coaching, collaborating and fading (Choi & Hannafin, 1995). All paediatrics physicians in Maastricht who work with medical students during the paediatrics rotations received a list of 15 items specifying behavioural characteristics that characterize the five forms of facilitation. The physicians were asked to rate whether each item was assumed to be relevant for a physician's performance in supervising students during patient contacts on a scale from 1 to 5 (1 = completely irrelevant, 5 = relevant). Furthermore, they were asked to indicate whether each item was clearly stated. All statements were evaluated as relevant (4 on a five-point scale or higher) by 10 physicians who responded. Nevertheless there were some comments on the wording of the items, which resulted

in reformulating several statements. In the end, the final instrument contained 15 statements underlying the different forms of facilitation with a five-point scale (1 = completely disagree, 5 = fully agree). An example of a statement that deals with modelling is “the physician showed me how to conduct a physical examination”. Furthermore, overall judgement was included in the final instrument in which students are asked to rate the performance of the physicians in supervising students (scale ranging from 1–10, 6 is ‘sufficient’, 10 is excellent) (question 16). Finally, two open-ended questions were included in which students were asked to give suggestions for improvement (questions 17 and 18). The items of the instrument and the underlying forms of facilitation are given in Appendix 1. Students involved in the paediatrics rotation of the hospital in Maastricht were asked to evaluate the physician’s performance in supervising students at the end of the rotation using the instrument described above.

Results

The data for this study were collected in a paediatrics rotation within one hospital. Respondents were fifth- and sixth-year medical students. In total 13 paediatricians were evaluated by at least six students. The data collected with the instrument presented in this paper will in the future be used to provide physicians with feedback on their performance in supervising students during patient contacts (see Appendix 2). The feedback contains information at the level of individual items clustered around the forms of facilitation (role modelling, scaffolding, coaching, collaborating and fading). The mean score is given per item, with the corresponding standard deviation and the number of students filling out that item. Furthermore, plus and minus scores are given to mean scores, for items scoring respectively high or low. A plus score is given if the average score is above 4, on a scale of 1–5. A minus score is given if the average score is below 3. A minus score indicates which

aspects need improvement. In addition, tips are given as suggestions for improvement.

A profile can be made (see Figure 1) to illustrate strong and weak aspects of the performances of an individual physician. Average scores of an individual physician, based on the ratings of seven students (Appendix 2), on each of the items of the instrument are depicted as bars. The average scores per question of all 13 paediatricians involved in this study are depicted as a line. The profile demonstrates the relative position of this physician in relation to other physicians. As can be seen in Figure 1, the paediatrician scores relatively low and even below the cut-off score (3 on a scale of 1–5) on three items (numbers 8, 9 and 10) related to coaching. This implies that this physician does not often observe students or give feedback after observations. In addition, the physician does not often ask questions that encourage learning. Students’ answers to the open-ended questions illustrate these shortcomings; i.e. the physician is recommended to take more time to observe students.

The profile also demonstrates the relative strengths and weaknesses of all 13 paediatricians regarding the five forms of facilitation, depicted as a line. As can be seen in Figure 1, all items related to coaching, collaborating and fading (items 8–15) score relatively low, i.e. just above or below 3.0, except for item 11. Item 11 deals with giving explanations and answering questions. The relatively high score on this item indicates that physicians in general are willing to give explanations. However, observing students (items 8 and 9), asking for questions promoting learning, asking for conclusions and arguments (items 10, 12 and 13), and stimulating to work independently (14 and 15), are not often perceived by students as being conducted by their physicians as supervisors. This implies that these physicians are not yet able to focus and pace their supervision to the students’ level of self-regulation and are not yet able to deal with all forms of facilitation in a flexible manner. These findings provide us with directions for training of physicians and faculty development programmes.

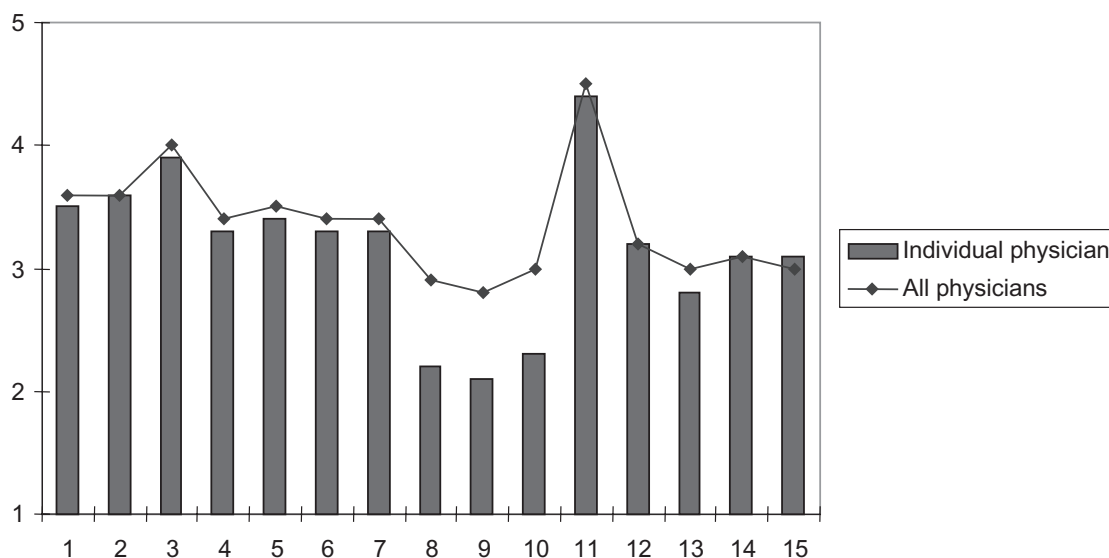


Figure 1. Profile of a physician’s supervising performance.

Note: Average scores (scale 1–5) per question (1–15) of an individual physician are depicted as bars. The average scores per question of all physicians are depicted as a line.

In the future, the feedback form will be sent not only to each individual physician but also to the chair of the department in which the physician is working and the office of the dean of education. Providing physicians with feedback on their performance in supervising students during patient contacts can be used not only for improvement purposes but also for accountability purposes, i.e. it may be used in the reward system to assess a physician's teaching performance. The department chair can file the information to be used in annual review sessions with the physician. The dean's office can keep a record of all data collected from different physicians over the years. The record can be consulted when promotion decisions are being made. If a physician has an insufficient overall score (question 16, score below 6, scale 1–10), one of the members of the dean's office can contact the physician concerned to find out what went wrong. The dean of education can ask the chair of the department, during annual review sessions in which the performance of all physicians within a particular department is discussed, to indicate what actions will be undertaken to improve the physician's behaviour. Actions that can be undertaken require the physician to consult the teacher trainer for training. Furthermore, scores of all physicians within a specific discipline can be used to indicate strong and weak aspects in a physician's teaching performance and provide directions for faculty development programmes.

Conclusion and discussion

In context-bound learning environments, different forms of facilitation should be provided to students to promote transformation of knowledge into actual professional practice. Facilitating student learning in real professional practice where students are involved with patients requires more than imitating physicians as role models. Physicians should use several forms of facilitation to focus and pace their supervision to the student's level of self-regulation. In addition, physicians should be provided with feedback on strong and weak aspects of their performance in supervising students. In this descriptive study, an instrument is presented that has been developed for this purpose. In addition, we have shown how physicians can be given individualized feedback on their performance.

The strengths of the instrument presented here are:

- (1) it is strongly theory based, i.e. it is based on current general theories of situated learning environments and forms of facilitation promoting transfer of knowledge. It is therefore potentially able to contribute towards theory development on effective learning in these highly authentic environments;
- (2) it has been developed in cooperation with physicians supervising students during patient contacts. Thus we have had support from the medical staff that may contribute towards the acceptance and usability of the instrument.

Because the instrument is based on general theories of situated learning environments, it is generic and can therefore be used in different disciplines throughout the institution. The data collected provide directions for faculty development and may be used to design training programmes fitted to physicians' needs. However, more data need to be collected

within different disciplines and studies need to be conducted to test the instrument's validity and reliability. Finally, further research is needed to find out whether the feedback presented to the physicians does indeed stimulate physicians to reflect on the different forms of facilitation they use when supervising students during patient contacts, and also whether this subsequently results in improving their supervision.

Practice points

- Physicians should focus and pace their supervision to the student's level of self-regulation, and should be able to deal with several forms of facilitation in a flexible manner.
- Instruments providing physicians with individualized feedback on their strengths and weaknesses in supervising students can help them improve their teaching.
- These instruments need to be based on current general theories of context-bound learning environments and different forms of facilitation promoting transfer of knowledge in order to ensure that they can contribute to further theory development in this area.
- In addition, these instruments need to be developed in cooperation with physicians supervising students to enable acceptance and usability.

Acknowledgement

The authors would like to thank Dr K. Byatt of Hereford, UK for his comments on an earlier version of the text of this manuscript.

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Appendix 1: Questionnaire to provide physicians with feedback on how they supervise students during patient contacts, developed at the Maastricht Medical School, The Netherlands

	1 = disagree, 5 = agree					
Role modelling						
1. The physician showed me how to take the history	1	2	3	4	5	(15)
2. The physician showed me how to conduct a physical examination	1	2	3	4	5	(16)
3. The physician demonstrated good role-modelling behaviour	1	2	3	4	5	(17)
4. The physician explained to me why something was done in a specific way	1	2	3	4	5	(18)
Scaffolding						
5. The physician ensured a safe learning environment	1	2	3	4	5	(19)
6. The physician adjusted his/her facilitating activities to my level of experience/competence	1	2	3	4	5	(20)
7. The physician helped me to do activities that I could not have done without his/her help	1	2	3	4	5	(21)
Coaching						
8. The physician observed me regularly when I was taking a history or doing a physical examination	1	2	3	4	5	(22)
9. The physician gave me constructive feedback during or after observations	1	2	3	4	5	(23)
10. The physician asked me questions that were instructive or facilitated learning	1	2	3	4	5	(24)
Collaborating						
11. The physician was willing to give explanations and to answer questions	1	2	3	4	5	(25)
12. The physician asked for my conclusions based on my examination	1	2	3	4	5	(26)
13. The physician asked me to explain why I chose a particular way of working	1	2	3	4	5	(27)
Fading						
14. The physician encouraged me to conduct activities independently	1	2	3	4	5	(28)
15. The physician stimulated me to think about my about strengths and weaknesses needing further learning	1	2	3	4	5	(29)
Global qualification						
16. Give a mark between 1 and 10 for the overall performance of the physician as a supervisor 1 2 3 4 5 6 7 8 9 10						(30–31)
17. What did you like about the supervision?						
18. What advice would you give the physician to improve his/her supervision?						

Appendix 2: Feedback on how a physician supervises students during patient contacts

Name of physician: Rotation: Period:

	Mean (1–10)	SD	N
Global qualification for the quality of <i>your performance</i> as a supervisor	6.9	0.7	7
Global qualification of all physicians	7.7	0.4	13*

(continued)

Continued

	Mean (1–5)	SD	<i>n</i>	Strong/weak
<i>Role modelling</i>				
1. Demonstrating taking the history	3.5	0.6	7	
2. Demonstrating the physical examination	3.6	0.8	7	
3. Being a good role model	3.9	0.5	7	
4. Explaining why something was done	3.3	0.9	7	
<i>Scaffolding</i>				
5. Ensuring for a safe learning environment	3.4	0.8	7	
6. Adjusting facilitating activities to level of experience	3.3	0.7	7	
7. Facilitating activities that could not have been done without help	3.3	0.8	7	
<i>Coaching</i>				
8. Observing history and examination	2.2	0.9	7	–
9. Giving constructive feedback during observations	2.1	0.8	7	–
10. Asking questions that promote learning	2.3	0.7	7	–
<i>Collaborating</i>				
11. Giving explanations and answering questions	4.4	0.5	7	+
12. Asking for conclusions	3.2	0.7	7	
13. Asking for reasoning behind decisions	2.8	0.8	7	–
<i>Fading</i>				
14. Encouraging to work independently	3.1	0.8	7	
15. Encouraging to think about strengths/weaknesses	3.1	0.7	7	

What did you like about the supervision:

- Answering questions (2 ×)
- Giving a short explanation before the patient was seen

What advice would improve the physician's supervision:

- Take more time for observing student
- Ask the student for his/her opinion

SD = standard deviation, *n* = number of students, *n** = number of physicians/supervisors; strong aspects (+) = aspects scoring > 4, weak aspects (–) = aspects scoring < 3.