



Student teaching: views of student near-peer teachers and learners

Carolien Bulte, Aaron Betts, Kathryn Garner & Steven Durning

To cite this article: Carolien Bulte, Aaron Betts, Kathryn Garner & Steven Durning (2007) Student teaching: views of student near-peer teachers and learners, Medical Teacher, 29:6, 583-590, DOI: [10.1080/01421590701583824](https://doi.org/10.1080/01421590701583824)

To link to this article: <https://doi.org/10.1080/01421590701583824>



Published online: 03 Jul 2009.



[Submit your article to this journal](#)



Article views: 1541



[View related articles](#)



Citing articles: 102 [View citing articles](#)

Student teaching: views of student near-peer teachers and learners

CAROLIEN BULTE¹, AARON BETTS², KATHRYN GARNER² & STEVEN DURNING²

¹University Medical Centre Utrecht, the Netherlands, ²Uniformed Services University of the Health Sciences, USA

Abstract

Background: Since teaching is an important skill for future residency training and practice, training for this role should optimally be introduced as well as practiced in medical school. Studies have not fully explored the benefits and potential challenges of more senior medical students teaching more junior medical students. We define a near-peer as a trainee who is one or more years senior to another trainee on the same level of medical education training (i.e. medical students teaching other medical students, residents teaching other residents)

Aim: The aim of this study was to investigate the perceptions of medical students regarding near-peer teaching and near-peer learning and to identify relevant teacher roles for near-peer teachers at two institutions from two different countries.

Methods: The authors developed two questionnaires that were filled out by a convenience sample of students who have participated in near-peer teaching (as either learner or teacher). These questionnaires were distributed at the University Medical Centre Utrecht (UMC Utrecht), the Netherlands and the Uniformed Services University (USU), USA.

Results: The majority of near-peer learners and near-peer teachers from both sites identified information provider, role model, and facilitator as suitable roles for near-peer teachers. Both groups agreed that planner and resource developer may be less suitable roles for near-peer teachers.

Conclusion: Information provider, role model, facilitator appear to be appropriate roles for a near-peer teacher from the perspective of near-peer learners and teachers. Given the demands of future physicians to serve as educators for both junior physicians and patients, near-peer teaching during medical school appears to be an important curricular consideration.

Introduction

Medical schools are responsible for assuring that every graduating student has the requisite knowledge, skill, and professionalism to enter residency training. Indeed, 'doctor' in Latin means 'teacher', and one of the key activities of a physician is teaching. Physicians teach their patients about diagnoses and care plans. Physicians in training are also put in the role of teaching their junior colleagues such as residents teaching more junior residents and residents teaching medical students who are on their service or working with them in clinic.

Despite its universality, teaching is a skill for which physicians often receive little or no formal training during their medical school and residency training years. Initiatives such as the 'Residents as Teachers' are now attempting to address this need in graduate medical education (Edwards et al. 2002). Since teaching is an important skill for future residency training and practice, we believe that training for this role optimally should be introduced and practiced in medical school.

Near-peer teaching is the phenomenon whereby senior trainees (one or more years senior in training on the same level of the medical education spectrum) teach more junior trainees. Under this teaching modality, students are instructed by students who are one or more classes ahead of them

Practice points

- Teaching is an essential skill for physicians yet they often receive little or no formal teaching training.
- Near-peer teaching is the phenomenon whereby senior trainees teach more junior trainees.
- Medical student near-peer teachers and learners from two different countries identified strengths and weaknesses regarding near-peer teaching that are consistent with current theory.
- Given the demands of future physicians to serve as educators, near-peer teaching appears to be an important curricular consideration.

(the near-peers). Near-peer teaching has become an area of research with the introduction of problem based learning (PBL) and other small group teaching formats in medical schools worldwide. However, there have been few studies that have examined how near-peers view the teaching and learning experience.

Some theoretical frameworks support the potential use of near-peer teaching. The importance of cognitive congruence was demonstrated in a recent study by Lockspeiser and colleagues (Lockspeiser et al. 2006). This congruence theory

Correspondence: Carolien Bulte, UMC Utrecht, Oudenoord 347, 3513 EP Utrecht, the Netherlands. Tel: +31-(0)6 1991 2486; fax: +31-(0)30 250 3409; email: carolienbulte@gmail.com

argues that the near-peer teachers have a better understanding of the fund of knowledge, to include shortcomings of knowledge, of their more junior student colleagues, enabling them to better clarify problems at an appropriate level. Several studies involving near-peer teaching have demonstrated that social and cognitive congruence is important to the near-peer teaching relationship. Social congruence is an important factor that may influence group functioning and students' way of learning. Similarly, Schmidt et al. demonstrated the importance of social congruence, emphasizing that being able to communicate with students in an informal way coupled with an empathic attitude are important qualities of an effective tutor (Schmidt & Moust 1995). Over the past several years studies have compared the effectiveness of student-led versus faculty-led PBL tutorials. In these tutorials, the role of the tutor is to motivate the students to gather their own knowledge and to guide them in their learning. Thus, tutors should consider themselves as a 'facilitator' instead of a 'lecturer'. Most studies found comparable performances between groups tutored by faculty members and groups led by (near-) peers (Sobral 1994; Nnodim 1997; Kassab et al. 2005). However, these studies were limited by focusing mainly on performances by students subjected to same-level peer teaching, instead of near-peer teachers, which are one or more years senior to their learners.

Studies have also begun to investigate the advantages of near-peer teaching for the peer teachers. One study found that teaching junior students can have a positive effect on facilitation and communication skills of the senior medical students (Solomon & Crowe 2001). If this teaching modality can benefit both near-peer student learners and near-peer student teachers, should we consider offering near-peer teaching to all students?

Our institutions (Uniformed Services University or USU and University Medical Centre Utrecht), offer more senior medical students (by one or more class years) the opportunity to teach more junior medical students. At the University Medical Centre in Utrecht, the sixth year of medical school prepares students for specialization by developing competencies that are necessary as resident and specialist (Ten Cate 2007). One of the areas of competence extracted from the CanMEDS framework, the recently introduced format for Dutch postgraduate medical education, describes that all students must be aware of the general principles of medical education in Utrecht, which is partly based on PBL. Therefore, all sixth-year medical students must serve as a tutor to facilitate one tutorial for first or second year students. Preparation for this tutorial is comprised of a two-hour session on group dynamics led by faculty. The tutorials are led by two students. In these two-hour sessions each student serves a teacher for one hour and an observer for one hour. Afterwards there is a feedback session to give students an opportunity to share experiences. In addition, a six week elective teaching rotation is offered to sixth year students. At the Uniformed Services University, fourth-year students are offered the opportunity to participate in the teaching of some first and second year small group and laboratory exercises. Dutch

and US medical school systems differ. The Dutch 6th year and the US 4th year reflect the same stage, being the final year before graduation as a medical doctor.

The effectiveness of student-led tutorials versus faculty-led tutorials has been the subject of investigation. For example, Lochspeiser et al. studied the perspectives of the students on this type of education (Lochspeiser et al. 2006). However, one important limitation was that the students' experiences were based on a supplemental peer teaching program unique to their curriculum. A second limitation of this study and others is that the students were taught by other students of the same academic year (same-level peer teaching). At Utrecht and USU, students are being taught by students one or more years ahead of them (near-peer teachers) instead of same-level peer teaching.

Medical education has undergone many changes over the last decade. Therefore, it is necessary for teachers to consider new teaching roles. These roles imply differences in the intensity of contact with students and perhaps the requirements of the teacher. Of course, a teacher can have several roles, but some will have just one. In this study, we investigated the perceptions of the impact of near-peer student teaching in Holland and the United States, both from the standpoint of the near-peer teachers as well as their near-peer learners.

Methods

Survey instrument

Investigators from Utrecht and USU developed two surveys to assess student perceptions of near-peer teaching and learning, respectively (Figures 1 and 2). The items on the two surveys address the same areas of inquiry and differ only by the perspective of the participant (near-peer teacher or near-peer learner). The survey questions were developed based on the roles of the teacher described by Harden and Crosby and a review of the literature. They have identified twelve roles that can be grouped in six areas: information provider, role model, facilitator, assessor, planner and resource developer (Harden & Crosby 2000). Survey items included modified-Likert and free text queries. The questionnaires inquired about the type of near-peer teaching given, the suitability of roles for near-peer teachers, perceived effectiveness of this teaching as well as strengths and weaknesses of this teaching format. In the remainder of this paper, we will refer to the two surveys (Figures 1 and 2) as 'near-peer learner' and 'near-peer student teacher'. The Uniformed Services University (USU) IRB deemed the study exempt for USU participants, as was the case in Holland.

Study participants

Utrecht. All sixth year students who had followed a teaching rotation between October 2004 and December 2006 were asked to fill out the near-peer teacher survey. This survey was distributed in January 2007. Students were contacted by e-mail, because the majority had already graduated from medical school. To investigate the opinions of near-peer learners on

Figure 1. Near-peer learner survey.

Uniformed Services University. Students who have had the opportunity to participate as a near-peer teacher or learner were asked to complete the relevant survey. All surveys were sent electronically in March 2007 with nonresponders receiving an additional reminder to complete the survey. As not all USU students are exposed to either near-peer teaching and/or near-peer learning, these findings represent a convenience sample.

Results

Of the second year students at Utrecht who were asked to fill out a survey, 34% responded (77/226). The mean number of hours students say they received education from near-peers

In which types of teaching did you participate? (please tick)*

| | | |
|---|---|--|
| 1 | <input type="checkbox"/> Tutorials (small group teaching in preclinical courses such as SFOS) | |
| 2 | <input type="checkbox"/> Preceptor for history taking skills(ICM I) | |
| 3 | <input type="checkbox"/> Preceptor for physical examination (ICM II) | |
| 4 | <input type="checkbox"/> Lab classes / practicals | |
| 5 | <input type="checkbox"/> Lecturer of large classes | |
| 6 | <input type="checkbox"/> Other, please specify | |

| | | |
|----|--|--|
| 7 | For students of which curriculum year did you act as a near peer teacher (NPT)? | |
| 8 | In which curriculum year were you yourself at that time? | |
| 9 | Estimate the total number of hours you have actually taught fellow students. | |
| 10 | Estimate the total number of hours you have invested in preparing for all this teaching. | |

Which teacher roles have you executed as a near peer teacher? (please tick any)

| | | |
|----|--|--|
| 11 | <input type="checkbox"/> - <i>information provider</i> (lecturer, skills trainer) | |
| 12 | <input type="checkbox"/> - <i>role model</i> (demonstrator of behaviour as a teacher, scientist, clinician etcetera) | |
| 13 | <input type="checkbox"/> - <i>facilitator</i> (mentor, small group tutor or moderator) | |
| 14 | <input type="checkbox"/> - <i>assessor</i> (evaluator of students or their work) | |
| 16 | <input type="checkbox"/> - <i>planner</i> (curriculum planner, making schedules, designing education) | |
| 17 | <input type="checkbox"/> - <i>resource developer</i> (writer of study guide, writer of study texts) | |

Which roles do you consider suitable for a NPT? Not Neutral Very

| | | | | | | |
|----|-----------------------------|---|---|---|---|---|
| 18 | <i>Information provider</i> | 1 | 2 | 3 | 4 | 5 |
| 19 | <i>Role model</i> | 1 | 2 | 3 | 4 | 5 |
| 20 | <i>Facilitator</i> | 1 | 2 | 3 | 4 | 5 |
| 21 | <i>Assessor</i> | 1 | 2 | 3 | 4 | 5 |
| 22 | <i>Planner</i> | 1 | 2 | 3 | 4 | 5 |
| 23 | <i>Resource developer</i> | 1 | 2 | 3 | 4 | 5 |

Please state your opinion about the following: Strongly disagree Disagree Neutral Agree Strongly agree

| | | | | | | |
|----|--|---|---|---|---|---|
| 24 | <i>I felt comfortable in my role as a teacher.</i> | 1 | 2 | 3 | 4 | 5 |
| 25 | <i>I believe that students benefited from my teaching</i> | 1 | 2 | 3 | 4 | 5 |
| 26 | <i>I learned a lot about techniques of teaching</i> | 1 | 2 | 3 | 4 | 5 |
| 27 | <i>I learned a lot about the subject matter while teaching</i> | 1 | 2 | 3 | 4 | 5 |
| 28 | <i>If I had the same choice, I'd choose to be a NPT again</i> | 1 | 2 | 3 | 4 | 5 |
| 29 | <i>Every medical student should learn how to teach</i> | 1 | 2 | 3 | 4 | 5 |

30 Please list what you consider strengths and weaknesses of students as near-peer teachers.

| Strengths | Weaknesses |
|-----------|------------|
| | |

31 Please state what type of preparation and guidance you think a near peer teachers should have, to enhance their performance in these teacher roles, and to yield maximum benefit for the students who receive this teaching

*=the types of teaching differed by the opportunities for teaching at each institution.

Figure 2. Near-peer teacher survey.

is 14.88 (SD \pm 8.70). At the Uniformed Services University (USU), 21 students responded which is estimated to represent a response rate of 33%. The mean number of teaching hours these students received from their near-peers was 20 (SD \pm 10).

Evaluation of teaching roles. The majority of the students at both Utrecht and USU (83.1% and 57.1%, respectively) identified information provider as a role that was taken on by the near-peer teachers. The role of facilitator was observed by 50.6% and 38.1% of the students at Utrecht and USU respectively. Teaching roles that were also observed frequently at Utrecht and USU were: role model (40.3% and 61.9%) and assessor (37.7% and 24%), respectively. The roles of curriculum planner and resource developer were rarely identified by the students at Utrecht and USU (1.3% and 14%; 1.3% and 9.5%, respectively).

Teaching roles that near-peer learners consider suitable for near-peer teachers are shown in Table 1. The results are similar at both sites with over 40% of respondents at both sites endorsing the roles of role of information provider, role model, and facilitator for near-peer teachers. All of the roles queried were viewed as being more suitable by a higher percentage of USU respondents than Utrecht respondents. The roles of assessor and curriculum planner were seen as less suitable roles at both sites.

Performance of their near-peer teachers. An important question is whether students think their near-peer teachers performed well in their teaching roles. This item was also answered on a 1 to 5 Likert-type scale ('strongly disagree' to 'strongly agree'; Table 2). The majority of the students at both sites agreed or strongly agreed with the statements that near-peer teachers performed well in their teaching roles and near-peer teachers can serve as effective teachers. Finally, students at both sites were asked to make a choice between faculty-led and student-led teaching on a 1-to-5 Likert-type scale (see Figure 1, question 17). About half of the students indicated that they would rather be taught by faculty (response 1 and 2), approximately 20% favoured a near-peer teacher (response of 4 and 5) and approximately one third were neutral regarding preference of student versus faculty led teaching (answer 3).

Strengths and weaknesses of near-peer teaching. A free text question asked students to summarize strengths and weaknesses of near-peer teaching (Figures 1 and 2). Free text comments at both sites were consistent. One of the comments made by students at both sites regarding strengths is that near-peer teachers are closer to the students than faculty members, which means that they may better understand the problems and challenges that students face. Another advantage for near-peer teaching mentioned at both sites is that by being closer to the students level of training, near-peer teachers can explain difficult concepts at an appropriate level. Near-peer teachers were also commented as often taking more time to explain concepts than faculty members and creating a 'safe atmosphere' to raise questions and concerns. Additionally, both sites quoted that near-peer teachers are perhaps better at

giving advice about study behaviour and knowing how the curriculum works.

Comments about weaknesses were also remarkably similar at both sites. Several participants commented that near-peer teachers have less knowledge than faculty members. Near-peer teachers also have limited clinical experience, which can make it difficult for them to motivate students or to illustrate practical clinical applications for discussion. Furthermore, near-peer teachers at times seemed more nervous, perhaps due to inexperience as well as having no real authority/power over the students they teach. Near-peer teachers are often very eager to explain difficult questions, which was viewed as a strength; however, in some cases this eagerness was felt to be a weakness in that it would be better to give students a chance to try and answer themselves rather than having the near-peer teachers directly answer questions.

Near-peer teacher survey

The response rate in the group of the near-peer teachers was 46% (24/52) for Utrecht and 50% for USU (15/30) for the study period. All near-peer teachers were in the sixth year of medical school while teaching junior students at Utrecht; at USU the near-peer teachers included 3rd and 4th year medical students. At both sites, the majority of the near-peer learners were first-year or second-year students. At Utrecht, some tutored third-year and fifth-year students (both 8.3%); no USU 3rd or 4th

Table 1. Near-peer learners' opinions on suitable teaching roles.

| | Utrecht (%) | | | | | USU (%) | | | | |
|----------------------|-------------|------|------|------|------|---------|------|------|------|------|
| Teaching role | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| Information provider | — | 7.8 | 15.6 | 51.9 | 24.7 | 5.0 | — | 14.3 | 38.1 | 42.9 |
| Role model | 1.3 | 14.7 | 37.3 | 40.0 | 6.7 | 5.0 | — | 14.3 | 66.7 | 14.3 |
| Facilitator | 7.9 | 13.2 | 26.3 | 46.1 | 6.6 | 5.0 | — | 19.0 | 33.3 | 42.9 |
| Assessor | 4.1 | 31.5 | 35.6 | 24.7 | 4.1 | 19.0 | 14.3 | 19.0 | 19.0 | 28.6 |
| Planner | 12.3 | 37.0 | 37.0 | 12.3 | 1.4 | 5.0 | 19.0 | 33.3 | 14.3 | 28.6 |
| Resource developer | 26.4 | 27.8 | 31.9 | 13.9 | — | 9.5 | 19.0 | 9.5 | 42.8 | 19.0 |

1: Very unsuitable; 2: Unsuitable; 3: Neutral; 4: Suitable; 5: Very suitable. $N = 77$ Utrecht participants, $N = 21$ USU participants.

Table 2. Near-peer learners' responses to questionnaire.

| | Utrecht (%) | | | | | USU (%) | | | | |
|--|-------------|------|------|------|-----|---------|---|-----|------|------|
| Question | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| In general, near peers who taught me performed well in their teacher roles | — | 9.1 | 24.7 | 59.7 | 6.5 | 5.0 | — | 5.0 | 66.7 | 23.8 |
| In general, I believe near peers can serve as effective teachers | 1.3 | 14.3 | 22.1 | 54.5 | 7.8 | 5.0 | — | — | 66.7 | 28.6 |

1: Strongly disagree; 2: Disagree; 3: Neutral; 4: Agree; 5: Strongly agree. $N = 77$ Utrecht participants, $N = 21$ USU participants.

year students served as near-peer learners at USU. All near-peer teachers taught in small group settings. At Utrecht, 41.7% also participated in practicals, and 29.2% of all near-peers trained students in physical examination. At USU, 17% trained students in physical exam, 13% participated in practicals, and 10% also served as larger group lecturers. The near-peer teachers taught a mean of 45.58 hours at Utrecht and 33.13 hours at USU; they spent 62.30 hours preparing for their teaching at Utrecht and 50.5 hours preparing for their teaching at USU.

Evaluation teaching roles. Near-peer teachers were asked to analyse the teaching roles in which they had participated. The majority of near-peer teachers at both sites served as facilitators. Other teaching roles that were frequently practiced by the near-peers are information provider and role model. Over half near-peer teachers at Utrecht participated as assessors (66.7%); less than 10% served as assessors at USU. Less than 10% at both sites also identified serving in the roles of curriculum planner and resource developer.

Near-peer teachers were also asked which roles they considered suitable for near-peer teachers (Table 3). Like the near-peer learners, near-peer teachers at both sites endorsed suitability of the roles of information provider, role model, and facilitator for near-peer teachers. Like the near-peer learner survey, all of the roles queried were viewed as being more suitable by a higher percentage of USU respondents than Utrecht respondents. The roles of curriculum planner and resource developer were seen as less suitable roles at both sites.

Performances of near-peer teachers. Near-peers were asked to react on six statements (Table 4) regarding their performance as a near-peer-teachers: 'I felt comfortable in my role', 'I believe that students benefited from my teaching', 'I learned a lot about teaching techniques', 'I learned a lot about the subject matter while teaching', 'I'd choose to be a near-peer teacher again' and 'every medical student should learn how to teach'. The responses from both sites were consistently positive with over half of the respondents agreeing to strongly agreeing with all of the queried items. Both sites had a minority of students disagree with the statement 'I learned a lot about teaching techniques' (20% for USU, 4% for Utrecht). The higher

percentage who disagreed with this statement at USU likely reflects the lack of a formal medical student teaching program unlike at Utrecht.

Strengths and weaknesses of near-peer teaching. The near-peers were also asked, in a free text question, to comment on strengths and weaknesses of near-peer teaching. Comments from both sites on strengths included that near-peers are closer to students because of a small difference in age and recent experience with the curriculum. This may make it easier to understand the problems that students face. Also, near-peer teachers from both sites identified the atmosphere in student-led teaching sessions as more informal, which might stimulate more interaction between students and near-peers. Another strength cited at both programs was that near-peer teachers are often very motivated to teach and prepare for teaching because they are participating on a voluntary basis and they can share their clerkship experiences. Finally, near-peer teachers at both sites commented that teaching skills are essential to every clinician to learn.

Comments on weaknesses from both sites include that near-peer teachers do not possess the knowledge of an experienced clinician. Another stated weakness by near-peer teachers at both sites is that because of the more informal situation, the near-peer teacher might lose control over the

Table 3. Near-peer teachers' opinions on suitable teaching roles.

| | Utrecht (%) | | | | | USU (%) | | | | |
|----------------------|-------------|------|------|------|------|---------|------|------|------|------|
| Teaching role | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| Information provider | — | — | 12.5 | 50.0 | 37.5 | — | — | — | 6.7 | 93.3 |
| Role model | — | 29.2 | 12.5 | 25.0 | 33.3 | — | — | 13.3 | — | 86.7 |
| Facilitator | — | — | — | 41.7 | 58.3 | — | — | — | 33.3 | 66.7 |
| Assessor | — | 8.3 | 25.0 | 54.2 | 12.5 | 6.7 | 6.7 | 26.7 | 13.3 | 40.0 |
| Planner | 4.3 | 30.4 | 39.1 | 17.4 | 8.7 | 6.7 | 20.0 | 20.0 | 20.0 | 33.3 |
| Resource developer | 4.3 | 43.5 | 34.8 | 17.4 | — | 6.7 | 20.0 | 20.0 | 13.3 | 40.0 |

1: Very unsuitable; 2: Unsuitable; 3: Neutral; 4: Suitable; 5: Very suitable. *N* = 24 Utrecht participants, *N* = 15 USU participants.

Table 4. Near-peer teachers' responses to questionnaire.

| | Utrecht (%) | | | | | USU (%) | | | | |
|---|-------------|-----|------|------|------|---------|------|------|------|------|
| Question | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| I felt comfortable in my role as a teacher | — | — | 4.2 | 79.2 | 16.7 | — | — | — | 40.0 | 60.0 |
| I believe that students benefited from my teaching | — | — | 8.3 | 87.5 | 4.2 | — | — | 5.0 | 46.7 | 46.7 |
| I learned a lot about techniques of teaching | — | 4.2 | 12.5 | 41.7 | 41.7 | — | 20.0 | 26.7 | 6.7 | 46.7 |
| I learned a lot about the subject matter while teaching | — | — | — | 50.0 | 50.0 | — | — | 6.7 | 13.3 | 80.0 |
| If I had the same choice, I'd choose to be a NPT again | 4.2 | — | — | 20.8 | 75.0 | — | — | 13.3 | 26.7 | 60.0 |
| Every medical student should learn how to teach | — | 8.3 | 8.3 | 50.0 | 33.3 | — | — | 6.7 | 13.3 | 80.0 |

1: Strongly disagree; 2: Disagree; 3: Neutral; 4: Agree; 5: Strongly agree. *N* = 24 Utrecht participants, *N* = 15 USU participants.

group or the students might not take the near-peer teacher seriously since he or she is also still a student. Some near-peer teachers found it difficult to be strict because of the informal situation, not only during tutorials but also when assessing students. They stated that it might be difficult to be objective with evaluations due to the informal setting.

Preparation for near-peer teaching. Finally, we asked the near-peer teachers their opinions about the most appropriate way to prepare for near-peer teaching. Before teaching other students, near-peers from both sites commented that they would like to learn:

- how to guide a group and take control of the teaching session;
- to what extent the content of the lessons should be prepared versus interactive discussion;
- how to deal with questions and problems, especially if the near-peer cannot answer them during the lesson;
- how to handle 'difficult' students (e.g., unmotivated, dominant, impolite);
- how to optimize the group learning process.

Additional tips on preparing near-peer teachers included:

- give an introduction about how to teach, how to introduce yourself and the subject, how to prepare yourself for teaching fellow students, how to cope with group dynamics;
- give near-peer teachers an opportunity to ask questions to an expert on the subject matter prior to the session;
- let near-peers be observed by and given feedback from an experienced teacher;
- schedule time for feedback, so near-peers can evaluate their own teaching methods;
- let near-peers observe experienced teachers;
- consider videotaping near-peer teachers for purpose of giving feedback;
- organize regular sessions for the near-peers to discuss experiences and difficulties.

Existing faculty development materials (such as the Stanford Faculty Development Program) could be used to address many of these stated needs, which are consistent with stated learning needs by faculty teachers.

Discussion

Medical schools are responsible for assuring that every graduating student is fit for entry into residency training. 'Doctor' in Latin means 'teacher' and one of the key activities of a physician is teaching. We define a near-peer student teacher as being a student who is one or more years senior in medical school teaching more junior students who are one or more years junior in medical school with the more junior students' being defined as near-peer student learners. We explored the perceptions of near-peer learners and near-peer teachers by surveying a convenience sample of students at two institutions from two different countries to determine their perceptions about this phenomenon.

The consensus of near-peer learners and near-peer teachers alike is that the roles of information provider, role model, and facilitator are appropriate for near-peer teaching and learning. Many of the near-peer teachers felt the role of assessor was not beyond their capabilities, which likely reflects the near-peer teachers' need for additional training in assessment to be able to provide such information to their near-peer learners. Both groups felt that planner and resource developer were less suitable for student near-peer teachers.

An important difference between our study sites is that the second year students from Utrecht received teaching from both a non-voluntary as well as a more experienced voluntary group of near-peer teachers. The 'near-peer teachers' survey was filled out only by the voluntary near-peers. The near-peer teachers from USU only participate on a voluntary basis.

The near-peer teachers as well as near-peer learners from both USU and Utrecht had very similar opinions as to the roles and effectiveness of near-peer teachers. In addition, the majority of near-peer teachers felt that they learned a lot about the subject matter they taught, they were comfortable in their role as teacher and they would do it again. Additionally, roughly 25% of near-peer learners from both sites identified a preference to receiving their teaching from near-peer teachers as opposed to faculty. The majority of the students closest to their graduate medical education, when they will be required to teach junior physicians and medical students, felt being able to teach is an appropriate objective of today's graduating medical student.

Our findings are consistent with current theory and build upon the results reported by others in the literature (Lockspeiser et al. 2006) for the setting of near-peer teaching. More specifically, our findings support the theories of cognitive congruence and social congruence as applicable to the phenomenon of near-peer teaching.

The majority of student near-peer learners felt their near-peer performed well and could serve as effective teachers in small group settings; we did not receive sufficient data to comment regarding large group settings (i.e. lecturing to a class of medical students). Concerns raised by near-peer learners and teachers included that near-peer teachers have less of a knowledge base, less clinical experience, and teaching experience in comparison to seasoned professors. The positive responses from both near-peer teachers and learners regarding near-peer teaching experiences in this study may reflect that these qualities are not as important for the small group formats taught by near-peer teachers in this study. In addition, near-peer teachers are utilized as augmenters to the staff at both sites, providing opportunities for more one on one teaching within small groups. In most cases even if the near-peer is the presenter, a seasoned physician will also be in the room to interject his or her experience based clinical scenarios and expertise.

The physician-patient role has become less paternalistic and more of a partnership. Being able to effectively communicate and teach your patients about their illnesses and treatment is crucial. In this study, experiences of both the near-peer student learners and their near-peer teachers were favorable. Our hope is that this study will stimulate discussion among institutions to consider (or further) incorporating

near-peer teaching into their curriculums to enhance the preparation of students for the future challenges of our dynamic medical communities. Early application of teaching skills in medical school can only enhance patient and fellow physician education upon entry to graduate medical education and beyond. With implementing near-peer teaching programs, it is important to note that like faculty teachers, near-peer teachers want to be well prepared for their role as a teacher, and most may lack formal educational experience. Taking the time to train near-peer teachers the essential styles of teaching, particularly how to speak to your audience, maintain their attention, provide guided facilitation of discussions, assess your audience's understanding and trouble shoot basic student/teacher incompatibilities would benefit the dynamics of the near-peer teacher–learner interaction.

Our study had several limitations. We surveyed a convenience sample of student near-peer teachers and learners from both institutions. This was a study of perceptions and we did not obtain objective outcome measurements. Our study was limited to undergraduate medical education and our findings may not be generalizable to graduate medical education settings. Our two institutions curriculum differ, in that Utrecht requires participation in PBL modules as near-peer teachers, and USU merely offers the opportunity to work along side professors to teach in lab/small group settings for those motivated to do so. There is a selection bias in our findings as only those students motivated and interested in teaching choose to participate as a near-peer teacher. Given this, it is interesting that our results were consistent in most areas assessed. Our limited response rates for both near-peer teachers and learners raise concern regarding the potential for non-response bias. However, our similar results from convenience samples from institutions representing two different nations as well as findings that have concordance with current theory suggests that non response bias may not have had a significant effect on results.

Additional studies at universities with differing levels of near-peer teaching and learning opportunities would provide further basis for curriculum planners who are considering near-peer teaching as an important innovation for learners. Furthermore, certain subjects are more amenable to near-peer teaching? For example is a near-peer teacher more appropriate for teaching a small group about basic physical exam skills or the anatomy of the abdomen than a class on ethics of health

care, or the difficulties of death and dying; our limited findings suggest that small group formats where near-peer teachers have relative expertise to their learners may be best. Finally do opportunities to teach as a medical student improve the teaching of their patients which may benefit patient care, patient compliance and overall patient satisfaction.

Acknowledgement

The authors would like to thank Dr Olle Th.J. ten Cate for his helpful revisions to this manuscript.

Notes on contributors

CAROLIEN BULTE is a sixth year medical student at the University Medical Centre Utrecht, the Netherlands and near-peer teacher in a student teaching rotation at the time of the conception of this study.

AARON BETTS is a fourth year medical student at the Uniformed Services University of the Health Sciences, USA.

KATHRYN GARNER is a fourth year medical student at the Uniformed Services University of the Health Sciences, USA.

DR STEVEN J. DURNING is an associate professor of Medicine at the Uniformed Services University of the Health Sciences, USA.

References

- Edwards JC, Friedland JA, Bing-You R. 2002. *Residents' Teaching Skills* (New York, Springer).
- Harden RM, Crosby J. 2000. The good teacher is more than a lecturer – the twelve roles of the teacher. *Med Teach* 22:334–347.
- Kassab S, Abu-Hijleh MF, Al-Shboul Q, Hamdy H. 2005. Student-led tutorials in problem-based learning: educational outcomes and students' perceptions. *Med Teach* 27:521–526.
- Lockspeiser TM, O'sullivan P, Teherani A, Muller J. (2006) Understanding the experience of being taught by peers: the value of social and cognitive congruence. *Advances in health sciences education: theory and practice*. Electronic publication ahead of print. DOI: 10.1007/s10459-006-9049-8 (Accessed May 27, 2007).
- Nnodim JO. 1997. A controlled Trial of Peer-Teaching in Practical Gross Anatomy. *Clin Anatomy* 10:112–117.
- Schmidt HG, Moust JH. 1995. What makes a tutor effective? A structural-equations modeling approach to learning in problem-based curricula. *Acad Med* 70:708–714.
- Sobral DT. 1994. Peer tutoring and student outcomes in a problembased course. *Med Educ* 28:284–289.
- Solomon P, Crowe J. 2001. Perceptions of student peer tutors in a problem-based learning programme. *Med Teach* 23:181–186.