Introducing Peer-Assisted Learning into a Veterinary Curriculum: A Trial with a Simulator

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ABSTRACT

Peer-assisted learning (PAL) was implemented in the context of delivering training with a simulator, the Haptic Cow. This project was undertaken as a way of increasing student access to the simulator and to investigate the possibility of using PAL more extensively in the curriculum. Peer tutors attended a workshop to learn basic teaching skills and were then trained to use the simulator. The tutors taught their peers the basic skills for bovine rectal palpation with the simulator. The PAL project was evaluated using questionnaires and a focus group to gather feedback from both tutors and learners. Sixteen peer tutors trained 99 fellow students with the simulator. Both tutors and learners thought that there were certain advantages in students, rather than veterinarians, delivering the training. Student tutors were less intimidating and could relate more closely to the difficulties of their peers. However, lack of knowledge was identified as a potential issue. Students reported certain benefits from their role as tutors, including improvements in communication skills, knowledge of the subject area, and confidence in performing bovine rectal palpation. Additionally, the skills developed, including learning to teach, were considered to be useful for their future careers as veterinarians. Tutors and learners supported the continued use of PAL both with the simulator and in other areas of the course. The trial of PAL proved a successful way of delivering simulator-based training and the project has provided a basis for the further use of PAL in our curriculum.

Key words: peer-assisted learning, Haptic Cow, bovine rectal palpation, simulator

INTRODUCTION

Peer-assisted learning (PAL) has been used in schools, higher education, and the workplace for many years and has been defined as ''people from similar social groupings who are not professional teachers helping each other to learn and learning themselves by teaching.''[1] There are a number of benefits associated with PAL for both tutors and learners.[1–4] Tutors increase and reinforce their knowledge and understanding of the subject area, learn about teaching, and improve their communication skills.[5,6] Learners are able to practice skills in an informal and relaxed environment while being taught by someone who can closely relate to the difficulties and challenges encountered.[7] There has been a significant body of empirical evidence supporting PAL in medical education settings for some years,[8–11] including studies in which students in PAL programs have been shown to out-perform other students.[12,13] The General Medical Council document *Tomorrow's Doctors*, which outlines the latest guidelines for undergraduate medical education in the UK, now includes the recommendation that doctors of the future should be willing and able to teach.[14] As a result, an increasing number of UK medical schools are including PAL courses in the curriculum and medical students are teaching a range of skills, including clinical skills, to their peers[15–18] and other health professionals.[19]

In veterinary education, the role of students as teachers was suggested by Armistead in 1970 as one of a number of alternatives for delivering training in a veterinary curriculum.[20] The suggested advantages included leaving faculty members free for other duties and improving student motivation, communication skills, and learning (''the best way to learn is to teach''). In some respects, PAL is already part of veterinary education as students often turn to their peers for assistance, particularly when working together in small groups, for example during laboratory classes and problem-based learning sessions. There have also been several reports of projects looking more formally at the use of PAL. A ''buddy system'' was used at Murdoch University, Western Australia, in which final (fifth)-year students were accompanied on ward rounds by third-year students, with the aim of giving pre-clinical students more exposure to clinical cases.[21] Another example involved senior students providing additional assistance in an operative surgery laboratory, a role they chose as an elected clinical clerkship.[22] A form of PAL has also been trialed in a gross anatomy course, where a student would summarize the dissection just completed to the following group of students.[23] All of these examples report that PAL, in the various forms, was enthusiastically received by students.

The purpose of our study was to trial the use of PAL in the development of a specific clinical skill at the Royal Veterinary College, University of London. We had a number of reasons for wanting to introduce and investigate the use of PAL. Several members of staff had expressed an interest in using PAL as part of their courses. We were also looking for ways to give third-year students access to a simulator, the Haptic Cow.[24] The simulator was to be used to teach basic bovine rectal palpation skills prior to the first live animal examinations. Simulator training involved one-on-one tuition, and because student numbers have increased in recent years there were several issues to address: providing enough tutors, ensuring adequate supervision, and finding space within the timetable. Therefore, instead of staff delivering the training, two alternative approaches were taken. An automated version was developed that students

could use on their own (where the instructor's role is replaced by computer guidance) and student tutors were recruited to deliver one-on-one tuition (i.e., PAL). The aim was that students would have access to the simulator in a more sustainable and flexible way. In this paper, we report on a study to investigate the use of PAL in the context of delivering training with the Haptic Cow simulator.

METHODS

Planning and Delivering PAL

The PAL activity was timetabled for the final term of the third year of the veterinary degree program, just before the students would be undertaking extramural studies (work-place training) on farms with veterinarians. The tutors and the learners were third-year students in an example of same-year, fixed-role peer tutoring.[1] This represents a ''true'' peer rather than a cross-year ''near'' peer tutoring activity. The primary reason for choosing peer tutors at the same stage rather than at a more advanced stage of the course was to make it easier to organize times when the tutor and learner could get together.

While planning to implement our PAL project, it became clear from the medical literature that such courses must be well designed and conducted, with peer tutors suitably trained and supported in their role.[25] We enlisted help from those running PAL courses for medical students at University College London. This led to the development of a training workshop for our peer tutors.

Sixteen tutors were randomly selected from a list of 75 third-year students who volunteered to act as peer tutors. Students consented to take part in the project on the understanding that this was a trial and the role was unpaid. Students attended a peer tutors' workshop (run for two groups of eight). The objective was to equip the tutors with the basic skills and understanding that would enable them to teach their peers a specific task. The workshop was designed in such a way that it could be adapted for future applications. Initially, a short presentation was given that covered the background to the simulator: the research, development, and its use as a teaching tool. The main part of the workshop then covered ''session planning,'' ''aims and objectives,'' ''questioning,'' and how to deal with shortfalls in knowledge. Each section involved a short presentation to introduce the subject area and then activity-based tasks, which were followed by group discussions. The ''session planning'' section showed the students how to structure a lesson. Although, for the simulator training, the lesson plan was going to be provided, it was considered useful for the tutors to have an understanding of the lesson structure and why it was important to follow the outlined plan. The next part, ''aims and objectives,'' introduced and expanded on the meaning of these terms and then explored the factors that should be taken into consideration. The workshop also included a section on ''questioning,'' because the students would be actively involved in asking and responding to questions. Therefore, the students learned to write different types of questions (open and closed, and at different levels of Bloom's taxonomy[26]), and explored ways of answering. Finally, the group discussed what to do when they did not know the answer. The presentations and worksheets were included in a PAL peer tutor's pack.

The tutors were then trained to use the Haptic Cow simulator and practiced teaching fellow tutors. A training manual was included in the tutor's pack, and this outlined the lesson plan and could be used for reference. The simulator-based training aimed to equip students with the skills to find the uterus when examining cows for the first time. A previous study has shown the simulator to be effective in this role.[27] The PAL simulator training was scheduled for one-hour sessions in which each tutor would teach three student learners one after another, one-on-one, in 20-minute slots. The learners were randomly selected from those who volunteered to take part in the trial. As a form of quality control, a member of staff observed each peer tutor for one or more teaching sessions. This aimed to ensure that the tutor was using the lesson plan correctly, and to identify any misunderstandings and address any issues relating to the simulator. The peer tutors could contact a member of the project group during training sessions if required, and they were encouraged to send e-mail inquiries afterwards with any other questions.

Evaluation of the PAL Project

The peer tutors were asked to complete questionnaires before and after the project by answering questions and responding to statements (qualifying their answers on a five-point Likert-type scale: ''strongly agree,'' ''agree,'' ''neutral,'' ''disagree,'' or ''strongly disagree''). Free-text sections were included to give peer tutors the opportunity to enter comments. In the pre-PAL questionnaire, the tutors were asked about their reasons for volunteering, to list advantages and disadvantages of using students rather than veterinarians as tutors, and to list their concerns about their role. In the post-PAL questionnaire, tutors were asked about the effects of being a peer tutor, how the experience might be useful for their future careers as veterinarians, and the use of PAL in the future.

At the end of the project, peer tutors were invited to a de-briefing meeting where their experiences were canvassed in a more informal way. In addition, a group of learners was chosen at random and invited to attend a focus group to give feedback on their experiences of the project. Transcripts of the group discussions were used together with field notes and the data were analyzed using a coding framework to codify and then uncover themes using a thematic analysis approach.[28]

RESULTS

The 16 peer tutors taught 99 learners the basic skills for bovine rectal palpation using the Haptic Cow simulator. All of the peer tutors returned the pre-PAL questionnaire and 12 returned the post-PAL questionnaire. Nine of the tutors attended a project de-briefing. Seven students attended a learners' focus group at the end of project.

Pre-PAL Questionnaire (Peer Tutors)

Students' responses to being asked about their reasons for volunteering to act as tutors are shown in Figure 1. The main motivations (all students selecting the ''strongly agree'' or ''agree'' categories) related to increasing their knowledge, skills, and confidence for performing bovine rectal palpation, and getting access to the simulator. The majority of students also selected ''to develop

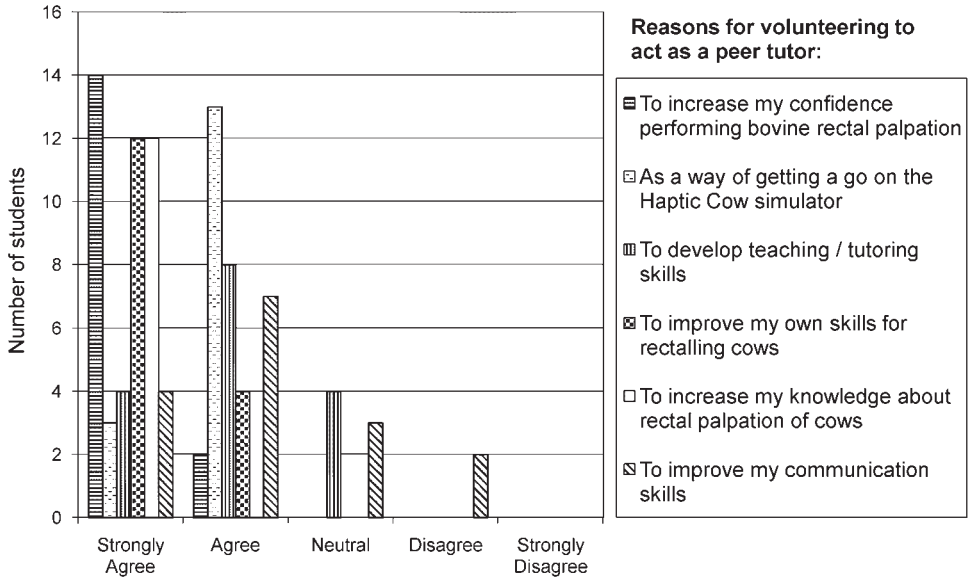

Figure 1: Student responses ($N = 16$) to statements in the pre-PAL questionnaire relating to their reasons for volunteering to act as peer tutors

teaching/tutoring skills'' (75% strongly agree or agree) and ''to improve my communication skills'' (69% strongly agree or agree).

Peer tutors were asked to list what they thought might be the advantages of students rather than veterinarians providing the teaching. Two major themes were identified. These related to students being more comfortable with another student as the tutor, who would be ''less intimidating,'' and to a student having a better appreciation of the difficulties of the exercise. Other minor themes were that students would have more time to teach than members of staff and that there might be benefits for students in their role as tutors.

When the peer tutors were asked about the disadvantages of students rather than veterinarians providing the teaching, the main theme related to students' lack of experience and knowledge about the subject area. Students were also asked to list their concerns about taking part in the project. Here, the main themes related to not having the skills to teach, using the simulator, the time commitment involved, and providing accurate information.

Post-PAL Questionnaire (Peer Tutors)

Where appropriate, students were asked to respond to the same statements as in the pre-PAL questionnaire. The responses are shown in Figure 2. Of the 12 tutors who returned the questionnaire, all were positive about developing teaching and communication skills, as well as about the effects on their knowledge and confidence for bovine rectal palpation. Other benefits identified in the comments related to an overall improvement in confidence, for example in the contexts of communication and ''making the most of [extramural studies] and rotations.'' Other aspects of the project that tutors valued included ''meeting other people in my year'' and ''the enjoyment of being involved and hopefully contributing something useful.''

However, some students felt that teaching more experienced students (from the same year but with more farm animal experience) was ''not appropriate.'' When asked about difficulties encountered using the simulator most reported ''none,'' but there were a few minor issues related to securing the finger in the thimble attachment to the mechanical arm and remembering to start the simulator in the correct position.

Students were also asked to comment on how they thought the experience of being a peer tutor might be helpful during their future careers as veterinarians. The main themes identified related to improved communication skills for dealing with clients and staff, and that teaching skills would be useful when providing extramural studies (workplace training) for veterinary students of the future. Additionally, having a structured approach (a lesson plan) was seen as a potentially useful model for certain aspects of veterinary work, for example ''I think it would be useful to plan like this for consults.'' In the final ''general comments'' section of the questionnaire, one student summarized the project: ''I really enjoyed it as I have felt it was both rewarding and beneficial for me and others.''

De-briefing (Peer Tutors)

The de-briefing for the tutors at the end of the project produced a lively discussion. They had found the course a positive, although sometimes challenging, experience. They were in favor of continuing to act as tutors, although they felt that having enough time might be an issue, and recommended that the college recruit and train more students. They had found the peer tutors' workshop very helpful in preparing them for their role. The main benefits identified related to helping them feel more confident about acting as a tutor, understanding the role of a teacher, knowing how to design questions, and appreciating the importance of communicating effectively. The main concerns raised in the discussion, as in the questionnaire feedback, related to their knowledge of the task, particularly when teaching more experienced students. The students felt that they had been well supported in their role as tutors by the project team. However, they suggested that there should

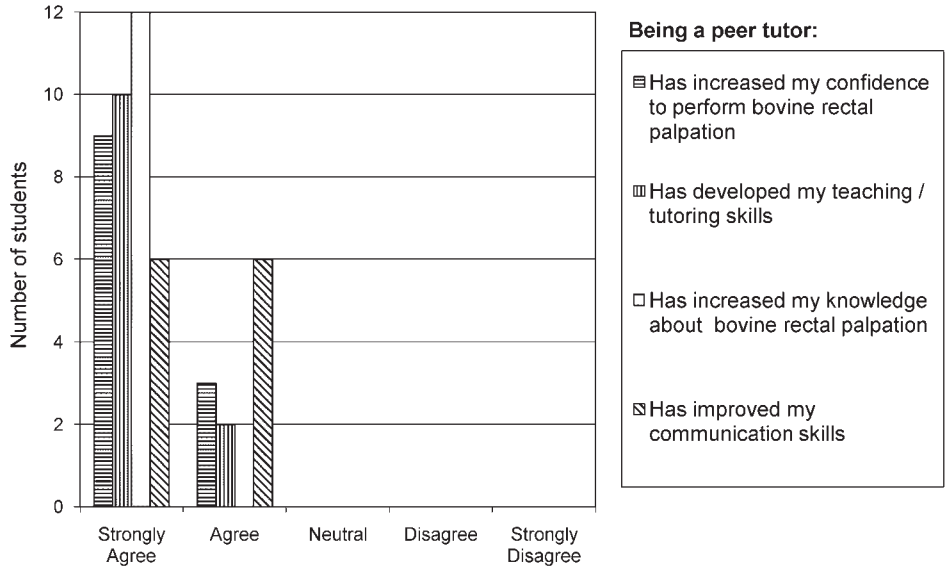

Figure 2: Student responses ($N = 12$) to statements in the post-PAL questionnaire relating to the effects of being a peer tutor

be more training in the future in the specific subject area and information made available that related to it. If PAL was to be used again, whatever the context, the students thought that the workshop should be part of the preparation tutors received.

Focus Group (Peer Learners)

Seven learners attended a focus group at the end of the project. Their comments about the advantages and disadvantages of students, as opposed to veterinarians, delivering the training were similar to those of the tutors. They felt ''less pressurized'' by and were ''more comfortable'' with peer tutors delivering the training, and appreciated being taught by someone who could relate to the difficulties of the exercise (e.g., ''they understand how hard it is sometimes to find structures''). Additionally, the students thought that using PAL with the Haptic Cow meant that there would be more opportunities to use the simulator and staff would be left free for other duties. The main limitation of PAL related to when the tutor was unable to answer a question. Furthermore, some learners missed the ''tips from experience'' that a veterinarian might have included as part of the training.

Using PAL in the Future

Both peer tutors and learners were asked whether PAL should be used again. All respondents (tutors returning the post-PAL questionnaire and learners at the focus group) supported the continued use of PAL with the Haptic Cow and its introduction to other parts of the course. Both groups suggested other areas where PAL might be suitable, including animal handling, anatomy dissections, and clinical examinations, as well as in many of the practical skills taught in the clinical skills laboratory. Two of the peer tutors also suggested a mentoring-type role to help students who were having difficulties with aspects of the course.

DISCUSSION

This project used PAL as a way of increasing student access to a clinical skills simulator, the Haptic Cow. This also provided a context in which to trial PAL at the college, because a number of staff were interested in a potential role for peer tutoring in their courses. The peer tutors successfully delivered simulator-based training and PAL was enthusiastically received by all students involved, both tutors and learners. The feedback from the students will help us to improve the preparation of and support for peer tutors, and will inform the development of a protocol for using PAL in our curriculum.

PAL is known to have a number of benefits for both tutors and learners, and the findings of our project are similar to those reported by others using PAL with medical students.[15,16] The tutors' feedback indicated that, as a result of the PAL project, their knowledge and confidence to perform bovine rectal palpation had increased. Being tutors had also helped them to develop their communication and teaching skills. Interestingly, although improving communication and teaching skills were not the major reasons for volunteering, these were reported as major benefits at the end of the project. Students also appreciated that developing these skills would be useful for their future careers as veterinarians, and some recognized the value of a structured approach (i.e., a ''lesson plan'') as a way of preparing for certain aspects of their work, such as consultations.

Both tutors and learners felt that there were certain advantages associated with using students rather than veterinarians to deliver the simulator training. Peer tutors were less intimidating and could relate more closely to learning the task and the difficulties encountered. Veterinarians often have trouble remembering what it was like to learn such routine, but challenging, skills. Therefore, there may be a case for peer tutors rather than veterinarians teaching certain basic practical skills—learners may be better able to focus on the task when the training

environment is more relaxed and informal. However, one of the risks identified in the feedback related to limitations in the student tutors' knowledge. Various options are being considered to address this issue. The tutors were "true" peers (i.e., at the same stage in the course as the learners), primarily for ease of scheduling, but in the future "near" peers (i.e., students from a more advanced stage in the course, who would have had more classes and practical experience in large-animal reproduction) may be recruited. Another option would be to provide more support via a PAL discussion board on the college Intranet. Tutors could post questions, discuss issues, and inform others of tutoring tips. The discussion would be overseen by the member of staff responsible for the course in which PAL was being used. A document summarizing the issues raised in the current project, together with the responses from the project team, will also be made available to future groups of peer tutors.

A large number of students (75) volunteered to act as peer tutors, which was encouraging. This was almost certainly influenced by the desire to gain access to the simulator, but hopefully also reflects a willingness to become involved in PAL. When asked about their motivations for volunteering, all of the peer tutors said they wished to increase their knowledge and skills for bovine rectal palpation and to use the simulator. Whatever the motivation, there was strong support at the end of the project from both tutors and learners for continued use of PAL both with the Haptic Cow and in other areas of the course.

If PAL is to be introduced in a veterinary curriculum, it is worth considering when and how it should be used to optimize the benefits for students and the institution. For example, if trained in the first or second year, tutors could use their skills as they progress through the course for both specific PAL projects and more informally when working with others in group exercises. In medicine, PAL is also used at an inter-professional level,[19] and could be applied in veterinary education with veterinary students and nurses. In this context, PAL encourages team building, mutual respect, and the development of professional working relationships, all of which are helpful for building an effective workplace. Additionally, as the peer tutors will be providing extramural studies in the future, there would be further benefits to veterinary education if graduates had some training as teachers. Developing teaching skills might then become a valid outcome of undergraduate education, as it is in medicine.[14] However, realizing the potential benefits of PAL in a veterinary context will depend on the development and delivery of well-structured and well-managed PAL projects. Therefore, we plan to take PAL forward by providing a short workshop for staff to explain the concepts, potential applications, benefits, and issues associated with using PAL. Additionally, the peer tutors' workshop will be made available as a resource for those wishing to implement PAL as part of their courses. For the students, we need to consider the time pressures they are under, whether they receive remuneration, and the possibility that teaching activities could become a legitimate entry in their portfolios.

The tutors and learners identified a number of other areas where PAL could be used in the curriculum. The suggestions included teaching animal handling and clinical examinations, as well as in laboratory practical classes. The context in which PAL is used would affect the likely benefits, the challenges when delivering and running the course, and the issues arising from PAL. The PAL tutors' workshop was designed as a resource that could be used to prepare any group of peer tutors for their role as teachers. However, in each particular context some of the content and the subsequent support provided would need to be modified and the learner experience monitored.

One of the motivations for this project was to provide students with training on the Haptic Cow simulator in preparation for examining live cows. With increasing student numbers, relying on a member of staff to deliver one-on-one training could present certain practical constraints, particularly in relation to providing all students with the opportunity and time to develop the basic but fundamental manual skills required. PAL, used in conjunction with an automated (self-teaching) version of the simulator, provided a more sustainable way of giving students access to simulator training. This also meant that staff time could be directed more appropriately. For example, in clinical rotations the haptic simulators, bovine and equine, are used by clinicians to run case-based tutorials, to address strategic skill deficiencies, in role-play exercises, and as a complement to clinical cases.

In conclusion, PAL was successfully introduced at the college in the context of delivering training with a clinical skills simulator. There were clear benefits for the peer tutors, who were "learning themselves by teaching."[1] The experience allowed them to develop a number of skills that will be useful in the future, both as students and later as veterinarians. Preparing and supporting the tutors in their role was important. However, this was not a trivial undertaking and should be factored into any proposal to introduce PAL. As identified in this and other projects, peer tutors are very good at relating to the challenges associated with learning certain skills and teach with empathy and understanding. This suggests that peer tutoring could, and probably should, have a place in the diverse range of learning and assessment opportunities already available and continuing to develop in veterinary curricula.

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