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Discussion

Teaching doctors how to teach

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ABSTRACT

Doctors are required to actively participate in the training and teaching of their colleagues and therefore must be competent at teaching others. However, opportunities to develop these required teaching skills are lacking in the current medical curricula. Consequentially, trainees are forced to look beyond the restraints of their standard curriculum. Near-peer teaching (NPT) appears to provide a fitting solution to the current lack of teacher training in medical education. NPT demonstrates well-documented benefits to the teacher, learner and faculty and is supported by several well-established pedagogical theories. Considering the requirement of future doctors to act as teachers and the importance of these skills, it may be appropriate to recommend that NPT no longer acts as a supplement to medical education, but rather as a core feature so that it may address the often ignored and neglected curricula component of teaching skills.

Key terminology

- Near-peer teaching (NPT): A student learning from another student who is one or more years more advanced on the same curriculum.
- Peer-assisted learning (PAL): A student learning from another student who is often at the same educational level.
- Pedagogy: The theoretical and academic principles behind the methods and practice of teaching and education.
- Cognitive congruence: The sharing of a similar knowledge framework.
- Social congruence: The sharing of mutual interpersonal characteristics.
- Constructivism: The belief that students learn best when they gain knowledge through exploration and active learning.
- Partnership learning: The process of applying well-evidenced approaches to learning, teaching and assessment with a commitment to open, constructive and continuous dialogue in a partnership model between student and teacher.

INTRODUCTION

Medical students are required to develop skills that extend beyond their clinical competencies; (1) a prominent example is the ability to teach others. Being an effective teacher is expected of all medical students, as outlined by the General Medical Council's (GMC) guide for "Good Medical Practice". (1) It is clearly stated within this framework that medical students are expected to actively engage in the practices of continuous learning and the teaching of their colleagues. This is not just an essential attribute of aspiring doctors but also a required skill of many qualified medical professionals.

At one time or another, all doctors will be responsible for the education of their junior colleagues. Therefore, it seems logical that medical curricula should include formal education initiatives to equip individuals with the appropriate capabilities, behaviours, and professional skills that will be required of them. However, currently, it appears that informal teaching initiatives or extracurricular student-led programmes are solely responsible for the development of these skills. (2-4) If opportunities are designed within the curriculum, they tend to be student selected units rather than core learning outcomes for all students. (2) This seems misplaced given the importance placed upon these transferable skills as described by the GMC. Furthermore, the National Health Service's (NHS) apprenticeship approach of on-ward medical training depends mostly on senior trainees teaching their younger counterparts successfully. Therefore, a strong grounding in these skills and behaviours at medical school should be considered mandatory. If junior doctors are not equipped with the knowledge and experiences that enable effective teaching, then the longitudinal transfer and integration of knowledge will most likely be impacted upon.

Although students can initiate teaching opportunities for themselves, they are unlikely to benefit from being educated using the most up to date and appropriate pedagogical techniques, unless there is expert support and guidance from the faculty. The over-reliance on informal pathways may well fill the void of exposure and experience, but it will not ensure best practice, reflection, and growth. In this article, we propose that educating medical students in both theoretical and practical based methods of teaching should become a core curriculum consideration, and these efforts should begin early on within undergraduate training – a view that is currently supported by some of the literature. (5, 6)

Finally, there is also evidence to promote the idea that this approach can be extended even further – to give students hands-on experience with the full repertoire of what constitutes higher educational practice. Such aspects could include change management initiatives, curriculum design, revalidation processes and assessment practices. This would ultimately give students insight into educational strategy along with developing a further set of transferable skills such as professionalism and leadership.

A POTENTIAL SOLUTION

One solution that many are finding to be a good fit comes in the form of near-peer teaching (NPT). (7) NPT can be broadly defined as a student learning from another student who is one or more years more advanced on the same curriculum. (8) NPT can be considered a form of peer-assisted learning (PAL). (8) Despite some discrepancies in how best to define NPT and PAL, the core difference lies within the relative stages of education. In PAL, the student and teacher are often at the same educational level, whereas in NPT, the teacher is often one or more years more advanced. However, despite these terms often being used interchangeably, peer teaching is a more established approach that has previously been integrated into several areas of undergraduate training, including clinical skills, communication development, anatomy and patient examinations. (9) Currently, NPT seems somewhat restricted to pre-clinical anatomical education. (10)

Many examples of NPT programmes reported in the literature are untenable because they rely on one or two key individuals to deliver them. A more sustainable approach might be achievable through partnership models between staff and students where both groups share ownership and responsibility for its implementation and provision. Building in scholarship also provides student leaders with academic rewards that can support their portfolios. In this way, the partnership model recognises that the highest quality of teaching can only be achieved following a more thorough understanding of all the component parts that constitute educational practices. Furthermore, NPT enables students to become involved in training future generations of near-peer teachers. Therefore, they not only reinforce knowledge of the subject area that they are teaching but also for the teaching skills they are passing on to others.

There are, of course, benefits to the faculty by using a sustainable model of NPT, too. Traditional methods of clinical education include large group didactic teaching. However, applying NPT within the curriculum provides many more opportunities for quality controlled small group case-based learning. (17, 19) Finally, the well-established shadowing/apprentice model of on-ward teaching has historically suffered from inconsistent and highly variable student experiences. Early training in teaching skills may alleviate this through time, as students will graduate with knowledge of the guiding principles of good educational practice.

CURRENT EXAMPLES OF NPT

Due to its currently less well-defined nature, NPT lends itself to supplementing the standard medical curricula by providing additional, less formal and often more engaging learning opportunities beyond the remit of traditional programmes. This is well evidenced by the University of Southampton's and Brighton and Sussex Medical School's NPT programmes which have been delivering neuroanatomy education for over 12 years, using this model. (11) At the University of Southampton, there is no formal neuroanatomy teaching after the pre-clinical phase. Therefore, the NPT programme was created to enable students on clinical rotations to continue their neuroanatomical education and teaching skills. (10) This provided a form of vertical integration of anatomy within the latter stages of medical education.

Within the Southampton programme, third-year and above medical students are identified, selected and trained on effective teaching methods by the staff – the training of near-peer teachers is built into the model. These include over 12 hours of pre-delivery micro-teaching experience on how to teach with a specimen, appropriate use of PowerPoint, student communication and effective blending of multimedia learning resources. (10) The student teachers then co-design, co-create and deliver the neuroanatomical curricula for the more junior students alongside the faculty. This non-hierarchical approach is not one of mentorship or supervision but rather shared ownership, trust, and student empowerment. It is this ethos that enables students to develop transferable skills beyond those of teaching abilities. The Southampton NPT programme adopts a pedagogy first approach and has subsequently published several studies indicating effective knowledge gain following NPT sessions equal to that of faculty-led teaching sessions. (8, 17, 25) These studies have also demonstrated successful learning in an interdisciplinary context and show that students consistently prefer NPT led sessions to faculty teaching and perceive the sessions as more engaging, interesting and exciting. (8, 17, 25) Other examples of successful NPT programmes include using third and fourth-year medical students to teach musculoskeletal ultrasound, (14) and fourth-year students to facilitate diversity-focused case-based discussions. (15) The latter example further illustrates an additional advantage of NPT, in that NPT may be used to facilitate socio-cultural diversity training.

A key aspect of NPT relies on faculty members working in a partnership model of co-creation with the students. For this slightly unconventional and innovative approach to be successfully integrated within the curriculum, educators must first identify how much resistance they may be facing from their faculty and how they will ensure a degree of quality assurance. Consequentially, an important consideration when implementing NPT is deciding whether an NPT programme will lie parallel to the current curriculum or act as an official part of it. (12) Understandably, some institutions may be risk-averse to incorporating this within the curriculum, but the partnership model is now becoming more established as good practice, (13) and so the authors are hopeful that a cultural change will follow.

When observing the natural evolution of the Southampton NPT programme, it aligns well with the values of equality, diversity, and inclusion. Within this NPT programme, student teachers come from the standard five-year medical programme, the widening participation entry to medicine and graduate entry programmes. Selection is not based on academic ability or a specific stage of training; student teachers are selected based on their interest in the subject and their willingness to participate in the required teacher training. However, those who enjoy learning neuroanatomy are likely to perform better in assessments. Typically, all near-peer teachers have two years of experience in clinically applied anatomy, and all selected students must attend at least one two-day NPT training course run by the faculty. This ensures a diverse range of student teachers who can bring their own skills and perspectives to their teaching sessions. This may lead to an overall better understanding of attitudes towards diversity-related issues within health care. (15)

NPT is now becoming relatively well understood in medical curricula, which is why sustainability is important and worthy of discussion. (16, 17) NPT is a direct extension of reflective practice as it creates a dynamic interaction between two individuals and does well to acknowledge that teaching is not a one-way linear transfer of knowledge but rather a complex and dynamic two-way interaction. (7, 18) NPT also actively involves individuals in the process of learning and knowledge construction. This encourages medical students to become autonomous and take responsibility for their education. Therefore, NPT can be considered as a form of constructivist learning. (19) This teaching method requires students to be active participants in their learning and encourages them to engage with planning, setting educational targets, organising and re-organising their knowledge; thereby also applying some of the key concepts related to the educational theories of both behaviourism and cognitivism. (16, 19)

THE ADVANTAGES OF NPT

Some benefits of NPT have been briefly mentioned already but are multifaceted and apply to all parties involved – the teacher, learner and faculty. (20) Additional teaching sessions and the opportunity to participate in education means that benefits to the teachers and learners are somewhat obvious. However, what may be less clear is that at the faculty level, NPT means that teaching pressure is often alleviated, and teaching resources are increased at little to no extra cost. In addition, curriculum time for basic science teaching is commonly reported as receding (21), and so NPT can focus on areas of education that the faculty are unable to attribute adequate time towards. NPT can afford to revisit challenging concepts that many students do not understand the first time in a fast-paced teaching schedule. When NPT is applied to the most difficult medical topics, it has been demonstrated as being particularly effective. (22) One example of this is its ability to help alleviate the phenomena of 'neurophobia'. (8, 22) This is something that many

faculties have struggled to address in the past and can eventually lead to cohorts of graduates who lack confidence in, or try to actively avoid, dealing with neurological cases. (8, 22)

At surface level, NPT is of direct benefit to the teacher since it aligns with the well-known phrase of Socrates' docendo discimus' (by teaching, we learn). (16) However, NPT also encourages self-appraisal and reflective practice as well as developing leadership, public speaking, and teaching skills. NPT also provides teachers with academic and research opportunities and the chance to develop one's CV and portfolio. (20, 24) It has previously been evidenced that involvement in NPT directly results in trainee doctors gaining points for their foundation programme applications. (9) Additionally, participation in NPT assists teachers in confidence growth, and it has also been reported that involvement in NPT results in an improved understanding of the content and a greater passion for the subject area. (9, 23) Lastly, NPT has been shown to increase a teachers' intrinsic motivation, which is often considered distinctly more valuable than extrinsic motivators such as assessments and examinations. (11)

At the student learner level, NPT provides a less formal, more engaging learning environment that students tend to prefer, which has been evidenced to benefit both perceived learning gain and actual learning gain. (8, 17, 20, 24) This data is taken from studies including applications of NPT within general practice, pathology tutorials, neuroanatomical education, and within an interdisciplinary educational setting. Within these studies, near-peer teachers vary in their level of training, position along their own educational pathway and degree of teaching experience. Despite this heterogenicity, student learners are consistently shown to benefit from improved long-term knowledge retention and often develop a superior understanding of the material. Qualitative feedback studies using mixed-methods approaches also suggest that student learners often prefer NPT sessions to faculty-led sessions due to the creation of a less formal environment in which the students feel more comfortable asking questions. (8) Finally, student learning is often greater in NPT sessions as the students believe that the teachers explain the content in a clearer manner, are more informed on student issues, and are more approachable. (8)

However, a few limitations have been associated with NPT. In some instances, student learners do not value the teaching from non-professionals as highly. (25, 26) Studies have even suggested that "learners with prior knowledge" can prove problematic due to a potentially complex power relationship between peer teachers and students. (25, 26) Additionally, student teachers can suffer from increased nervousness and a lower level of clinical understanding, which, when considered alongside reduced clinical experience, may result in an inability to answer questions in depth appropriately. (4, 9, 25) Moreover, consistent quality control can be challenging, which results in inter- and intra-institutional variance in the quality of NPT. (10, 26) The content and curriculum coverage provided by the near-peer teachers can also be much more variable, and there are often concerns regarding near-peer teachers sharing incorrect or misinterpreted knowledge. (25,26) Finally, despite the more informal learning environment created during NPT sessions lending itself to a more engaging and communicative learning experience, a faculty member's absence has been suggested to potentially disengage students as the learning sessions appear less important. (25, 26) NPT must be integrated into a sustainable partnership model between students and the faculty to address these limitations. This model enables quality assurance and provides the opportunity to monitor a formal NPT curriculum, which in turn ensures that the student teachers have sufficient knowledge, high-quality resources, and the appropriate training to mitigate these risks. (8, 12)

UNDERLYING PEDAGOGICAL PRINCIPLES

Despite these potential limitations, NPT is underpinned by several educational theories and should not be considered a novel or irresponsible approach to education. (27, 28) Instead, it should be considered a coherent, robust, evidence-based solution to the current discrepancies that exist between what is required of medical students and what is currently provided to medical students in modern medical curricula. The educational theories supporting NPT predominantly reside around cognitive and social congruence concepts. (27, 29) These theories are briefly outlined below:

- Cognitive congruence, as applied to NPT, is the sharing of a similar knowledge framework between student and teacher, which enables the teacher to use their own learning experiences to anticipate the issues that students may face and therefore deliver more individualised teaching. (8)
- Social congruence is the sharing of mutual interpersonal characteristics which result in improved communication within educational scenarios. Social congruence, as applied to NPT, explains why students feel more comfortable when being taught by their peers. (16, 27)
- Constructivism is a teaching strategy based on the belief that students learn best when they gain knowledge through exploration and active learning. Within NPT, students are encouraged to think and explain their reasoning rather than simply memorising or reciting facts.
- Partnership learning involves treating all members of the educational setting as intelligent and capable members of the academic community. It is a process for developing engaged student learning and teaching, in which all involved stand to gain from the process of learning and working together. It is distinct from listening to or consulting with students as it is about applying well-evidenced and practical approaches to learning, teaching and assessment with a commitment to open, constructive, and continuous dialogue.

Research and scholarship regarding NPT have become plentiful. Despite this, however, due to a lack of wider institutional recognition within formal curricula, the findings are often limited to single centre studies that mainly report student satisfaction rather than the impact on learning. This most likely contributes in some part to why it is yet to become an integral part of medical education. (30) There are a few high-quality studies that support the application of NPT within medical

education and demonstrate that in specific contexts, NPT improves student perceived and actual knowledge gain, enhances the educational experience of the student and teacher and reduces learning-related anxiety. (8,17,27) These positive outcomes are consistently being further supported by a wider range of examples from other disciplines and educational environments.

CONCLUSIONS AND RECCOMENDATIONS

Put simply, sufficient opportunities to develop teaching skills required of undergraduate and postgraduate medical students do not exist in their current training. Consequently, students are forced to seek such opportunities by looking beyond the restraints of their formal curriculum.

The authors suggest that it is now the responsibility of senior educational leaders and policymakers to facilitate the transition of NPT from a well-evidenced but informal educational strategy to that of a formal integrated curricular component. It would be sensible to begin implementation in areas of the curriculum which currently possess the most evidence for near-peer teaching's successful integration – namely, small group tutorials, anatomy practicals, clinical skills and nervous and locomotor education. Furthermore, organisational recognition of the benefits of NPT, such as specific reference and point allocation within foundation post applications, would serve further to incentivise participation and engagement within these mutually beneficial initiatives.

Upon implementation, this review recommends that a formal teacher training programme between years two and three would help ensure the quality of teaching and ameliorate common faculty concerns. Finally, this article recommends that formal initiatives to educate students and faculty members on the underlying principles of NPT should be undertaken so that greater awareness and more informed decisions regarding NPT can be developed.

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