How does attending PowerPoint free peer to peer teaching impact student experiences at medical school?

Claire Keith[2], Katherine Owen[2]

Corresponding author: Ms Claire Keith c.m.keith@warwick.ac.uk
Institution: 2. University of Warwick
Categories: Medical Education (General), Students/Trainees, Teaching and Learning

Abstract

Background

Student-Seminars is a small group teaching project where second year medical students teach first year students, using whiteboard drawings and interactive activities to facilitate understanding of concepts in a non-threatening setting.

Methods

Convenience sampling was used to recruit participants who had attended Student-Seminars. Three focus groups were held with six participants each to discuss academic and non-academic topics. Data reached saturation and themes were identified with an inductive approach using NVivo software.

Results

The slow pace and interactive teaching style aided understanding of concepts. Whiteboard teaching was preferred over PowerPoint as it was engaging and presented information in an easy to understand way. Students reported improved wellbeing due to the pastoral support of second years and increased confidence and motivation.

Discussion

PowerPoint is a mainstay of teaching in medical education. However, the success of Student-Seminars results from the innovative teaching methods and friendly learning environment created. This not only enabled greater depth of understanding but also positively impacted students’ wellbeing.

Conclusion
Student-Seminars are an easily implemented, peer learning strategy that aids understanding of complex topics. The preference for whiteboard teaching over PowerPoint could be considered generally in medical education to improve dissemination of knowledge in small group settings.

**Keywords:** Peer teaching; Undergraduate; Small group; Teaching styles; Student support

**Introduction**

Peer to peer teaching and near peer to peer teaching can be beneficial for both the teacher and tutee in medical school settings (Yu et al. 2011). The unique relationship of junior and senior students allows more than just information exchange (Tai et al. 2016). Senior students have a "greater awareness of the curriculum and assessment requirements" as compared to faculty as they have recently been in the exact position of their tutees (Burgess et al. 2016). They show greater cognitive congruence with the students they teach, enabling them to teach at an appropriate level (Nelson et al. 2013) and anticipate potential problems in understanding (Lockspeiser et al. 2008). Peer assisted learning has been shown to improve both cognitive and psychomotor development (when teaching clinical skills) (Secomb 2008). It also enables students to learn in a supportive environment, where rapport can be established quickly (Burgess, et al. 2016). Social congruence enables tutees to feel less intimidated when being taught by their near peers (Ten Cate and Durning 2007a), enabling a stress free environment for learning, in particular, study skills not normally addressed in formal education could be passed on (de Menezes and Premnath 2016). Beyond the academic benefits, peer teaching has been shown to foster a sense of community within a medical school (Menezes et al. 2016), develop teamwork skills (Scicluna et al. 2015), improve confidence (Field et al. 2007, Tai, et al. 2016) and increase motivation to study (Topping 1996).

PowerPoint is almost universally used in lectures within medical schools and is preferred to the traditional lecture format for large group teaching (Amare 2006) and has been found to provide comprehensive notes and highlight what students need to know. However, it has also been shown to have a number of negative qualities (Kernbach et al. 2016) which may be more relevant to small group teaching sessions where the choice of teaching methods is wider. When compared to whiteboard teaching, students found whiteboards better for comprehension and more likely to hold their attention (Rudow and Finck 2016).

This article investigates the reported effects of the student initiative ‘Student-Seminars’ on first year participants. Student-Seminars was set up, by myself, as a peer to peer learning opportunity specifically aimed at creating a healthy environment to learn. I found that after attending alternate peer support options with large group sizes and mainly didactic teaching and PowerPoint quizzes, I often felt stressed and unconfident in my abilities. My aim for Student-Seminars was to create a supportive environment that used interactive teaching techniques to help participants to understand topics, rather than testing their current knowledge.

Sessions involve two second year medical students teaching small groups of up to twelve first year students weekly for a five-week block. This programme runs alongside core teaching from the medical school, complementing prior learning by focusing on breaking down difficult concepts. Drawing on the whiteboard and interactive games and activities are the predominant teaching methods used. The aim of having small, consistent groups was to build relationships between participants and tutors. This enables students to feel comfortable asking questions or requesting alternate explanations. Banning PowerPoint served to encourage innovation in teaching methods that would slow the pace of the session and increase student involvement. These key features distinguish Student-Seminars from other peer learning opportunities at WMS. This study aimed to evaluate the perceived academic
effects and social and well-being effects of peer to peer learning in Student-Seminars and to investigate the students’ opinions on teaching methods, particularly the absence of PowerPoint in Student-Seminars.

**Methods**

Institutional ethical approval was obtained for the study. Participants were recruited on a voluntary basis using convenience sampling via social media and by directly approaching students in the medical school. Only students who had attended at least one block of Student-Seminars were included. They were given a participant information sheet and consented prior to participation. Three focus groups with six participants in each were held at Warwick medical school during lunch breaks, lasting between 30-45 minutes each. Sessions were facilitated by the author and 3 other students. Focus groups were semi-structured with questions to cover the key themes - learning style, teaching methods, academic and non-academic impact (Appendix 1). Each session was audio recorded and transcribed by the researcher.

Thematic analysis of three themes and fourteen subthemes was conducted using NVivo software by the author. An inductive approach was used so that unexpected themes could be drawn out of the data. Data reached saturation with no new themes emerging from the third focus group. Due to the scope of the project the data was only analysed by the researcher.

**Results**

The main themes we will explore are the academic impact of Student-Seminars, the non-academic impact - such as social and wellbeing effects - and the perceptions of teaching styles used. The subthemes are detailed in table 1.

**Table 1: Focus group themes and subthemes**

| Themes             | Subthemes                           |
|--------------------|-------------------------------------|
| Academic Impact    | Understanding Concepts              |
|                    | Remembering Details                 |
|                    | Impact on 1st Year Results          |
| Teaching Styles    | Whiteboard vs PowerPoint            |
|                    | Positive Areas                      |
|                    | Areas to Improve                    |
| Non-academic Impact| Wellbeing                           |
|                    | Social effects - Year 2             |
|                    | Pastoral Role of 2nd years          |
|                    | Social effects - own cohort         |
Motivation
Structure and Time Management
Confidence
Teaching Skills

Academic Impact

Understanding Concepts

Small groups aided understanding as seminars could be adapted "specific for my needs" covering topics that the group had requested. "Different presentation of the same information" enabled participants to grasp concepts that in lectures they had initially not understood with learning methods that they "would never have thought to do". The ease of asking questions was particularly important in enabling students to gain the necessary information to improve their understanding (Table 2).

The experience of the tutors came out as particularly important for aiding learning:

"It's just useful having it from someone who'd been there before the previous year, who's gone through the process. They're not trying to explain it in terms of the academics teaching us explaining it, they're explaining it in our terms and it's just a lot easier to understand than it necessarily is otherwise."

The seminar tutors could highlight areas of importance, due to their recent experience in the same position as the tutees. It was also noted that the tutors "try to link it to the clinical side" more when compared to some of the lectures, as they relate information to their recent experiences in hospital. Exam preparation was also aided by tutors' recent experiences as "they know the style of questions, the breadth and depth of the questions".

Remembering Details

Some students found that Student-Seminars helped them with remembering the details of topics, through using "memory tricks", acronyms or quizzes. However, most people put the increased memory down to an increased exposure and repetition of the topic or because their increased ability to understand a topic enabled better recall of the relevant details (Table 2).

Table 2: Quotes from Focus Groups -Understanding Concepts and Remembering Details
| Understanding Concepts                                                                 | Remembering Details                                                                 |
|----------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| It was about like different presentation of the same information - so it was like ‘Oh we covered this in the lecture but that made no sense’, but now they've explained it like this, or drawn it out like this, or sort of given you a bit of basic knowledge first and then explained it. That's just what helped me I think the most | For me I find understanding the bigger picture helps me fit the details in easier and I see where they fit and that helps me remember the smaller details, whereas I think that sometimes in the lectures they start with the details and forget the bigger picture, whereas I prefer to go the other way around because I find it just fits together better. |
| …because it's only a small group, being able to stop, being confident enough to say 'Hang on, I actually don't quite get that’ whereas you can never do that in a lecture setting | I could remember things so much easier and I don’t know about you guys, but I thought the little bits that I may have forgotten to go over myself got picked up. So, kind of like, like greater exposure to bits of the course, that, cause there’s just so much of it. |
| I think they really help my understanding of things, like particularly for attention because, like you said, when you're building on, when you're webbing it, starting from first principles and building up it's much easier to retain than just sort of random bits of information. | Also, I think quite a lot of the time they kind of gave you ways of remembering things, like acronyms or that sort of thing, that were quite helpful, which you wouldn't necessarily be able to come up with on your own- so I found that really helped me. |
| Negative/Indifferent                                                                    | Negative/Indifferent                                                                   |
| Past exam questions are how I learn best. And so, that was quite useful because it highlighted concepts that I wasn't clear on but I wouldn't have said that those sessions cleared them up for me. It was more, I then knew what I didn't know and I went off and studied it myself. | I think for me, it was less about the details actually and more, the details I could do later once I understood, for me it was nearly always about coming away from that lecture thinking ‘Oh my god, I have no idea about this topic’, going in, yeah, getting the basics done and then I can do details on my own. |
Impact on 1 Year Results

Some students thought there was a direct correlation between attending Student-Seminars and passing exams whereas others found the main identifiable difference was that they felt more confident in approaching exams (Table 3).

Table 3: Quotes from Focus Groups -Impact on 1st Year Results

| Positive                                                                 | Ambivalent                                                                 |
|-------------------------------------------------------------------------|---------------------------------------------------------------------------|
| I think that there's no way I would have passed that first year without Student-Seminars and Peer Support. | It's really difficult to say because I used them the whole time so I've not even got like a block where I didn't use it to compare, sort of like, how well I did so I'd say I think they helped but I couldn't back that up in any way. |
As a resitter, I think it definitely helped me to pass, because it kind of taught me to draw things out and in my first time around I didn’t draw enough at all and I think that’s why I’m still here because of the drawings that I can remember from Student-Seminars.

I’d like to say yes, but obviously, there’s so much material and it was only 1 hour a week, or 2 hours whatever it was, so I don’t know if it would have made like a significant difference in passing or failing or getting 5% more or less sort of thing, but definitely made me feel a bit more confident and I did find it was one of the more useful one or two hours of the week compared to working independently.

We had a whole session that we didn't do any teaching and it was purely exam technique, which I found really useful because we don't get past papers at all, so you don't really know what to expect and I found having that session gave me a really good process and strategy to work through the questions and I ended up doing quite well in my first year, so I think that did help.

Also, there was quite a lot of like end of block quizzes, type thing, like you said before and you just see the type of questions which might be in the exam, because the second years have obviously done the exam so they know the style of questions, the breadth and depth of the questions and they were good to revise from at the end of the year then.

### Teaching Style

**Whiteboard vs PowerPoint**

The aim of Student-Seminars was to use interactive teaching techniques that engaged students and enabled sessions to be held at a pace that encouraged understanding. The one rule of Student-Seminars was ‘No PowerPoint’ as it goes against the aims of the project. The students had an overwhelmingly positive response to this learning style, finding it was engaging, memorable and created a better atmosphere for learning (Table 4). It was thought that explaining via the whiteboard required a better understanding of the subject by the tutor which led to improved teaching:

"It also makes the teacher understand it better as well because they've had to think it out carefully and they don't have that aid and so they're likely to deliver it in a way which is easier to remember because they've got to remember it themselves."

PowerPoint is used extensively in teaching which has led to students experiencing PowerPoint fatigue, desensitising them to learning in that style. Although images are necessary for teaching some subjects, such as X-ray
interpretation, generally PowerPoint is not viewed as the most useful learning tool:

"PowerPoint is- if it's done well, if it's done right, it does give you a sort of safety net but at the same time, I don't think you can actually ever really truly kind of get a good learning experience out of it. It's sort of mediocre all the time"

There were however some downfalls of interactive techniques. Although slowing down the pace can be useful for understanding, for easier topics it was considered an inefficient use of time. In addition, interactive techniques do not always provide easy to revise from notes and may not be suited to teaching some topics.

### Table 4: Focus Group Quotes -Interactive Techniques and PowerPoint

| Interactive Techniques                                                                 | PowerPoint                                                                                                                                                                                                 |
|----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Yeah the interaction, like so when you don't have PowerPoint it's just generally, generally much more interactive. That's what I just liked, you know them drawing it, you drawing it, asking questions, like getting feedback -stuff like that. | In our CBL sessions, I’ve, you know, sort of dictatorial style move- I've instituted a ban on PowerPoint because I find it just encourages people to do half assed presentations that they've done in the 20 minutes beforehand and they're just doing it to, you know… |
| I liked learning from the board and having someone start with a blank board and then building it up, I prefer that to PowerPoint and I'm much more likely to be attentive than when it's in power point I think. And then It's a bit more of a cordial atmosphere as well when you are actually up there making an effort and talking at the same time as your drawing, so yeah I preferred it. | PowerPoint is- if it's done well, if it's done right, it does give you a sort of safety net but at the same time, I don't think you can actually ever really truly kind of get a good learning experience out of it. It's sort of mediocre all the time, whereas I think if you don't understand a subject and you tried to get up on a whiteboard or use another method, if it hasn't been prepared then you just kind of fall flat, but if you do put the time and effort in you can achieve a lot better results with it. |
| It also makes the teacher understand it better as well because they've had to think it out carefully and they don't have that aid and so they're likely to deliver it in a way which is easier to remember because they've got to remember it themselves. | It depends what you're teaching as well, so like if you were going over how to interpret an X-ray or something like that, then you're going to need the computer for something but it's, I guess it's how you use it- whether you use it as just like a reference and you sort of look at this one and then you go back, rather than just relying on it and having all the text on there and stuff. |
| It makes them pace it better, because you can’t rush through it if you’ve got to draw it out, and so it's good to like, force you to slow down. | If you didn’t get something through passive learning the first time it’s unlikely to work the second. |
Additional Positive Areas

Students found the variety of teaching methods aided their understanding and attention. In the first block, when students were completely new to medical school they were grouped according to their previous degrees. This created a good environment for learning with everyone starting from the same base level. The small groups were particularly beneficial as they increased the student's confidence to ask questions. The flexible nature of Student-Seminars being held on multiple days enabled more people to participate, despite their other commitments.

Table 5: Focus Group Quotes -Positive Areas

| Area               | Quote                                                                                                                                 |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| Teaching Style     | For the first few weeks I went we had quite a lot of board and diagrams and stuff, which was helpful, and question and answer. But then we did stuff, yeah like cut and stick and like, moving things around and stuff like that, so that was quite helpful when they started to kind of branch out a bit. The more varied the better to be honest because it's easier to remember I think. |
| Group Dynamics     | It's more personal isn't it, I liked it small because there's more sort of interaction, there's more, sort of, process for feedback and there's more of a dynamic environment. So, I mean I've got an awful attention span, but I managed to stay more attentive and more awake in Student-Seminars than I did in probably any of the lectures last year. |
| Flexibility        | Being able to pick your day that you wanted to do as well was good because you could fit it around your, I don’t know, sports or whatever you wanted to do. |

Areas to Improve

The focus groups brought up several areas for improvement for Student-Seminars, the main ones being the varying quality of teaching and time management within each of the sessions (Table 6). Topic selection was guided by requests from the 1st year students, however they have expressed a preference for tutors to choose topics as they were "overwhelmed by the amount that we were trying to learn". It was also requested that there could be a central point where resources across all seminar groups could be shared for additional study.

Table 6: Focus Group Quotes -Areas to Improve

| Area     | Quote                                                                 |
|----------|-----------------------------------------------------------------------|
|          |                                                                        |
| Time Management | I also found some of them were quite long, like I wonder if it would be helpful to have like a cap at an hour and a half or something and obviously if you’re in the middle of something keep going, but like some of them went, like over 2 hours and my attention span is not that long. |
|------------------|----------------------------------------------------------------------------------------------------------|
| Organisation of Resources | What I found quite hard was there were so many different, like when we did get on to questions, there were so many different banks and folders of questions everywhere. It would be really good to just have 1 big resource of questions where like everything gets put from everybody, because it seemed that different teachers would put them in different places and stuff. So, we all kept swapping them round anyway, you might as well just have them all in one place. |
| Teaching Skills | There’s, I think for one of the blocks in particular, the people who were leading it every week they just basically stood at the front and they didn’t really get you to participate that much and I found those sessions much less helpful because I just ended up not really paying any attention, because they weren’t actively encouraging us to participate in the session. |
| Topic Selection | I think like, proactive teaching as well because in a lot of ours they would like ask the suggestions on what to teach and no one would say anything because everyone was so overwhelmed by the amount that we were trying to learn that it was like ‘there’s so much stuff that I don’t know, I don’t know what to ask them to teach’ so although it’s really difficult for the teachers to then pick topics that they think, sometimes it’s kind of necessary, they just had to be like ‘right, you’ve got so much to learn, this is what we think is important, if you have any other suggestions let us know. |
| Group Dynamics | I think group size as well is quite the deciding factor. If the group gets big you end up getting stuck on sort of nitty gritty bits because someone might have a concept in their head that they want to, sort of, get to know a bit more of something more complicated, whereas actually some other people literally just want the basics and then build from there and I think, obviously with that spectrum of knowledge that you get, I think the larger the group obviously the larger the spectrum is going to be, but if it's smaller you can sort of say well, we can talk about that in a bit but…and then it's sort of easier to keep it moving, rather than getting stuck on a certain point. |

**Non-academic Impact**

**Confidence, Wellbeing and Social Effects**

Students reported a variety of non-academic ways that Student-Seminars affected them, as detailed in Table 7. Student-Seminars helped students gain confidence in both their subject knowledge and their ability to speak up and ask questions in teaching sessions. They provided structure to the student’s week, which was particularly beneficial during the Easter revision period as it ensured that students interacted with others, having a direct effect on their wellbeing. As well as being tutors, the second years were seen to provide "a lot of pastoral support" for the first years, who felt able to talk to them and obtain relevant advice on revision and exam preparation. They also offered insight into what the next year of the course involved. Student-Seminars helped to build social relationships both between cohorts and within the students’ cohort.
Motivation and Time Management

Motivation was a key subtheme to come out of the focus groups. Student-Seminars enabled participants to become less overwhelmed by the subject material, and acted as a trigger for further study during the week.

"… because it had been explained to me, you know, in a way that I understood, it made me motivated to, sort of, carry on doing that learning at home as well."

The set time of Student-Seminars each week allowed students to plan their studies around it. Some students also used the experience of interactive teaching techniques and incorporated it into their own teaching style, such as during their CBL groups. In addition to this short-term motivation, the contact with second years made them excited for the next phase of the course.

Table 7: Focus Group Quotes -Non-Academic Effects of Student-Seminars

| Non-Academic Effect | Quotes |
|---------------------|--------|
| Wellbeing           | I think towards exams as well, it also helps you get out, cause you have a tendency just to sort of sit on your own in your room or something, just going through stuff over and over again and you do start going a bit crazy. So, if you have something, that you know on a Thursday night or something you're going to see another 10 people, it probably is quite good for your sanity. |
| Social -Contact with Second years | I think it was quite nice having the contact with someone in second year because quite often we could ask them questions about, like, what they've been doing particularly in CCE1 because we don't - like I have really no idea what second year really involved so it was quite nice being able to find out about that sort of thing like from them. |
| Social -Pastoral Role of Second Years | It also served as a chance to actually…be in close proximity to people in the year above for a sustained amount of time and talk to them about other things like- how they dealt with, you know, revision and stresses of things and like asking their advice on how to do things and then also, you build up more of a personal relationship with them, so you can then talk to them outside more as well -which I think was really good. |
| Social -Own Cohort | Speak to other people in your year which you didn't necessarily speak to very much otherwise and sort of gauge how they're doing as well and just, yeah, rather than going home and studying, or going to the library and study, it was just another environment to do that. |
Motivation

For me, one thing that it helped with was not being overwhelmed by just the enormity of what we had to know. I often suffer from ‘There’s so much, I just don’t know where to start’ and then I don’t do anything and just getting off the ground and doing one hour where it’s really productive and helpful makes it seem more doable and then I’m more likely to be motivated to do more in the week outside of that. So, it has sort of a positive effect on the rest of my studies outside of that one hour, or two hours.

Confidence

I think it made me more confident in asking questions as well, in general really, because it’s easier to in a smaller group, to ask questions and you can get responses and before I probably wouldn’t have asked as many questions as I do now.

Structure and Time Management

You know it was time in the evening that I don’t know about everyone else but for me it was usually dead time - so it was time that I could actually work. I felt like I’d done something good and go home and feel like you’ve actually done something decent today.

Teaching Skills

You kind of get an idea about what works for teaching, what doesn’t, what you like, what you don’t -and actually kind of, almost kind of get to develop your own style a bit. I found that, you know especially with CBL and things like that, I’ve changed the way that I do things sometimes and with teaching sessions that I’ve done following on from it.

Discussion

Through conducting focus groups, we found that there was an overwhelmingly positive response to Student-Seminars, in particular, for aiding understanding of topics. The literature has previously shown peer-assisted learning to be a valuable learning tool (Bulte et al. 2007) and this is supported by this study. We also found a substantial range of non-academic effects experienced by students, in particular the pastoral role of second years (Ten Cate and Durning 2007b). Strengths of the study were data saturation and the inductive approach enabling discovery of unexpected themes. Limitations were the potential influence of the author on the focus groups and being the sole coder.

Academic Effects

As adult learners, all participants in Student-Seminars were actively volunteering their time to seek knowledge. This may make them more receptive to teaching but also makes them more aware of their needs and requirements for learning. The focus groups showed that Student-Seminars aided understanding more than memorising. Using Bloom’s taxonomy (Bloom et al. 1984), the seminars focused on the cognitive domain with comprehension being the main goal of Student-Seminars. The cognitive congruence of second years to first years enabled the seminars to focus on useful areas, and for tutors to naturally pitch sessions at the right level (Lockspeiser, et al. 2008).

The slow pace of Student-Seminars enabled learners to develop an understanding of a subject, rather than rote learning facts. Using teaching techniques such as drawing on the whiteboard meant that sessions could be adapted to students’ needs. Peer-associated learning has been found to promote learning due to the informal environment
encouraging disclosure when a student doesn’t understand (Hilsdon 2014). The small, consistent groups enabled relationships to form and created a safe atmosphere to learn. These factors enabled students to incorporate and consolidate knowledge in areas they had previously found difficult. Repetition of topics from lectures aided memory of details to a smaller degree.

In addition, Student-Seminars indirectly affected academic performance as students reported feeling increasingly motivated to study. The grounding Student-Seminars gave them in a topic made it seem more manageable and empowered students to do further individual study as well as identifying areas that needed more work. This suggests that Student-Seminars have ongoing academic effects outside of the sessions. Overall it is difficult to say whether Student-Seminars impacted year one results, but some individuals felt strongly that it had. Others found they had increased confidence as a result of attending seminars and that there had been a positive impact on their studies, but found it difficult to say whether it had made a concrete difference.

Social and wellbeing effects

Group unity can be a motivating factor for learning and encourages community formation within the medical school (Menezes, et al. 2016). The small groups enabled relationships to form both within the first year’s cohort and with second year tutors. Outside of sports and societies there is limited contact between year groups and Student-Seminars offered an opportunity for this interaction to occur. First year students learnt more about the progression of the course and had a source of advice from people who had recently been in their position.

The social side of Student-Seminars also impacted students’ wellbeing, particularly during the Easter revision break. Medical students have a tendency to feel guilty if they’re not studying and Student-Seminars allowed them to change scene and interact with other people, whilst still feeling that they were being productive. This further emphasises the additional benefits peer teaching has beyond that of the academic curriculum, and has identified that students have an increased need for welfare support outside of term time, which Student-Seminars can help to provide.

Teaching Methods

Student-Seminars encouraged tutors to bring their own innovative teaching methods to the sessions. These varied from standard whiteboard teaching to the use of props, interactive games, example exam questions and even dissection. Student participants felt overwhelmingly positive about this learning approach as it aided their understanding of topics and kept them attentive and interested in the session. This supports previous research that showed science students to find whiteboard teaching more engaging than PowerPoint (Rudow and Finck 2016). PowerPoint was felt to be overused in the curriculum, suggesting that a back to basics approach of drawing things out and using props to explain concepts could be beneficial to incorporate into medical school small group teaching. Supporting staff to develop alternative teaching methods would be in keeping with "flipped classroom" initiatives (Prober and Khan 2013). Furthermore, students are an underutilised resource that could provide high quality, individualised teaching within medical school curricula (Jackson and Evans 2012). This would not only be a very cost-effective way to provide small group learning but would enable senior students to develop skills in teaching that will be essential for their future roles as doctors (Ten Cate and Durning 2007b).
Recommendations

As a peer-run teaching programme the tutors have limited education in teaching techniques and time management. It would be advantageous to develop a tutor training programme to address these issues. Student-Seminars should have groups as small as feasible, matching students with arts or science backgrounds to tutors of the same. This may require increased incentives to attract more tutors. However, if numbers allowed it would be increasingly possible to match students with the relevant tutors, as this was only piloted for the first block initially. In future, topics should primarily be chosen by the tutors to allow adequate time for preparation, with the option for students to request specific areas of difficulty in addition.

The key features of Student-Seminars could easily be incorporated into peer teaching at other medical schools to benefit a larger population of students. At our institution, the project has been expanded to include third years teaching second years with an increased focus on clinical relevance. Beyond purely Student-Seminars, the findings of this study suggest that more interactive methods of teaching and learning enable greater understanding of difficult concepts. These findings are relevant to many areas where PowerPoint presentations are the main format of communication of information. This is particularly true for medical education, where so many topics lend themselves to whiteboard teaching and interactive activities. Medical Schools could benefit from reducing the proportion of PowerPoint based teaching and increasing small group interactive learning opportunities to further promote students’ learning.

Conclusion

Student-Seminars is a peer-run learning project at Warwick Medical School. It has provided wide-ranging academic, wellbeing and social effects for the first-year participants. The use of interactive teaching methods has been found to be an effective tool for learning that encourages understanding of difficult concepts. The small groups enabled sessions to be tailored to individual needs and promoted a supportive environment. This enabled links to be made between first and second years, who provided a source of support and advice in the run up to exams. The key features of Student-Seminars have been shown to create an effective learning environment that can be replicated for peer-teaching in the senior years at WMS and at other medical schools.

Take Home Messages

- Peer teaching has effects beyond academic impact, including improvements in wellbeing and motivation to study
- Interactive, power-point free teaching is preferred by students as a more effective method of learning that increases depth of understanding
- Students are a prospective resource for teaching that could be further utilised in medical education

Notes On Contributors

Claire Keith is a final year medical student at Warwick Medical School who founded the peer-to-peer learning project Student-Seminars as part of her role as MedSoc Education and Societies Officer. She won the JASME Student Innovation Award 2017 for her work.
Katherine Owen is Principal Clinical Teaching Fellow and Academic Lead for Learning and Teaching at Warwick Medical School. She is a practising GP and is interested in projects working with students and patients to improve medical education.

Acknowledgements

This work was supported by the help of the fellow students who co-facilitated the focus groups and the students who participated in the focus groups.

Bibliography/References

Amare N. 2006. To Slideware or Not to Slideware: Students' Experiences with Powerpoint Vs. Lecture. Journal of Technical Writing and Communication. 36(3):297-308.

https://doi.org/10.2190/03GX-F1HW-VW5M-7DAR

Bloom B, Krathwohl D, Masia B. 1984. Bloom taxonomy of educational objectives. Allyn and Bacon, Boston, MA. Copyright (c) by Pearson Education. Available from https://www.uvic.ca/services/counselling/assets/docs/Blooms%20taxonomy.pdf

Bulte C, Betts A, Garner K, Durning S. 2007. Student teaching: views of student near-peer teachers and learners. Medical Teacher. 29(6):583-590.

https://doi.org/10.1080/01421590701583824

Burgess A, Dorman T, Clarke AJ, Menezes A, Mellis C. 2016. Peer tutoring in a medical school: perceptions of tutors and tutees. Bmc Medical Education. 16:7.

https://doi.org/10.1186/s12909-016-0589-1

de Menezes S, Premnath D. 2016. Near-peer education: a novel teaching program. Int J Med Educ. 7:160.

https://doi.org/10.5116/ijme.5738.3c28

Field M, Burke JM, McAllister D, Lloyed DM. 2007. Peer-assisted learning a novel approach to clinical skills learning for medical students. Med Educ. 41.

https://doi.org/10.1111/j.1365-2929.2007.02713.x

Hilsdon J. 2014. Peer learning for change in higher education. Taylor & Francis Online. 51:3.

http://dx.doi.org/10.1080/14703297.2013.796709

Jackson TA, Evans DJR. 2012. Can medical students teach? A near-peer-led teaching program for year 1 students. Advances in Physiology Education. 36(3):192-196.
Kernbach S, Bresciani S, Eppler MJ. 2016. Slip-Sliding-Away: A Review of the Literature on the Constraining Qualities of PowerPoint. Business and Professional Communication Quarterly. 78(3):292-313.

Lockspeiser TM, O'Sullivan P, Teherani A, Muller J. 2008. Understanding the experience of being taught by peers: the value of social and cognitive congruence. Advances in Health Sciences Education. 13(3):361-372.

Menezes A, Burgess A, Clarke AJ, Mellis R. 2016. Peer-assisted learning in medical school: tutees' perspective. Advances in Medical Education and Practice. 7:31-38.

Nelson AJ, Nelson SV, Linn AMJ, Kildea HB, Tonkin AL. 2013. Tomorrow's educators... today? Implementing near-peer teaching for medical students. Medical Teacher. 35(2):156-159.

Prober CG, Khan S. 2013. Medical Education Reimagined: A Call to Action. Academic Medicine. 88(10):1407-1410.

Rudow SR, Finck JE. 2016. Pointing with Power or Creating with Chalk. Contemporary Issues in Education Research. 8(3):123-134. Available from http://files.eric.ed.gov/fulltext/EJ1069892.pdf

Scicluna HA, O'Sullivan AJ, Boyle P, Jones PD, McNeil HP. 2015. Peer learning in the UNSW Medicine program. Bmc Medical Education. 15:9.

Secomb J. 2008. A systematic review of peer teaching and learning in clinical education. Journal of Clinical Nursing. 17(6):703-716.

Tai J, Molloy E, Haines T, Canny B. 2016. Same-level peer-assisted learning in medical clinical placements: a narrative systematic review. Medical Education. 50(4):469-484.
Ten Cate O, Durning S. 2007b. Peer teaching in medical education: twelve reasons to move from theory to practice. Medical Teacher. 29(6):591-599.

https://doi.org/10.1080/01421590701606799

Topping KJ. 1996. The effectiveness of peer tutoring in further and higher education: A typology and review of the literature. Higher Education. 32(3):321-345. Available from https://link.springer.com/article/10.1007/BF00138870

Yu TC, Wilson NC, Singh PP, Lemanu DP, Hawken SJ, Hill AG. 2011. Medical students-as-teachers: a systematic review of peer-assisted teaching during medical school. Adv Med Educ Pract. 2.

https://doi.org/10.2147/AMEP.S14383

Appendices

APPENDIX 1: FACILITATOR NOTES

PARTICIPANTS TO SIGN CONSENT FORM ON ARRIVAL

Introduction
- Check everyone knows names
- All opinions useful
- Everything anonymised
- Mainly for you to be speaking to each other, rather than an interview format

Theme 1: How do you learn best?
- What learning styles work for you?
- How do you usually study?

Theme 2: How do you think Student-Seminars impacted you academically?
- How did Student-Seminars affect your ability to understand concepts?
- How did Student-Seminars affect your ability to remember details of topics covered?
- Do you think Student-Seminars affected your Year 1 results?

Theme 3: What did you think of the teaching techniques used in Student-Seminars?
• What worked well?
• What didn’t work well?
• What did you think about the absence of PowerPoint?
• How would you have liked to have been taught?

Theme 4: Do you feel that Student-Seminars affected you in any other ways?

• Were there any social effects?
• Was there any effect on your wellbeing?
• Any other way you feel Student-Seminars affected you?

Conclusion

• Is there anything not yet discussed that you would like to bring up in relation to Student-Seminars?
• Thank you for giving up your time to participate
• Create mailing list of people who wish to see the results of the study.

Declarations

The author has declared that there are no conflicts of interest.

This has been published under Creative Commons "CC BY 4.0" (https://creativecommons.org/licenses/by-sa/4.0/)

AMEE MedEdPublish: rapid, post-publication, peer-reviewed papers on healthcare professions’ education. For more information please visit www.medepublish.org or contact medepublish@dundee.ac.uk.