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Evaluation of medical student program with the use of a reflective portfolio: A qualitative study

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Abstract:

BACKGROUND: The concept of reflective practice is at the center of professional practice, allowing a bridge between theory and practice and learning from our own experiences in an ongoing process. Understanding what learners need such as regular observation of work, more responsibility, and technical and problem-solving with answers allows the teacher to help learners to progress to independence in pursuing their own learning needs. Therefore, it is important that medical educators continually reflect and evaluate teaching ability to meet learners' needs and provide evidence to support it.

MATERIALS AND METHODS: A prospective, qualitative study was carried out using a combination of questionnaires and observed assessments. The study participants consisted of twenty final-year medical students from King's College London and took place at a hospital education center in the UK, April 2019. Two educational sessions were delivered by a doctor to the study group and a video recording was conducted. The educator completed a reflective portfolio using feedback questionnaires, peer observation forms, and observation of the video recording, and the results were analyzed using a video critique tool.

RESULTS: Twenty learner feedback forms were completed, and a peer observation form was completed. This allowed a critical analysis of educator performance, reflection, and improvement. This was further solidified by in-depth analysis and critique of teaching session playback video.

DISCUSSION: This study evaluates a medical student teaching program using a reflective portfolio. This study confirms the effectiveness of using a reflective portfolio to enhance the teaching experience. Video analysis can be self-critical, however this study shows how it is useful to review human experience first-hand, and identifying any specific techniques that create a positive or negative change can enable educators to improve as time progresses.

Keywords:

Assessment, health care, medical education, quality improvement, reflection

Introduction

The concept of reflective practice is at the center of professional practice, allowing a bridge between theory and practice and learning from our own experiences in an ongoing process.^[1] Schon^[2] describes that formal theoretical knowledge obtained from a course is often not the best way to solve real-life problems.^[2] Instead, he describes "reflection on action" as a process occurring

after an event where the teacher analyzes the situation and what could have contributed to the unexpected and what can be learned in future.

Self-assessment is essential to ensure teachers maintain an optimum role.^[3] In addition, it is also important to consider how others perceive us as teachers.^[4] Understanding what learners need such as regular observation of work, more responsibility, and technical and problem-solving with answers, allows the teacher to help learners

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to progress to independence in pursuing their own learning needs.^[5] Therefore, it is important that medical educators continually reflect and evaluate teaching ability to meet learners' needs. Medical professionals are very familiar with using structured assessments in clinical activities, however they often struggle with the idea of reflection as understanding and making sense of a particular event is a challenging task in itself. It involves being able to challenge one's own beliefs and assumptions which may need to be changed depending on the encountered situation.^[6] Of these, the toughest to change are those that involve "self-beliefs." Reflection involves an emotional journey, often forcing oneself to feel sadness or shame in order to gain a deeper understanding to learn from a situation.^[6] In addition, there are situations where one may not be able to reach their full potential for reflection without the help of another.^[6] To do this continually throughout a teaching career is a difficult task, especially without a formal structure. A structured multimedia feedback approach through written questionnaires, peer interviews, and video analysis with self-observation in keeping with a reflective portfolio of evidence may be able to address the above requirements by allowing multiple assessments and viewpoints in different modalities. This technique may, in turn, improve the rewards to be gained from reflection.

Materials and Methods

A prospective, qualitative study was carried out using a combination of questionnaires and observed assessments. The study participants consisted of twenty final-year medical students from King's College London and took place at a hospital education center at Dartford and Gravesham NHS Trust in the UK, April 2019. Two educational sessions were delivered by a doctor (2 years' post qualification) to the study group and a video recording was conducted. Two educational sessions were delivered and a reflective portfolio was created. A combination of methods, including questionnaires, observed assessments, and video critical analyses, was used for teaching evaluation.

Session A entitled "Prescribing essentials" and Session B "MRCS Part A Revision Course: Upper Limb" were delivered to twenty, fifth-year medical students. Session A was aimed at providing practical prescribing skills and knowledge for on-the-job doctor skills, whereas Session B was aimed at understanding anatomy and physiology with some tips for exam technique. Kolb's experiential learning cycle' stages^[7] were used for both session plans. Learning activities with resources such as drug charts were used in Session A and multiple-choice questions (MCQs) in Session B to allow practical real-life prescribing and mimic exam scenarios, a process which Kolb^[7] describes as "active experimentation"

which ultimately reinforces learning. A lesson plan [Appendix A] and PowerPoint slides were devised for both teaching sessions. For the learner evaluation, the questionnaire developed from the Joint Royal College of Physicians training board which was completed by each student immediately after sessions A and B with appropriate learner consent [Appendix B] was used. The data were compiled from each questionnaire into a form and critically analyzed. The educator completed a reflective portfolio using feedback questionnaires, peer observation forms, and observation of the video recording, and the results were analyzed using a video critique tool. Video analysis using the Pellegrino and Gerber video analysis critique^[8] was completed for Session A [Appendix C]. Peer observation form from the University of Nottingham was completed for session B [Appendix D].

Ethical statement

This study complied with the Staffordshire University Ethical Review Policy for 18028594/PPDE70284/2018–2019 dated June 21, 2019. Written informed consent was obtained from all participants. Participant confidentiality was maintained throughout the study.

Results

Twenty learner feedback forms were completed for Session A. Peer observation was completed for Session B [Appendix D]. Video analysis [Table 1] and a self-reflection [Appendix C] were completed by the educator for Session A.

Summary of learner evaluation forms

Session setting, facilities, etc.

Good-sized room and good IT facilities including projector and large screen. Drug charts and case-based scenarios to practice prescribing. Education center used with good facilities.

Were the objectives of the session identified and were these met?

Yes, objectives covered at the beginning and systematically worked through then all types of insulin regimes, clear and well structured. Very useful to think about case examples theoretically and in practice. These topics are not well taught at medical school otherwise Very interactive and lots of worked examples.

Was the delivery effective and clear? If handouts were used, were these useful?

Handouts and drug charts were useful. Clear PowerPoint and delivery. Understood very difficult topics that as a 5th year can be very daunting such as insulin prescribing. Short but informative slides. Maybe a little fast but understandably so as large topic. Good pace. Good use of active discussion and prescription charts.

Table 1: Summary of reflective analysis results using the video critique tool

Category	Score 1-5	Reflective analysis summary
1A: Subject specific content	4	Good knowledge, refined student mistakes
1B: Pedagogical content	4	Pitched at right level, brainstorming, consolidate previous knowledge
1D: Content connections	5	Relation to real life scenarios and exam technique
2C: Students' development	4	Paraphrasing and summarizing, checking understanding
2D: Classroom environment	4	Efficient time management. Lack of use of flipchart, further probing required.
3C: Classroom management	3	Better use of classroom furniture required, effort made to engage quieter students, no confrontations
3Ga: Communication	3	No communication errors
3Gb: Communication	3	Nervous initially, body language appropriate, use of silences
4C: Assessment	3	Eye contact maintained, ice breakers, verbal feedback, learning outcomes met
5B: Lesson plan and instruction	3	Discussed this prior with medical education department. Planned lesson with PowerPoint and teaching notes
5C: Instructional strategies	3	The strategies used to improve engagement included allowing time for learners to think, paraphrasing questions, simplifying or back-tracking questions to start from basics, non- verbal gestures, verbal reassurance, group work
5D: Monitoring and adjustments	3	Talking through process of understanding
5F resources	3	PowerPoint, Insulin cards, drug charts

Level 1=Indicator not demonstrated, Level 2=Indicator partially demonstrated, Level 3=Indicator adequately demonstrated, Level 4=Indicator effectively demonstrated, Level 5=Indicator exceptionally demonstrated (should not be used to evaluate student teachers, used only for experienced teachers who are consistently exemplary)

What aspects of the session were useful, i.e., were there learning and change of practice points?

Useful to have the opportunity to ask questions. Very useful, particularly insulin prescribing and how to adjust doses. Practicing prescriptions was useful. Discussions of the group answers were useful. Relevant and common presentations of patients.

Discussion

A reflective portfolio has been defined as a “the collection of evidence that attests to achievement as well as personal and professional development through a critical analysis and reflection of its contents’.^[9] The personal review of each evidence is how “showcasing of best work” is avoided an open and honest representation is presented.^[9] This study reviews a profile of evidence which exhibits efforts, progress, and achievement in (a) learner development, (b) evaluation of education, as well as (c) professional accountability. The use of video recording allows analysis in a transparent way therefore, learner and peer evaluation can occur openly and honestly. This study is a combination of reflections from learner and peer observations as well as self-evaluation with an underlying literature base.

Although criticized, PowerPoint to help ensure verbal expression of content was accurate and mistake free, which is essential for accurate comprehension of knowledge.^[10]

There may have been a lack of confidence as the educator was facilitating teaching sessions where the learners, particularly in Session B, may have similar or more clinical experience as the educator and therefore

may be likely to challenge the educator’s teaching. The assumption that “if someone knows a lot about a topic then they would be the best to teach it”, was challenged by Spencer.^[11] who said that “subject expertise is important, it is not sufficient.” Despite this, PowerPoint has been shown to be used to divert the attention of the audience and possibly minimize eye contact.^[12] Although it is important to consider the negative aspects of PowerPoint presentation such as neglect of interaction, high speed, irrelevant information, PowerPoint can be a useful tool when used appropriately.^[10] For example, in this study, it was used to benefit the learners with diagrams, pictures, and case outlines.

The teaching design for the learning was based on Knowles’ theory^[13] of andragogy and tried to focus the learning more on the process as opposed to content. Session A included case studies to create problem-based simulations for the learners as the “junior doctor on the ward” to carry out specific prescribing tasks. Experience provides the basis for learning activities, including any mistakes,^[13] and “on-the-job” skills teaching is at the core of clinical teaching.^[11] The group answers were evaluated as a whole, and short bursts of knowledge surrounding the case were provided. Real-life case studies were used as they tend to spark the most interest because they have the most immediate relevance to their job and study.^[13] Session B was primarily focused on the delivery of concepts, but to make this a more experiential as opposed to cognitive learning described by Rogers,^[14] spot-test style MCQs were used as activities in-between sub-topics to reinforce learning and allow self-initiated discussion, personal involvement, and deeper level of evaluation.

Handouts are generally well appreciated by learners in order to act as a summary of the session and active participation.^[15] However, for session A, handouts were not used because prescribing is not about memorizing knowledge about pharmacology but about the conceptualization of the patient.^[16] The educator wanted the learners to learn the underlying process of safe prescribing and use their clinical judgment and be able to apply the principles. Handouts outlining the case scenarios and answers would have been particularly dangerous if students rote learned specific answers from the handout. In hindsight, after reflection on the video analysis, perhaps a short A5 handout with the basic process of altering insulin prescriptions would have been useful, especially during the scenarios to brainstorm ideas.

Teaching style

Incorporating several approaches in a teaching session can be difficult. This proved to be much more difficult for Session B. This session was part of a “crash course;” a type of lecture-based learning which has been shown to be ineffective, however there is a pattern with doctors who have time-pressured environments to assimilate as much knowledge as possible, primarily to pass an examination.^[17] Memorization of key facts or “rote learning” can be misconceived as a surface learning approach,^[17] however, in this study, the educator ensured that the facts such as tendons in the hand were learned in order to explore why certain hand deformities occur. Without this application, Marton and Saljo^[18] suggest that students may focus on isolated facts and items are treated independently of each other. In session A, students already had an appropriate background knowledge for me to move onto the deep approach and focusing at a higher conceptual level by getting learners to actively prescribe and discuss treatment regimes. As the educator moved onto each case, there were further problems encountered which allowed students to then build on and adapt their learned structure. However, in session B, due to the heavy workload, high class contact hours, and a large amount of course material, this was more difficult.^[17] In this situation, to enhance the learning, the content was decreased into key topics based on previous examination questions and facilitated discussions surrounding MCQs.

Brainstorming and intermittent questions were used which targeted learners, however learning from mistakes is beneficial^[19] and contributes to the deep approach of learning not only for the student but also for other learners.^[17]

Evaluation

Evaluation through reflection on teaching can be broken up into three main areas, namely learner, peer, and

self-evaluation. A combination of methods including questionnaires, observed assessments, and video critical analyses was used teaching evaluation. For the learner evaluation, the questionnaire developed from the Joint Royal College of Physicians training board which was completed by each student immediately after sessions A and B was used. This is an evaluation questionnaire that has been used for many teaching sessions due to its practical, cost-effective, and easily accessible nature (Lovato and Wall, 2014). However, this particular questionnaire only focuses on the learning domain of Kirkpatrick's^[20] hierarchical evaluation of “reaction, learning, behavior, results.” Although it has open-ended questions which is how an ideal questionnaire should be devised,^[21] without a prompt for criticism, students may feel less inclined to comment on the negatives. In session B however, a posttest MCQ was able to better evaluate the “results” domain which can be more challenging (Spencer, 2003). Critics have said that Kirkpatrick's^[20] model is quite a narrow concept of outcomes, and possibly one involving context, lesson plan, teaching delivery, and learning outcomes would be better.^[22]

A “supported reflective practice” framework in the form of observed teaching and feedback on reflection on real-life teaching experiences was used which has been shown to be transformational of both perspective and practice.^[23] In order to build awareness of teaching approach, strengths, and areas for professional development as well as teaching skills, a specific evaluation tool was required such as the questionnaire designed by the University of Nottingham.^[24] In the past, peer observation has been somewhat unusual for higher education.^[25] The reluctance to engage may be due to seeing peer observation as a form of judgment about the level of competence,^[25] however Form 1 of the questionnaire sets out areas of feedback as well as objectives for the session. This helps reduce anxiety and stress surrounding the fact that a peer is observing the teaching.^[23] Form 2 is the observer's feedback, the main component whereby specific feedback can be received for teaching and skills. The effectiveness and credibility of this depends entirely on the evaluator, and Siddiqui and Jonas-Dwyer^[26] has highlighted “Twelve tips” for peer observation which include clarifying objectives (covered in Form 1) and resisting the urge to compare with the peer's own teaching style. The observer was chosen carefully, a colleague who is trusted and respected as it is important that there is familiarity to feel comfortable with constructive feedback on areas of improvement.^[27] Discussion and reflection (Form 3) is one of the most important aspects as it allows discussing particular “evidence” of the effectiveness of teaching as well as focusing on areas of improvement. Negative feedback can feel confrontational, however the

reflection and discussion can act to build confidence, stimulate self-evaluation, as well as allow professional relationships to be strengthened.^[28]

To complete the self-evaluation, video-recording analysis of the teaching session was used. This evaluation was based on a tool developed by Pellegrino and Gerber.^[8] It should be noted that there are other reflective tools that exist in the literature,^[29] however, video analysis allows greater awareness of student attention, dynamics of the class, as well as interaction with the students.^[8] There can be a tendency to be “hypercritical” of teaching while analyzing video, however video analysis allows the educator to see teaching from a new perspective and this method has been shown to be much easier than “reflecting in action.”^[30] The video instrument tool helps with the overcriticism as it gives a structure and formal assessment method.^[8] The process of reflection is personal in nature. A combination of measures of learner evaluations, peer observation, and self-evaluation generates the greatest reflective value.

Limitations

The study allowed a recording of human experience which led to a thorough and in-depth analysis of the teaching sessions, which would otherwise not have been possible through questionnaires alone. Although this study has been extremely useful in generating a substantial amount of data on the reflective activity of the educator, it should be noted that the educator was present throughout the data-gathering process and so this can impact the participants’ responses. In addition, the nature of the qualitative study implied that there were limitations in relation to researcher personal bias.

Future studies could involve multiple video critique analyses, by various “external third-party” assessors as well as the educator themselves. Larger sample sizes would be helpful in further consolidating our results

Conclusion

This study confirms the effectiveness of using a reflective portfolio to enhance the teaching experience. Video analysis can be self-critical, however this study shows how it is useful to review human experience first-hand, and identifying any specific techniques that create a positive or negative change can enable educators to improve as time progresses.^[27,31]

Creating a reflective portfolio also requires some level of support which can be sought from surgical tutors and supervisors as clinical duties and educational roles can go hand in hand.^[32] It is important that medical educators continually reflect and evaluate teaching ability to meet learners’ needs and provide evidence to support it.

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This study complied with the Staffordshire University Ethical Review Policy for 18028594/PPDE70284/2018–2019 dated June 21, 2019.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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Appendix A: Lesson Plan

MBBS Year 5 Student Teaching

Session Title: "Prescribing Essentials"

Details:

Group lecture and tutorial delivered to 24 students currently in fifth year of the MBBS at King's College London.

Date: 25th June 2019, 15:00 – 16:30
Venue: Darent Valley Hospital, Dartford and Gravesham NHS Trust
Participants: 5th-year medical students
Resources required: Computer and whiteboard for PowerPoint presentation, drug charts, calculators, evaluation questionnaire

Aims:

The aim of this teaching is to help students develop competence in common prescribing scenarios encountered on the wards as a foundation doctor.

Objectives (learning outcomes):

1. Understand body fluid distribution and relevance in fluid prescription
2. Explain and safely prescribe resuscitative and maintenance fluids
3. Apply the WHO pain ladder in pain management scenarios
4. Understand the basic principles of insulin types and regimes
5. Review and formulate individualized insulin management plans.

Lesson plan:

Beginning

Session time grid

Time	Content	Participant activity	Facilitator activity	Resources	Objectives
0	Introduction, ice breaker, learning outcomes, consent form	Listening and group interaction	Talking	PowerPoint, consent forms	

1. Introduction to the group
2. Outline baseline information about the group and expectations via an introductory ice breaker
3. List session plan, learning outcomes, house-keeping rules
4. Explain consent form and allow participants to fill in.

Main session

Session time grid

Time	Content	Participant activity	Facilitator activity	Resources	Objectives
10	Fluid management	Listening and question answering	Talking, lecture	PowerPoint	
	Fluid prescribing	Exercise in pairs	Answering questions	Drug charts, calculator	
	Discussion	Discussion and questions	Discussion and questions	PowerPoint	
35	Pain management	Listening and watching	Talking and demonstration	Participant volunteer	
	Analgesia prescribing	Exercise in pairs	Answering questions	Drug charts, calculator	
	Discussion	Discussion and questions	Discussion and questions	PowerPoint	
55	Break				
60	Insulin management	Ice breaker	Talking,		
	Types and regimes of insulin	Listening and question answering	Talking, lecture	PowerPoint	
65	Insulin prescribing	Scenario 1 in small groups	Answering questions	Drug charts, calculator	
70	Discussion	Discussion and questions	Discussion and questions	PowerPoint	
75	Insulin prescribing	Scenario 2 in small groups	Answering questions	Drugs charts, calculator	
80	Discussion	Discussion and questions	Discussion and questions	PowerPoint	
85	Variable rate insulin	Listening	Talking, lecture	PowerPoint	

1. Explain body fluid distribution and types of fluid using safe trial to compare and contrast crystalloids and colloids. Use this to explain resuscitative fluid management
2. Allow students to prescribe maintenance fluid on chart
3. Discuss maintenance fluid using 1x salty, 2x sweet and explain composition of fluid
4. Discuss pain management scenario and methods of management
5. Allow students to prescribe using drug charts
6. Discuss answers using WHO pain ladder and methods of prescribing morphine sulfate and oramorph
7. Briefly explain patient controlled analgesia
8. Brainstorm insulin types and categories
9. Explain and discuss purpose of each category and insulin card
10. Discuss the two main types of insulin regimes
11. Briefly review main insulin prescribing rules
12. Allow students to prescribe the two insulin scenarios
13. Discuss answers and options for management
14. Briefly explain variable rate insulin.

End

Session time grid

Time	Content	Participant activity	Facilitator activity	Resources	Objectives
90	Summary, reflection and feedback	Listening, writing and reflection	Summing up	Evaluation forms	
		Finish 2 min early!			

1. Summarize key points
2. Review achieved learning outcomes
3. Allow questions and reflection on the session
4. Completion of evaluation questionnaire.

Appendix B: Learner consent form

Learner Consent Form for Evaluation of Teaching Session

Teaching Session:..... Date:.....

Teacher:.....

Learner:.....

This teaching session will be video recorded for the purpose of staff development and will be submitted to Staffordshire University towards the achievement of the PgC in Medical Education.

The recording will be treated as confidential; it will not be labeled with your name and will only be submitted to Staffordshire University for assessment of the teacher. It will be erased as soon as the assessment has been completed and will be only be used for the purpose stated.

I have read and understood the above detail and give consent to this teaching session being recorded

Learner Signature:.....

Date:.....

Appendix C: Reflection on teaching video

Reflection on Teaching Video Observation

Through this reflection I will appraise my teaching skills based on the video recording of the session I facilitated entitled "Prescribing Essentials: Insulin" on June 25, 2019 for twenty, fifth year medical students from King's College London. This was a valuable experience and I would like to highlight four main areas to discuss. I think overall, this was a successful teaching session however the video has highlighted some key areas of improvement, together with the feedback I received from the learners and peers. The areas I will discuss are: teaching methods including learner engagement and participation, learner – teacher interaction, teaching resources and equipment.

During my session I used brainstorming ideas, a short didactic tutorial as well as group work based on case scenarios as part of a small group tutorial. Small group tutorials has been shown to be appreciated by students and is effective in acquisition of clinical skills due to retention of knowledge through active participation¹ therefore I feel my choice of small group tutorial was appropriate. I chose to start the session with an ice breaker and brainstorming session which I think was useful as I was able to help the learners relax and create a positive and inviting group atmosphere. Ice breakers also help prepare for the topic and enable focus² which I believe was the case. I know there are negatives about using ice breakers such as intimidation³ however, because I knew the students knew each other well I thought it was be a safe option to start the session. Watching the video, I saw that I spent at least 5 minutes brainstorming session which allowed me to set a baseline for participation and this allowed the students the realize that they will be required to actively participate as opposed to passively listen. I noticed the participation increasing towards the end of the ice breaker. I think the use of flipcharts to structure the initial ice breaker would have been clearer for the learners to follow and I deliberately did not expand on each answer given by the learner I knew that I would be going through this is a structured way via the didactic lecture.

Didactic lecture has been given a lot of criticism as they can encourage passive learning and lead to limited attention span^{3,4}. Having read up on teaching methods I actively ensured that this would not occur. Evidenced in the video, I maintained eye contact and avoided using body language such as facing the screen or reading slides. I tried to involve the audience via questions and relating situations to real life experiences and exam tips which has been shown to increase attention holding in lectures.⁵ My lecture slides also acted as prompts with visual aids as opposed to text heavy content.

The final teaching method I incorporated was a group task based on a case scenario followed by discussion. I chose this method as when altering insulin prescriptions there often is more than one correct answer and as long as the

students followed the basic principles this would be safe. Kolb⁶ describes the experiential learning cycle and I believe that by making mistakes during active prescription charts in a safe environment, they would then reflect on this experience and learn to take different action in the future. Through the video, it is evident that I allowed the students practice new prescribing skills and then facilitated an active discussion, which Ramani and Leinster believe is essential to deep learning⁷.

A believe the above combination of teaching methods allowed me to address the different learning styles of my learners including visual, auditory and kinesthetic learners⁷.

Throughout the variety of teaching methods I was focused on ensuring active participation from all learners and for this to occur I tried to establish good group dynamics early on, based on the Forming, Norming, Storming and Reforming phases described by Tuckman⁸. During the session as well as in the video I noticed that in the beginning I identified one particular student 'dominating' the session and therefore using my role as the group leader I gently encouraged the less vocal or confident members to participate. I used eye contact and turning to face certain groups to encourage participation, examples of non-verbal cues which Walton (describes as a good technique to use in conduct of group discussions⁹.

An example of a learner – teacher encounter which I feel could have gone better was when one learner posed a question to me regarding the time of action of one of the medications. I know I naturally panic when questions are posed as I may feel a threat being challenged in front of a large audience and admit this is something I need to improve. After clarifying the answer, instead of double checking with the learner if he had understood this, I quickly moved onto the next part of the topic. This may had led to confusion and this led to the same learner questioning me again on a similar issue. Walton describes the technique of deflecting questions gently to the audience in a facilitative way for consideration of other participants when questions are directed at the teacher⁹, such as 'that is an important question – what do others think?'. I think this would work well as it would give me a few seconds to collate my thoughts in the sudden panic and also give opportunity for other learners to answer the question.

Lastly I wanted to discuss humor as a method of learner – teacher interaction as I find it interesting and one that I have never discussed before. I noticed in the video that one male learner made a funny but sarcastic remark about the case scenario. When appropriate and in the context of the learning environment, humor can create a positive environment, reducing anxiety and holding students interest¹⁰. I think it was important in building a comfortable teacher – learner relationship and part of one of my roles as a teacher, described by Harden and Jones, is that to be a role model and being personable and friendly is encompassed within that role¹¹. In terms of my other roles of being a facilitator I believe, I was able to do this by paraphrasing the answers that learners gave and relaying them back to the audience with amendments if required, allowing learners to learn from each other which is a technique Gill *et al.* acknowledges as an effective one¹².

In this final section I want to describe an aspect which prior to reading and this video reflection, I did not consider to be an important one. It was only through watching this video that I realized the importance of room layout and the indirect effect it can have on how I interact with the audience. The seminar room I chose was within the medical education center and specifically designed for teaching, it is important to ensure there are no environmental barriers to learning. Gill *et al.* state that getting the physical environment right is very important for learning as it ensure eye contact can be maintained as well as encourage active rather than passive learning¹². I feel the arrangement of the chairs in circles with or without tables would have worked better for the group task and I noticed in my video I was unable to interact with 2 out of the 5 groups during the scenarios due to the difficulty of reaching them. On the other hand, I believe my use of real drug charts from the wards was crucial in developing prescribing skills. Ross and Maxwell state that there is insufficient emphasis on the practical aspect of prescribing in undergraduate teaching¹³ and Gill *et al.* also mentions that allowing time and opportunities to practice new skills in a range of settings with observation and feedback is essential for effective skills acquisition¹². Tutorials involving "near-peer" teaching provides relevant practice for the learners as well as reflection for the teachers¹³. To further enhance prescribing learning, I could have considered inter-professional learning as in real life safe prescribing involves a collaborative effort between pharmacists, nurses and doctors¹³. Perhaps I could include nursing and pharmacy students in my next tutorial.

Prescribing is a common yet complex process involving knowledge, judgment and skills. Preparing medical students to become prescribers is also known to be a huge challenge in undergraduate medicine. I think overall, my teaching

session was successful and I feel that my own objectives were met in terms of the teaching I wanted to deliver. I am at the beginning of my career as a medical educator and I have a lot to learn. I have found the video analysis extremely beneficial as it enabled me to reflect on aspects of my teaching that I am unable to through learner and peer observation. I will continue to use video observation intermittently through my teaching sessions and compare, reflect and develop my teaching skills and role as a medical educator.

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Appendix D: Peer observation forms 1, 2, 3