

WHAT MAKES A GREAT LECTURE? USE OF LECTURES IN A HYBRID PBL CURRICULUM

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Lectures are of great value to students. However, with the introduction of hybrid problem-based learning (PBL) curricula into most medical schools, the emphasis on lectures has decreased. This paper discusses how lectures can be used in a PBL curriculum, what makes a great lecture, and how to deliver a lecture that fits with these changes.

Key Words: curriculum, great lecture, PBL, student learning
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With the introduction of problem-based learning (PBL) into most medical schools, the number of lectures in undergraduate courses has significantly reduced. At one end of the spectrum, a few schools have completely abandoned lectures and introduced instead small-group learning, interactive and student-centered sessions. At the other end, some schools have made minimal changes to their lecturing structure. The majority, however, have introduced integrated lectures to address the needs of a PBL structure [1].

Criticisms against lectures have been raised [2–4] and have highlighted a number of limitations: (i) lectures are usually teacher-centered and do not provide students with opportunities to reflect on their learning; (ii) lectures cannot teach the psychomotor and cognitive skills needed for problem solving, patient management or developing a professional attitude [3]; (iii) most lectures are not interactive and are thus less likely to engage students and foster their critical skills [5]; and (iv) lectures cannot ensure that the students

will value or incorporate the materials learned into their daily practices [6].

Lectures, however, are still of great value to students' learning [7]. They have an important place in the curriculum because they can provide an overall picture or some details, provide an overview of key issues or an argument, reflect on personal experiences or demonstrate evidence and results obtained from research work, or even motivate students and foster their achievements. They do not need to be the main method of instruction, particularly when the aims of the curriculum are: (i) to enhance students' cognitive skills such as generating hypotheses, collecting new information, weighing the evidence for and against a hypothesis, providing reasoning and making decisions; and (ii) to develop non-cognitive skills, including communication skills [8], professional attitudes, interpersonal skills, ethical and moral values, commitment and integrity. Teaching and learning these skills can be facilitated using a number of approaches such as PBL, small-group learning, mentoring, role models, task-based learning, standardized patients, reflection/ portfolios, and 360-degree feedback on performance. However, lectures will retain an important role in teaching, particularly when students are able to participate and actively engage with the material being discussed. For example, it has recently been shown that when a didactic lecture was given immediately



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before a standardized patient (SP) session, more students valued the SP interaction and their performance on the SP check list was enhanced [9]. The authors concluded that using strategically timed lectures can enforce the educational values of other teaching/learning activities such as interaction with an SP.

WHAT ARE THE ROLES OF LECTURES IN A PBL CURRICULUM?

In a PBL curriculum, lectures are not expected to teach concepts from A to Z or provide students with all of the details they need. Lecturers are expected instead to challenge the students' curiosity about key questions and facilitate their understanding of key concepts and principles. Lectures should allow students to explore the significance of new information in relation to what they already know and encourage students to discover applications of the new information. Lectures should not be delivered before the students discuss the first PBL tutorial. The curriculum should be designed in a way that allows students to get the best out of PBL sessions with minimal prior knowledge about the case to be discussed. In the pre-clinical years, the number of lectures may be reduced to five lectures per week; in a total of 16–18 hours of face-to-face teaching plus approximately 10–12 hours of self-directed learning per week. In the clinical years, fewer lectures are usually provided with more emphasis on seminars conducted by students and student-centered small-group learning sessions. However, there are no set rules for the number of lectures in a PBL curriculum and universities may vary these in their curriculum design.

Therefore, lectures in a PBL course should aim to:

- Facilitate critical thinking rather than memorization of factual knowledge. For example, for a 1-hour lecture a lecturer might break the lecture into three segments of 15 minutes each and use the remaining time for structured and critical thinking tasks related to the lecture [10].
- Enable students to research for extra information and use resources after a lecture, rather than providing them with a summary of a book chapter or a monograph. For example, near the end of a lecture on inflammatory bowel disease, a lecturer might show students an outline of a table and ask them what other items they could include in their

comparison between Crohn's disease and ulcerative colitis. They might work on completing the table as part of their self-directed learning after the lecture.

- Encourage students to think laterally and understand the significance of the new knowledge with respect to their prior knowledge, rather than infusing their brains with meaningless pieces of information. For example, using the same example on the inflammatory bowel disease, a lecturer might ask, "Why are patients with ulcerative colitis more likely to present with bloody diarrhea? What are the pathological bases behind the clinical presentations of each of these two diseases?"
- Stimulate deep understanding of concepts rather than superficial recall of information [11]. For example, a lecturer might ask, "How can we explain the pathogenesis of Crohn's disease? What are the main elements that we could include in our mechanism? Why?"

To accommodate these objectives in your lecture, you need to look at the preparation of your lectures from new perspectives and plan them with these concepts in mind [11]. Thinking about delivering high quality content in the lecture is essential, but the approaches you plan to use to present your lecture are more important. How would you engage your students? What diagrams, illustrations, images or mini-videos would you include in your lecture? What are the educational objectives of your lecture? And if you want to introduce one new concept, idea or skill to your students, what would it be?

WHAT MAKES A GREAT LECTURE?

Now back to our original question: what makes a great lecture? A great lecture is not just a good idea and an excellent PowerPoint presentation. A great lecture makes an impact on the audience and is memorable. A great lecture:

- empowers the audience and keeps them focused;
- inspires people and engages them;
- moves the audience and makes them more willing to learn more about the topics discussed;
- provides new insight and stimulates thinking and analysis;
- makes people think and motivates them to develop new skills [12];

- gives the audience a desire to listen to it again and again.

To incorporate these characteristics into your lectures, the 12 keys discussed below may help you to prepare a great lecture.

Key 1: Know the structure of your curriculum

Planning your lecture is vital to its success. But, before starting the process of writing and creating your PowerPoint presentations, consider the following questions:

- What is the structure of the curriculum in your faculty?
- Are you using PBL, case-based learning, traditional teaching or another format?
- What are the teaching/learning means used in the delivery of the curriculum?
- What is the role of lectures in the curriculum?
- What should you do to make your lecture match with the philosophy of the curriculum?
- Whom could you ask?
- What else do you need to know?

Key 2: Know your audience

Who are your students? Some medical courses are designed for graduate students (those with a prior university degree), others are designed for school leavers (those with no prior university degree), or a combination of both. Some schools have introduced interprofessional teaching and encourage integration across disciplines, and the same lecture may be delivered to medical, physiotherapy and/or dentistry students. As a lecturer, you will need to consider the needs of your students and their background in your preparation [13]. Before you start thinking about the knowledge you want to deliver in your lecture, consider the points discussed in Table 1.

Key 3: Begin with the end in mind

Start your preparation by thinking about what key principles you would like your students to learn. In other words, start by defining the learning objectives of your lecture. Defining the learning objectives will help you to focus on what you want to teach [11]. Focus on three to four learning objectives. Give a clear definition for each one and define the cognitive components of each. At this stage, do not worry about details. More importantly, think about the mechanism

Table 1. Questions that enhance planning of your lecture

- Who are my students?
- What do they know about this subject so far? How can I know?
- Who else is teaching them?
- What is the theme of the week?
- What other subjects have they learned and how does this relate to my lecture?
- What are the main points/questions or themes of my lecture?
- If I want my students to leave the lecture theater having learned only one new skill or concept, what should it be?
- What examples can I include in the lecture to encourage learning?
- In what way will my lecture be different from a book chapter or a monograph on the topic?
- Should I use an analogy to explain a difficult concept? What else could I use?
- Should I use a temporal structure? Should I use a logical structure? How can I transfer this structure into my lecture?
- In what way will my lecture add to their learning?
- How does the new information fit with what they already know?
- How does this lecture fit with the overall teaching plan for this group of students?

you would use to translate these objectives into the lecture content.

Key 4: Focus on principles not the fine details

If you want your students to leave the lecture theater having gained only one new skill or concept, what would it be? Think about the mechanisms you would use to ensure that the main principles are well covered and clear to the students. Other important aspects to consider are:

- What are the essential details you will include?
- What further details can the students research?
- How do the examples and applications you give in your lecture explain the main principles embedded in the lecture?

Key 5: Organize the contents of your lecture

By organizing your lecture, you will make it more convincing, captivating and influential. The three main parts you may use to organize your lecture are: the opening (to prepare your students), the body (the main

part of your lecture), and the close (a summary of the main concepts discussed). Most lecturers, however, ignore the first and the third components and focus on the body content, after giving a brief title to the lecture. Use every part of the lecture effectively to facilitate a smooth and logical delivery of your lecture.

Consider the following points:

- keep in mind the time you will spend on each part of your lecture;
- keep a balance between the big picture and the fine details;
- plan the flow of your lecture and check that its flow is logical;
- keep a balance between the theoretical and practical aspects;
- check the links between different components of your lecture;
- you could divide the body of your lecture into two or three sections and give students the opportunity to answer a question or two in these breaks (your questions should target understanding not recall of information) [10];
- allow time at the end of your lecture for questions.

Key 6: Think about strategies to engage your students

Start your lecture with an open-ended question or a problem. Use applications to link your talk with real life practices. Consider questions that enhance students' thinking and engagement. For example:

- What are the consequences of these changes?
- How can we justify these changes?
- What are our hypotheses for this problem?
- What evidence do we have so far?
- What is the relationship between these structures and their function?
- What are the underlying mechanisms for these processes?
- How can we explain these symptoms?
- What else do we need to know at this stage?
- What are the main principles that we have learned so far?
- What are the lessons we could take home?

Difficult concepts need to be well explained. They might not be well explained in textbooks or other student resources. You could consider how your lecture will discuss such concepts. Of course, you are not going to spend a lot of lecture time on this, but you might need a diagram, an illustration,

a three-dimensional model, a mini-video, an analogy or an animation to explain difficult concepts. This will allow the students to visualize the concept, understand its different components, and further develop the model/image to build with related clinical applications. Remember that a picture (a diagram or a three-dimensional model) is worth a thousand words.

Humor is useful in engaging students, particularly when it is used in a timely fashion. Use humor, a cartoon and/or a brief story to highlight a specific issue you would like to leave with your audience and to make your lecture more enjoyable. Imagine a lecturer using these words before starting a story: "Let me tell you a story about one of my patients and what I learned". It is likely that the students in the lecture will suddenly become engaged and give their full attention to the lecturer. Similarly, the students are likely to remember the story for a long time and might share it with others. A good lecturer uses stories as a vehicle to transfer important and useful concepts to his/her students [14].

Key 7: Stimulate critical thinking

The focus of your lecture should not target factual knowledge. Think about educational strategies that you could use to deliver what you want in a way that encourages students' thinking and critical analysis [15]. Think about using action verbs in your lecture and your preparation such as:

- comparing;
- analyzing;
- evaluating;
- hypothesizing;
- looking for evidence;
- linking basic sciences to clinical applications;
- questioning;
- examining possible contributing factors;
- studying pathogenesis;
- explaining;
- identifying gaps;
- measuring/calculating;
- referring to the literature;
- interpreting;
- designing a management plan.

A lecturer who encourages such strategies and uses these words in their lecture are in fact not only giving a stimulating lecture but also enforcing such approaches to be used by their students in self-directed learning [16].

Table 2. Common mistakes that can spoil your lecture

- Using too many PowerPoint or overhead slides
- Providing too much information on each slide
- Showing no visuals, diagrams or images in your presentation
- Providing disorganized information
- Targeting superficial learning
- Delivering the lecture without passion
- Arriving late at the lecture theater
- Providing information that does not fit with what the students already know
- Not designing for the level of the students
- Using many abbreviations
- Using a monotonous or low voice
- Not giving a lot of thought to the lecture
- Not providing examples or applications
- Not giving students the opportunity to ask questions
- Not finishing the lecture on time
- Being distracted from the objectives of the lecture
- Focusing mainly on factual knowledge

Key 8: Avoid mistakes that can spoil your lecture

Be prepared for mistakes that can subdue your lecture. Table 2 summarizes some of the common mistakes. During your preparation and implementation, consider these mistakes and what you need to do to avoid them.

Key 9: Master the art of successful delivery

Delivering a successful lecture is an art that you can master by practice [17]. It is usually the little things that will make a significant difference to your lecture. For example:

- present one idea at a time;
- do not turn your back to the audience to read your PowerPoint slides;
- maintain good eye contact with your audience;
- do not overload your audience with information;
- practice and rehearse your lecture;
- prepare for difficult questions;
- use your voice effectively.

A flat, monotonous voice is boring [18]. Practice will help you to master the vocal elements that are essential for successful delivery of your lecture. These include: voice volume, pitch, rate of delivery, quality, pauses, vocal variety and fluency. Mastering each of these elements and using them effectively will add special dimensions to your lecture. They will enhance engagement, ensure clarity of your presentation and will make your lecture stand out.

- Use pauses to make an impact. Pauses are moments of silence that you can use to highlight important points, to increase the impact on your students and indicate the end of a vital thought unit. Pauses allow your listeners to think and interact with what they have just heard. When well planned, pauses can produce a much higher impact than any words. Do not fill these pauses with commonly used vowels or words such as “um”, “uh”, “well”, “ok”, or “alright”. Try to avoid using them as much as you can [18].
- Master fluency. Fluency is the smooth delivery of your lecture, the flow of your spoken words and the lack of vocalized pauses or hesitations. It is usually the result of good preparation, practice, rehearsal and confidence.

Key 10: Make your lecture stand out

You might think that your lecture will stand out by good preparation, excellent PowerPoint slides, the quality of information delivered and how up-to-date the information included in your lecture is. Although all of these factors are important, they do not, on their own, make your lecture stand out.

The art of giving an excellent lecture is not about competence in the area of your expertise but rather about the teaching strategies and skills you have developed and mastered, and how you use your lecture to empower your students, energize them, change the way they think and help them to develop their own skills [19].

Your lecture will stand out:

- not by impressing students with your knowledge but rather by teaching them how to apply this knowledge in practical situations;
- not by answering every question they might have for you but rather by teaching them how to find the answers themselves;
- not by teaching them a discipline but rather showing them how this discipline relates to knowledge from other disciplines;
- not by teaching what you want them to know but rather addressing their learning needs.

Key 11: Encourage students to ask questions

Show interest in your students and encourage them to ask questions [20]. Most successful lecturers allocate the last 7–10 minutes of their lecture for questions.

Why is it important to encourage students to ask questions?

- To check their understanding of the concepts discussed.
- To correct misconceptions and explain areas that were not clear to them.
- To encourage them to develop their critical skills and lateral thinking.
- To provide them with more information or resources for areas that you have touched on but not to the depth they want to know.
- To know more about your students and build bridges with them.

Many students might not be ready to ask you questions during the lecture, but instead may email you with questions later. Provide students with your email address if it is not already known to them.

Key 12: Encourage feedback on your lecture

Encouraging students to give feedback on your teaching will help you achieve your goals [21]. First, feedback will help you to see what you have not seen in your teaching. Second, feedback will allow you to discover how your students perceived your lecture and what was useful to them. Third, feedback will break down barriers between you and your students. Finally, it will empower you to introduce new strategies into your teaching.

Another way of getting feedback on your lecture is to have a friend or colleague in medical teaching act as an observer and, using a performance protocol, evaluate your performance in the class [22]. Self-reflection is another approach. Reflective journals and portfolios are very useful in recording your reflections, the challenges you faced during a lecture, identify areas where you need to improve your skills, and any feedback that you could use in making your next lecture better.

CONCLUSIONS

The introduction of PBL in most medical schools has caused significant changes in the use of lectures in teaching undergraduate students. Lectures in the new pedagogy should not focus on factual knowledge and memorization. A lecture in a PBL course should focus on critical thinking, integration of knowledge, reasoning, and strategies to enable and encourage the

students to research extra information themselves. Lectures should also stimulate deep understanding of the concepts, and encourage students to think laterally and understand the practical applications of the new knowledge. The 12 key concepts discussed in this paper will help new and experienced lecturers to improve their lecturing skills.

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