As educators, we are continually designing new methods and procedures to enhance learning. During this process, good ideas are frequently generated and tested, but the extent of such activities may not be adequate for a full manuscript. Nonetheless, the ideas may be quite beneficial in improving the teaching and learning of physiology. *Illuminations* is a column designed to facilitate the sharing of these ideas (illuminations). The format of the submissions is quite simple: a succinct description of about one or two double-spaced pages (less title and authorship) of something you have used for the classroom, teaching, laboratory, conference room, etc. You may include one or two simple figures or references. Submit ideas for inclusion in *Illuminations* directly to the Associate Editor in charge, Stephen DiCarlo (sdicarlo@med.wayne.edu).

**The Active Review: One Final Task to End the Lecture**

The fundamental goal of any educator is to promote activities that will engage students in their learning (2, 4). The importance of promoting an active learning environment is a long-standing concept and was readily accepted by Tyler (5) in the late 1940s, who stated that “learning takes place through the active behaviour of the student: it is what he does that he learns, not what the teacher does.” On this matter, Nayak (3) recently discussed how the traditional 1-h lecture can be broken into three 15-min periods of teacher-related activity, whereas the remaining 15-min period can be used for student-centered activities. In my own teaching domain of exercise physiology, I am constantly striving for the latest innovative, meaningful, and relevant task to incorporate into the classroom or lecture theater. However, as I reflect on my teaching practices with the aid of video analysis, student feedback, and peer review, one task seems to stand head and shoulders above the rest. This task is not introduced during the session but is presented at the end of every lecture and is simply known as the “active review” (1).

In beginning the active review with unfamiliar groups, I typically commence with a light-hearted comment, stating that “I used to summarize the lecture myself, but it is now time for the students to do some work for a change!” Each student is then instructed to spend 10–15 min working in small groups (depending on class size) and asked to make notes of the key points of the session and in the correct chronological order. Although the students reflect on the lecture content in a shared capacity, they are asked to make individual notes for consolidation and are aware that each individual is expected to formally participate in the feedback component of the review. During this time, I work my way around the room to monitor engagement levels carefully and to answer any questions where needed. I will often spend 1–2 min listening to the group discussions and may intervene (if needed) to ensure that everyone is involved or to correct any misconceptions that may have arisen. Upon completion of the designated time period (it is not uncommon for students to request more time, a statement in itself perhaps), the students are then asked to feedback their summary to the class. The “student feedback” component of the review normally averages between 10 and 20 min in duration, during which time I work my way back and forth from each group employing a simple question and answer style.

The questions posed are designed to assess the major learning outcomes of the session and may focus on the understanding of basic terms, calculations, potential applications, etc. A member of each group will provide the answer (often one word is all that is needed), and the attention is quickly switched to the next group. For example, if aspects of an exercise biochemistry session are reviewed, I may comment “OK, let’s now think about the adenylate kinase reaction—which consists of ADP plus what?” In this instance, the student would respond with “ADP,” to which I progress by directing “equals what?” to the next student. This student will hopefully reply with “ATP and AMP,” to which the discussion then progresses to the deamination of AMP and so forth. In switching to and from groups, I am also extremely conscious of making sure that everyone is actively involved in the feedback and that I do not rely on certain individuals. In fact, it is striking to see how students feel much more comfortable and secure to engage in this closer-knit environment as opposed to when questions are directed to the whole cohort during the lecture component of the session.

I have used this approach in both the large-tiered lecture theater (student numbers of >120) and the small class room (student numbers <50) and have never failed to be amazed by the student response. While the method is particularly effective when working with relatively small class sizes where I can easily ensure everyone provides (or attempts to provide) a response by methodically asking different individuals, it is acknowledged that it is somewhat more difficult to ensure that everyone participates when in the large lecture. Nevertheless, I have routinely obtained anonymous student feedback (from both small and large group settings) via open-ended questionnaires, and the majority of responses suggests that this component of the lecture is a highly productive, enjoyable, and relaxed method of teaching (see Table 1). In fact, from the 219 questionnaires distributed, 91% of students responded with positive comments (7% of students did not answer this partic-

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<th>Table 1. Examples of student feedback to a question contained in an open-ended questionnaire entitled “Did the lecturer summarize the lecture content in a clear and concise manner?”</th>
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<td>Yes–great summary with class included. I have never seen someone work everyone in the lecture before! The class did this with his assistance–excellent teaching approach. He asked around the lecture theatre to provide our own summary. Clear and concise and the best summary yet. Yes, good interaction throughout. We went through it ourselves at the end and it was clear and concise, it definitely kept me interested. No, we did it! Yes, he involved the whole class and it definitely made me think more than usual! Yes, very much so!</td>
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ular question and 2% responded with negative comments, stating that they often felt “pressurized” when asked questions in class regardless of whatever format the questions were presented). When being peer reviewed, observers also frequently remark on this aspect of teaching with extremely positive comments, and I have later learned that they have also incorporated this approach into their own practice. In addition to promoting an active learning environment, the active review also provides an excellent avenue for which to obtain formative assessment of student learning and, as such, can act as a catalyst to promote and guide personal reflections of one’s practice.

In summary, it is my experience that the active review not only provides one final student task with which to end the lecture but also is most effective in terms of promoting engagement. Nevertheless, one must be aware of the aerobic capacity that is required to perform several circuits of a large-tiered lecture theater!

REFERENCES


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