Teaching Tips/Notes

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Two Answers and a ?

Introduction

In veterinary medical curricula, didactic teaching by classroom lecturing is common. Engaging students by providing active learning opportunities is desired to enhance knowledge acquisition (Hattie, 1992). Interactive activities including presenting questions during didactic sessions provides an active learning opportunity, but it has been demonstrated that only a few students may respond while others maintain a passive role, choosing not to participate (Buck, 1997). Classroom response systems (polling systems), provide opportunities for the entire class to participate (DeBourgh, 2008). This technology is commonly employed to capture and maintain student attention and to help facilitate active learning. These systems provide two-way feedback where students may ask to clarify complicated material, and the instructor obtains real-time assessment of student comprehension. Classroom response systems are examples of a teacher-directed learning modality where the instructor designs questions and discussion topics to guide students during class. Unfortunately, students may become complacent with the use of polling systems, and some will become disengaged even though the questions are directed at the entire student body (Beatty, 2004). Also, utilization of polling systems adds one more level of complexity to the classroom, because accessing a technology-based polling system requires additional time prior to lecture. The teaching innovation, *2 answers and a ?,* was developed for use at the beginning of didactic lecture sessions to encourage active student learning. This is a non-technology based student directed teaching method designed to assess the level of student comprehension and provide an opportunity for students to express or clarify course material.

Procedure

At the beginning of lecture, an individual is selected at random by drawing a name from a bag. For effect in a veterinary classroom, an unsoiled dog poop bag is used. The selected student is required to describe two fundamental items learned during the previous session and to present an insightful, higher cognitive level question related to course material. This innovation requires that all students review previously presented material, critically assess the material, and prepare higher order questions without prompting by the instructor, encouraging student-directed learning.

Assessment

During the fall term of 2015, 24 veterinary clinical pathology lectures were video recorded, each 50 minutes in length, for second year veterinary students (32 students) in the Washington, Idaho, Montana, Utah regional veterinary program at the Logan, Utah campus. The lectures were reviewed, and the number of unsolicited student questions requiring material synthesis, application, and critical thinking after the initial required question from the selected student were counted. In addition, the iclicker polling system (Macmillan, London) was sporadically utilized at the beginning of or during lecture sessions. The number of questions

from the instructor for these iclicker sessions were tabulated and averaged as well as the number of unsolicited student questions asked during each session. The time that elapsed from the beginning of either the *2 answers and a ?* session or the iclicker session to completion of the discussion was evaluated (Table 1). Of 24 recorded lectures, 85 additional questions were asked by students when the *2 answers and a ?* method was employed. An average of 3.5 unsolicited higher-level cognitive questions were asked during each lecture. Few additional questions were asked when the iclicker was used.

Table 1.

	*2 answers and a ?	[1]iclicker at start of lecture	[2]iclicker during lecture
Average additional questions asked	3.5 (Range 0-9)	2 (Range 1-3)	0.4 (Range 0-2)
Average iclicker questions asked		3 (Range 2-4)	2.4 (Range 2-3)
Average Time Elapsed	4 min 55 sec (Range 55 sec-10 min 45 sec)	6 min 56 sec (Range 4 min 20 sec-8 min 46 sec)	5 min 44 sec [3](Range 2 min 48 sec-11 min 56 sec)

*24 lectures total
[1]iClicker questions at the start of lecture used 3 times
[2]iClicker questions during lectures used 7 times
[3]The time variation is the result of question complexity

Numerous technological advances are available to educators which has not come without cost. There may be decreased quality instructor-student interaction before and after didactic lecture sessions while the instructor is preparing or shutting down programs and instrumentation. The *2 answers and a ?*, non-technology based teaching method encourages unsolicited higher-level cognitive student questions contributed during each session. In addition, when compared to iclicker polling sessions, less lecture time was spent per session implementing the innovation. Critical thinking is central to the education of future veterinary practitioners, and polling systems emphasizing instructor-directed learning do not always allow students to explain what they felt was emphasized or how the information was interpreted. Providing student-directed learning methods allows the instructor an opportunity to determine if there are gaps in what material was emphasized and what the students comprehended.

Literature Cited

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