Use of the Iclicker classroom response technology in 1st year Medical Physiology

Kenneth J. Longmuir
Associate Professor
Acting Course Director for year 2006-2007
School of Medicine, University of California, Irvine

Summary: Iclicker remote classroom response units were issued to 105 1st year medical students and 7 graduate students for use in the 1st year Medical Physiology course administered by the Department of Physiology & Biophysics. Six of the fourteen faculty who teach in the course incorporated the Iclicker into their lectures in a substantial manner. For these faculty, two additional questions specific to the use of the technology were placed on their teaching evaluation form. There was a strong correlation between the students' evaluation of the Iclicker technology and the students' evaluation of the overall teaching quality of the faculty member. Narrative comments from individual students regarding the Iclicker by-and-large addressed two subjects: 1) Whether or not the faculty member integrated the technology into his lectures in an effective manner. 2) How and when the faculty member provided the answers to the Iclicker questions. The major difficulty encountered with the incorporation of the technology into the medical school teaching program was the lack of administrative and instructional support from Educational Affairs. Recommendations regarding further use of the Iclicker in the medical school are listed at the end of this report.

In August, 2006, the Chairman of the Department of Physiology & Biophysics requested that the acting course director of the Medical Physiology course incorporate the Iclicker classroom response system (www.iclicker.com) into the course. After a series of discussions, three groups provided the funding to purchase 125 Iclicker response units and four base stations: 1) Educational Affairs, under the leadership of Dr. Manetta, provided $2500. 2) Diane O'Dowd, Professor of Developmental and Cell Biology, provided $1000 as the Principal Investigator of a grant from the Howard Hughes Medical Institute. 3) The Department of Physiology & Biophysics provided the remaining cost of $969.75. The support of both Dr. Manetta and Dr. O'Dowd is very gratefully acknowledged. The technology would not have been implemented without their participation.

The Iclicker remote units were issued to all 105 1st year medical students free-of-charge, with the presumption that the student will retain his/her unit for use throughout all four years of medical school. If lost, a student is expected to replace the lost unit by purchasing a new one at the UCI Bookstore. The Department of Physiology & Biophysics issued units to the seven graduate
students taking the Medical Physiology course. These units were returned the Department at the end of the course in March, 2007.

Six of the fourteen faculty who teach in the Medical Physiology course made the effort to incorporate the Iclicker into their lectures and, in some cases, their review sessions. Two other faculty experimented with the technology in a one-time-only manner. The experiences of these two faculty are not discussed here. Faculty used the technology for anonymous student responses only. The technology was not used by any faculty member for attendance-taking, nor for testing purposes. Despite the fact that 112 remote units were issued for the course, no more than 50 responses were received at any one time.

All faculty who teach in the course are evaluated by students. Currently, the Department uses a teaching evaluation form with eight questions. Students are asked to rate each faculty member on a 1 (lowest) to 7 (highest) scale. For the six faculty who made extensive use of the technology, two additional questions were added to their teaching evaluation form. These questions also requested a student response using the 1 to 7 scale format. A copy of the form is seen on the next page.
You are: Medical Student/Graduate Student

DEPARTMENT OF PHYSIOLOGY AND BIOPHYSICS

FACULTY TEACHING EVALUATION
Introduction to Medical Physiology 206A
Fall 2006, Course 11565

INSTRUCTOR’S NAME:

The following items reflect several characteristics of good teaching. Please indicate the degree to which you feel the items are descriptive of the instructor.

Rating Scale: 7 – Excellent, 5 - Above Average, 4 – Average, 3 - Below Average, 1 - Poor

The Instructor: Rating:

1. Explains the topic clearly

2. Covers the topics in a thorough manner

3. Is well prepared

4. Knows whether or not the class understands the topic

5. Organizes and summarizes the major points

6. Has interest in and concern for the quality of his/her teaching

7. Assists the student in understanding material beyond lecturing

8. Give your overall rating of the instructor in comparison to other teachers in general that you have had

Rating Scale: 7 – very helpful, 3 – no difference, 1 – not helpful

The “IClicker”

9. The use of the use of the “IClicker” technology was helpful in assisting my understanding of the material

Rating Scale: 7 – very interesting, 3 – no difference, 1 – less interesting

10. I found the lectures where the “IClicker” technology was used were more interesting

Additional Comments:
It is clear comparing the numerical results of the Iclicker questions (questions 9 and 10 on the faculty teaching evaluation form) with the other (non-Iclicker) faculty evaluation questions (questions 1 through 8) that there is a strong correlation. Below are the scores for individual faculty who used the Iclicker.

<table>
<thead>
<tr>
<th>Faculty member</th>
<th>Evaluation score other than Iclicker</th>
<th>IClicker evaluation score</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>4.68</td>
<td>5.04</td>
</tr>
<tr>
<td>#2</td>
<td>4.88</td>
<td>5.23</td>
</tr>
<tr>
<td>#3</td>
<td>5.39</td>
<td>5.38</td>
</tr>
<tr>
<td>#4</td>
<td>5.42</td>
<td>5.38</td>
</tr>
<tr>
<td>#5</td>
<td>5.62</td>
<td>5.54</td>
</tr>
<tr>
<td>#6</td>
<td>6.42</td>
<td>5.77</td>
</tr>
</tbody>
</table>

The correlation of the Iclicker score with the "non-Iclicker" score is shown in the graph below. The correlation coefficient is 0.982.
Below and on the next page are the narrative comments by individual students regarding the use of the iClicker. The comments are from the teaching evaluations of the five faculty who used the technology most extensively in their lectures. (The sixth faculty member who used the iClicker did not have any iClicker-related comments on his teaching evaluation.) The order of the comments has been randomized and references to individual faculty have been disguised or deleted.

I love the clicker questions. The class can get a sense of where they stand in terms of understanding.

Often clicker questions were too easy and gave a false impression that I understood the material.

I really liked the clicker questions - especially b/c Dr. XX provides the answers, so I was able to study very effectively.

Great section - however maybe clicker question answers could be provided next time.

I especially liked how he used to iClickers to determine the format for the review session.

I loved the I-Clicker technology. I think it's a great alternative to interacting w/ other students. This way we can get a feel for how the class as a whole is doing w/o taking too much lecture time to do it. I find it very useful for larger classrooms.

Great jokes & humor through the I-clicker. Material was very clear.

Fantastic lecturer - well organized and well paced, and clicker questions were interesting and helped in learning the material that I didn't know I had problems with.

Overall, good lectures. I found myself lost during explanations at times, but the I-Clicker questions were helpful to reinforce those concepts.

Thanks for providing us with that powerpoint of the clicker Q's - we really appreciated it!

Great but could help if posted iClicker answers at some point.

His Iclicker strategies better than other's. 1 question - 1 correct answer - a good model
You used the Iclicker ?s to integrate the information in your lecture, which is important.

I liked the Iclicker questions - perhaps the answers to the clicker ?’s can be posted a few days before the exam.

Iclicker can take a long time…make an Iclicker question with 1 correct answer (or all of the above, or 1 is incorrect)

Definitely keep clickers, questions were about the "interest level" so I give them 5s but in terms of understanding, VERY HELPFUL.

Clicker questions should have the answers on them to study later along w/ questions posed in core notes. Lecture was too fast w/ too much information crammed in.

Iclicker reviews were the best reviews I've had. Thank you!

The iClicker idea is good - helps instructor understand class’ comprehension & is interesting because it's interactive.

I clicker Q's are great!

Clicker in moderation is good, however to many P's coupled w/ class immediately can make the process a distraction.

The Iclicker was distracting & kept Dr. XX from teaching. It broke up the flow of the lectures in a way that seriously disrupted learning. If iclicker display had a home in slide (space left for it) & you just opened (leave a single ? On entire time) display window for questions), it might have been less disruptive.

If you have made iclicker Q's, use them - sometimes Dr. XX skipped over Q's in the interest of time. Also, don't show the result when only 50% of the votes are cast; the rest of us slower people just end up accepting the majority w/out thinking about it.

I thought the iClicker review sessions were especially helpful in telling me what I did and didn't know and therefore telling me what to study.

Used iclicker to express main points - great use

Actually I clicker was rather distracting in terms of being focused on lecture. Suggestion: put answers to I-clicker Q's on powerpoint presentations. Material was confusing in presentation, but instructor did his best to explain.
The major difficulty encountered with the use of the Iclicker was the lack of administrative and instructional support from Educational Affairs. Despite the fact that Educational Affairs provided more funding for the technology than any other group, the administrative staff of Educational Affairs was not able to help with the coordination of the funding and the purchase of the units. In addition, the purchasing procedures of Educational Affairs, as a unit of the Office of the Dean, are slow and unresponsive. Even if Educational Affairs had coordinated the funding and purchasing, the units would not have arrived in time for use in the fall quarter. Coordination of the funding sources and purchase of the Iclicker units were administered instead by the Department of Physiology & Biophysics. The assistance of Sue Stach, Cathy Ledray, and Sarah McCarthy in the Department office is gratefully acknowledged. Using the more efficient purchasing system of the Department, the units were received within two weeks of placing the order.

Other issues regarding the lack of instructional support were as follows:

1. The audiovisual (AV) staff was not trained regarding the use of the technology. This led to an unfortunate episode where a faculty member, not fully prepared to use the technology, had the system fail during the course of the lecture. He then expected the AV staff member to rescue him, who could not do so. Without training of the AV staff member, more of these episodes will occur.

2. Educational Affairs indicated they would make the effort to implement the Iclicker in their Patient/Doctor 1 course, so that Medical Physiology would not be the only course using the system. To my knowledge, no use of the Iclicker was made in that course.

3. Educational Affairs indicated they would perform the outreach needed to introduce the other departments in the medical school to the availability and use of the technology. Through March, 2007, no outreach efforts were made. Based upon conversations with individual faculty, there is virtually no knowledge in the other departments that the Iclicker is being used and is available for use within the medical school teaching programs. It is my understanding that some outreach has been provided by Dr. O'Dowd to the Department of Anatomy and Neurobiology.

4. Educational Affairs was to provide electronic spreadsheets and/or templates, associating student name and ID number with the Iclicker identification code. This, along with written instruction sheets, would allow interested faculty to incorporate attendance-taking and testing into the Iclicker system. No work was carried out by Educational Affairs in this area.
Recommendations:

1. For the Department of Physiology & Biophysics, it appears the initial use of the technology has been positive. However, based upon student comments, there is clearly room for substantial improvement. Faculty attention-to-detail and refinement of the use of the technology is necessary. We should continue to use the Iclicker for another 2 years, and make the effort to improve its incorporation into the course, before making a serious decision about its value in Medical Physiology.

2. From here on, funding and purchasing of the Iclicker remote units, and their distribution to the first year medical students, is the responsibility of Educational Affairs, not the Department of Physiology & Biophysics.

3. If other departments are interested in incorporating the technology into their courses, they should "buy in" by purchasing their own base stations.

4. Faculty on the undergraduate campus enjoy a high level of instructional support, as a matter of routine, from Media Services and NACS. This includes the use of the Iclicker. Educational Affairs should engage in extensive discussions with these groups to arrange for a similar high level of instructional support for the faculty of the medical school. In addition, Educational Affairs must perform the outreach necessary to fully inform departments and individual faculty that these instructional support services are available. Otherwise they will go unused.

5. Clearly, Educational Affairs should carry out a full review of its instructional support services. Then it should decide upon the instructional support services it will, and will not, provide. Furthermore, Educational Affairs must put in place effective management systems and procedures to insure that these instructional support services are provided at a high level of quality on an ongoing, year-after-year, basis.