Increasing Student Engagement and Learning with Clickers

By Spencer Benson
Director of CTE

Faculty looking to improve their large classes now have another option. In what follows, CTE Director Spencer Benson outlines a new program on campus to support the use of classroom response systems, or “clickers.” This technology facilitates active learning and adaptive teaching strategies.

Clickers, which resemble miniature remote controls, transmit student responses to a central device which in turn records those responses and displays findings, often in graphs that indicate how many students selected each possible answer. Because teachers are immediately aware of whether or not students understand a concept, they are able to devote their attention accordingly. Vastly more effective than asking for a show of hands (e.g., “Does everyone understand?”), clickers create a venue for each student to demonstrate comprehension on the spot.

In addition, this technology enables students to be actively engaged in their own learning. When coupled with peer-to-peer...
If you are a graduate teaching assistant (GTA) with a teaching-related concern, issue, or crisis, and you want the advice of a seasoned and trained GTA, call on one of CTE’s Help on Teaching Fellows. The HoT Program fellows are prepared to work with you on:

- Assessment
- Course design
- Teaching methods
- Discussion strategies
- Student evaluation data
- Classroom management
- Motivation strategies

As a UMD GTA you can have up to three one-hour consultation sessions with a fellow each semester. These sessions are informal, voluntary, and confidential and are intended to address your teaching issues. If you seek an ongoing mentoring relationship, you should contact your department’s graduate director and inquire about opportunities for mentoring within your department.

To arrange to meet with a HoT Program Fellow, contact Peggy Stuart, CTE’s Coordinator of Graduate Student Programs, at (301) 314-1283. Peggy will put you in contact with the fellow who can best address your needs.

CTE has made available—on its website—valuable teaching resources for the campus community. Visit http://cte.umd.edu/PODresources.htm to review a number of teaching resource packets published by the POD (Professional and Organizational Development) Network.

POD packets address current, relevant topics in higher education teaching and learning. Each is composed of past “Essays on Teaching Excellence,” a POD Network publication series that begun in 1989.

Written by expert scholar-practitioners, these thoughtful and succinct essays can be used as readings for faculty development workshops, seminars, individual consultations, and classes on college teaching.

EXAMPLES OF AVAILABLE PACKETS:
- The Learning Process
- Change, Renewal, and the Professoriate
- Thoughts on the future
- Technology and Related Issues
- Improvement of Teaching and Assessment
- Alternatives to Traditional Teaching Methods and Learning Strategies
- The Student/Teacher Relationship
- Defining and Characterizing Teaching
- Motivating Students
- Cooperative/Collaborative Learning, Small Groups
- Critical Thinking
- Diversity Issues
- Grading, Testing and Assessment
- Introductory Courses/General Education
Recent Teaching & Learning Events on Campus

Professor William J. “Bill” Higgins, a familiar face among advocates of good undergraduate teaching at the University of Maryland, and certainly one of the most highly regarded teachers on campus, was honored with the Kirwan Undergraduate Education Award during this year’s Fall Convocation. According to the University’s description, “The Kirwan Undergraduate Education Award recognizes faculty or staff who have made exceptional contributions to the quality of undergraduate education at the University.”

Higgins has been a faculty member in the Department of Biology for more than 30 years and, among other administrative roles, was Associate Dean for the College of Chemical and Life Sciences (then the College of Life Sciences) from 1989 to 2001, and Director of Undergraduate Studies, Department of Zoology between 1982-1985 and 1988-1989.

CTE has asked Higgins to address new Graduate Teaching Assistants during its most recent Orientations, and his refreshingly straightforward and demystifying insights always provide the program some of its best moments. We congratulate Professor Higgins for this distinction.

On October 5, 2005, CTE hosted a reception for 15 German academics, all participants in the Maryland English Institute’s *English for Teaching Purposes*, a two-week professional development seminar for university faculty now required to teach some of their courses in English. Spencer Benson opened the seminar with a presentation on “Best Practices in Higher Education.” The participants represented six different universities from all parts of Germany, from Hamburg to Constance, Leipzig, Ulm, Hohenheim (outside Stuttgart) and Tuebingen, with whom UM has had a long-standing partnership. The program was partially funded by the German Academic Exchange Service. The participants’ fields range from electrical engineering, math, physics, agricultural economics, business administration, business education, Japanese studies, gender studies, politics and government of the EU and peace and conflict resolution.

In addition to four hours per day of intensive instruction in classroom English, the course agenda included observation of a UM ‘faculty partner,’ with whom participants met to discuss teaching methodology and matters of mutual interest. Along with CTE, OIT’s Deborah Mateik was closely involved in course preparations and the WebCT space reserved for the course. Both Deborah Mateik’s and Spencer Benson’s presentations are linked to the WebCT space for participants’ reference once they return to their home universities in Germany. Participants were seen out and about campus visiting UM libraries, having their picture taken rubbing Testudo’s nose and lunching at Stamp.

Any UM faculty member interested in becoming a ‘UM faculty partner’ next year should contact Linda Sahin, lsahin@deans.umd.edu at MEI.

-Marian Graham
...for your review: Calls, Conferences, & Grants

2005 Graduate Teaching Assistant Development Grants

CTE is accepting proposals for Graduate Teaching Assistant Development Grants. For the last seven years, GTA Development Grants have helped departments and colleges that seek to improve their development, support, and recognition of graduate teaching assistants. The purpose of these grants is to improve graduate teaching assistant professional development and thereby enhance undergraduate student learning. Graduate Teaching Assistant Grants are made possible by the Center for Teaching Excellence, the Graduate School, and the Office of the Provost.

To apply for a grant, visit http://www.cte.umd.edu/grants/tagrants/tagrants.html. All application materials are to be submitted electronically via the CTE website. The application deadline is December 1, 2005. Grant recipients will be notified in early January 2006.

For more information, please view the CTE website or contact Margaret Jerome Stuart, Coordinator of GTA Programs, by phone (301 314-1283) or by email (mjstuart@umd.edu).

Colloquium on the Scholarship of Teaching and Learning: Evidence, Impact & Momentum

Madison, WI
April 1-2

Co-sponsored by The Carnegie Foundation for the Advancement of Teaching, the University of Wisconsin Office of Professional and Instructional Development (OPID), and the UWS Leadership Site for the Scholarship of Teaching and Learning.

Proposal submission for the 2006 Scholarship of Teaching and Learning Colloquium deadline is December 1, 2005. Submissions can be panels, roundtables, or posters.

For more information, see http://www3.uwm.edu/dept/leadershipsite/proposal06.cfm

Lilly-East Conference on College and University Teaching

University of Delaware
April 6-8

Learning So Everyone Teaches

The Lilly Conferences serve as the premier forums in the country for demonstrating, modeling, and discussing innovative teaching practice at the university level. Internationally-known scholars join junior and senior faculty colleagues to discuss pertinent topics such as incorporating technology into teaching, encouraging critical thinking, using student portfolios as an assessment tool, implementing collaborative learning, and evaluating teaching effectiveness.

Cosponsored by Towson University

Call for Proposals Deadline: January 16, 2006. For more information, see http://www.udel.edu/lillyeast/.
The Carnegie Foundation for the Advancement of Teaching and the Council for Advancement and Support of Education (CASE) has named engineering professor James Wallace the 2005 Maryland Professor of the Year.

According to CASE, the Professor of the Year award identifies outstanding undergraduate instructors that excel as teachers and influence the lives of their students. It recognizes the impact and involvement of university faculty and the contributions teachers can provide to the institution, the community, and the profession.

Wallace, a professor of mechanical engineering in the university’s A. James Clark School of Engineering, is the third University of Maryland professor to be named Maryland professor of the Year since CASE began selecting state award winners in 1986. Previous winners from the university were Spencer Benson, associate professor of microbiology (2002) and Maynard Mack Jr., professor of English (1992).

A member of the University of Maryland faculty for 30 years, Wallace was honored for his outstanding undergraduate teaching in mechanical engineering and for leading the university’s development of undergraduate initiatives dealing with the intersection of science, technology and society.

In the late 1970s and early 1980s, Wallace brought together University of Maryland faculty in history, philosophy and the social sciences with faculty from engineering and the physical, computer and life sciences to develop science, technology and society (STS) curricula. This effort ultimately resulted in an STS undergraduate certificate program and provided the groundwork for two others, the College Park Scholars STS program and the Gemstone Program.

Wallace’s commitment to students and the quality of their education also is evident in his participation on a university committee whose 1988 report, “Promises to Keep,” formed the basis for the university’s Core Liberal Arts and Sciences Study Program (CORE) that has been required of every University of Maryland undergraduate for the past 15 years.

Wallace, who was named a Distinguished Scholar-Teacher by the university in 1987, notes that in teaching engineering courses such as fluid mechanics, he seeks to both inspire and require his students to “understand the fundamental ideas, and the language and mathematical expression of those ideas, so that this knowledge will stay with them forever.”

Graduate student Carlos Cruz, praised Wallace by saying, “His teaching is not solely focused on assimilation of knowledge, but more importantly on the ability to formulate a research problem, devise a strategy to solve it and analyze the results.”

Professor Wallace also currently serves as the director of the university’s Gemstone program. Gemstone, a unique multidisciplinary four-year research program for selected undergraduate honors students of all majors, allows students to design, direct and conduct significant research while exploring the interdependence of science, technology and society. Ryan Hoffmester, chair of the Gemstone Student Council, cites Wallace as “a driving force in persuading me to get involved in the program outside the classroom.”

CASE established the Professors of the Year program in 1981, later incorporating the Carnegie Foundation and TIAA-CREF, one of America’s leading education financial services, as sponsors. This year’s winners represent 40 states, Guam and the District of Columbia. Candidates are nominated by peers from their institution and endorsed with recommendations from former students, colleagues, and academia leaders.

On November 17, Wallace was honored with the other winners at an awards luncheon at the Hyatt Regency in Washington, D.C. and an evening reception at the Library of Congress with members of Congress attending.

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Contact: Lee Tune, 301 405 4679 or ltune@umd.edu
This is the fourth in a series of interviews with exemplary graduate student teachers at the University of Maryland. We hope to publicize and celebrate the significant contributions to undergraduate education made by our graduate students.

Beth Osborne, a Graduate Student in the Department of Theatre, is completing requirements for CTE’s UTLP. Her experience teaching in different capacities is especially broad.

TLN: Tell us a little about your teaching experience. What sort of classes have you taught? In what capacities (e.g., traditional teaching assistantship, autonomous teaching) have you worked?

BO: I have taught a number of different types of courses, though many of them have not been at the University of Maryland. While working on my MFA at Brandeis University, as an Instructor for Student Support Services, I worked with students from historically underrepresented groups. I created and taught group courses on GRE preparation, and tutored students on the GRE, MCAT, LSAT, and GMAT. Also at Brandeis: Instructor for the McNair Scholars Program. I taught both writing and GRE prep courses to a group of undergraduate scholars chosen to work on independent research over the summer. Teaching Assistant for Theatre History. This was a traditional teaching assistant position, in which I graded, assisted with discussion, wrote exam questions, ran review sessions, and provided other general assistance. Teaching Assistant/Writing Instructor for the Advanced Freshman Writing Seminar Program. This was a team-teaching opportunity that paired me with an established scholar and professor. The course was divided into two sections – literature and writing. My primary responsibility was in teaching the writing portion, but I also worked with the professor on exams, paper topics, discussion ideas, and overall course content. My first two years at the University of Maryland I was on a University Fellowship and did very little teaching. When I was given a teaching assignment as a partial assistantship, pregnancy complications interfered and I was forced to take medical leave from the university. So, beyond that time of “partial teaching,” I really only began working in the classroom in the Fall, 2004 semester. Last year I was one of six Teaching Assistants for THET110 – Introduction to Theatre. My job consisted of teaching 3 discussion sections and attending two lectures and one meeting each week. In THET110, the TAs do all of the grading and have the majority of the student interaction, so we get to know the students quite well. We guide them through exams, papers, assignments and performance projects. This year I am the Head Teaching Assistant for THET110, which adds mediator, facilitator, and mentor to my regular duties. This summer I will be teaching Introduction to Theatre on my own.

I have also taught for the Institute of Reading Development and Interact Story/Creative Kids. Interact Story, in particular, is a great organization that uses theatre to both inspire young children’s joy in reading and to help them find their individual talents.

TLN: Graduate teaching assistants and instructors may occasionally have difficulty being both teachers and students simultaneously. Have you found or developed any effective strategies for connecting your own scholarship as a graduate student with your work in the classroom?

BO: This is a difficulty that many graduate students/teaching assistants face, and it is compounded for many theatre scholars because of the additional division we experience with production work. While nothing that I have found is failsafe, a few methods have helped me in my time here. I try to remember that teaching is also a learning experience and that it’s alright to try something new in the classroom – even if it completely bombs. I’ve often found that teaching introductory courses like...
this are quite helpful in preparing for comprehensive exams, as well as for reminding me of the typical non-specialist reader; as long as I remember the value in reviewing material and being able to simplify that material to its essence, I find that teaching is complementary to scholarship. I also try to return to the practical end of things every so often. In theatre this is easy since productions regularly need experienced people with some expertise to help out. For me, finding a show that involves either my research or an interesting tangent is a great way to seek out new approaches to problems I may be having in my own work. Finally, I find that using the network of other graduate students and faculty members in the department can be incredibly helpful. Everyone has different strengths and there’s nothing wrong with bringing in a guest lecturer to speak on a topic they are passionate about. This is also a great way to show other people in the department that you would be willing to do the same for them on your topic, which not only builds a better relationship with a colleague but also helps you to get lecture experience in a number of different venues.

TLN: While outlining a teaching philosophy would demand more space than we have here, could you articulate some major principles that inform your teaching?

BO: My approach to both teaching and scholarship is based on the way that I understand the processes of learning – exhilarating, unpredictable, and messy. While it may seem odd, I find a useful metaphor in the stock car race. Like driving a stock car, learning is a highly individualized activity, involving split-second processing, intuitive response to surrounding events, and understanding of one’s own capacity and interests. The driver, however, makes frequent pit stops in order to pick up the equipment to succeed; teachers, peers, reading, coursework, and the experiences of life constitute the tools that students will need to form the foundation of many learning experiences. In the race, someone is always ahead while others lag behind, but positions shift radically with flashes of inspiration and moments of doubt. Occasionally, of course, students in the classroom – like stock car drivers – crash and burn. This seemingly unfortunate circumstance – inevitable in either process – is necessary to the continued improvement of skills and the reevaluation of the learning process.

With this in mind, I value adaptability, respect, and inquiry in the classroom. I work to provide an environment in which students feel comfortable taking risks and asking difficult questions, not only of the material, but of themselves and the world around them. At long last, I find that I am nearly comfortable responding to a question with “I don’t know,” and that I am now excited by the prospect of learning new material with my students. For me, the reality of theatre’s place in a liberal arts education means that students should graduate with the ability to move into a variety of different fields. And so, although students are expected to gain basic practical skills such as writing, problem solving, and critical thinking, they should also learn traits that will extend to a pattern of lifelong learning – intellectual curiosity, the realization of personal morals and the implications of those beliefs, an understanding and appreciation of diversity, and the ability to collaborate with both friend and foe.

TLN: Would you briefly describe a moment or two from your experience as a teacher that you are likely to remember for a long time? What makes that scene (or those scenes) memorable? How have they affirmed or altered your teaching?

BO: I recently had a memorable experience in my Introduction to Theatre discussion section. A student asked a question about what I had always considered a fairly uninteresting and basic term used frequently in theatre. This student had thought about the term in an
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entirely different way, however, extending it far beyond a simple term and into a conceptual and psychological question about its origins and the people who pioneered it. I was struck by the level of thought that the student was operating on, and several other students in the class soon joined in on the conversation. A simple review session had become a conceptual debate about the origins and intentions of Realism in the theatre. This moment will stay with me as a reminder of the importance of free inquiry in the classroom, and as a golden moment when a student reminded me to take nothing for granted.

TLN: Could you share one or two suggestions for new teachers, perhaps some guidance that seems particularly important but might be overlooked?

BO: Remember your own personal joy and enthusiasm for your area of specialization and your teaching.

Start out tough and relax as the semester goes on. This establishes authority early on and lets the students warm up to you as the semester (and course content) gets tougher.

I view lectures as a performance in which I play a character – I choose three main ideas that I want them to understand and script it out so that it includes all the information they need as well as humor, interesting (and pertinent) anecdotes, and questions for further thought. Watching the students will usually tell you everything you need to know about pulling their attention in and keeping it.

TLN: What sorts of mentors have you had? What are the best experiences you’ve had while under their guidance?

BO: I had the privilege of working with a number of different mentors, each with unique strengths and weaknesses. My personal preference is for the sort of mentor that cultivates a good working relationship based on skill, respect and trust. I find that it is important for me to trust that my mentor has the wisdom to help me in potentially explosive situations, and that he or she trusts in my ability to work with students in the classroom. The most difficult situations arise when this relationship is tarnished in some way, and can easily end with students feeling that the course is unbalanced or unfair.

A few other notes…

Even though finding a job may seem like it’s a long way off, begin to collect information for your teaching portfolio now. Ask students if you can keep copies of papers you’ve graded, and keep track of teaching evaluations. It’s a monumental and time-consuming task to create something that really reflects all that you’ve achieved in the time spent at UMCP – staying current helps prevent you from forgetting anything important.

I am very glad that I joined the UTLP program – it has helped me to realize the resources available on campus and provided an impetus for me to think critically about my teaching choices. More and more I am realizing the difficulty of truly good teaching, and find myself eager to try new approaches and ideas in the classroom.

The views expressed above are those of the interview subject and do not necessarily reflect those of the Center for Teaching Excellence.

University Teaching and Learning Program

The University Teaching and Learning Program (UTLP) is an elite cohort of graduate teaching assistants who come together informally to discuss aspects of teaching and learning, engage in mentoring relationships, and create their teaching portfolios. UTLPers have a common commitment to improving undergraduate education and an eagerness to make their classes the best that they can be.

Supported by the Office of the Provost, UTLP is administered by the Center for Teaching Excellence and coordinated by Peggy Jerome Stuart, a graduate student from the department of Education Policy and Leadership. For more information about the UTLP, contact her at mjstuart@umd.edu.
teaching clickers provide a powerful learning system that allows students to become peer teachers and collaborators. Students perceive an increased ownership of the course content.

And because student responses can be anonymous, clickers can be used to poll about controversial or sensitive matters; students with what they fear are unpopular views are more able to indicate those views without fear of embarrassing exposure.

Clickers alone will not make every large class an engaged class, but they do make possible the sort of adaptive teaching that would otherwise be impossible. In many cases, teaching and learning are greatly improved.

See Douglas Duncan’s *Clickers in the Classroom*, Educause Learning Initiative’s “7 Things you should know about Clickers” (http://www.educause.edu/ir/library/pdf/ELI7002.pdf), visit OIT’s http://clickers.umd.edu/, or stop by the CTE Library for more resources on the applications and successes of this technology.

**Background**

The University has initiated a two-year pilot project to assess the effects of clickers on student learning and engagement. Clickers are an emerging classroom technology that has been shown to increase student learning and engagement in a variety of disciplines (1). They have been used in introductory physics for several years with positive results, and so over the last year a group of campus faculty, administrators and staff has worked to identify the key issues involved in making this teaching tool widely available on campus.

Among the concerns to be addressed as we make UMD a “clicker friendly” campus, the first was whether the campus would use and support multiple vendors and technologies, or whether there should be a uniform campus-supported system. Although all the systems operate on the same basic principle, the combination of sender (clicker) – receiver hardware prevents systems from being able to cross-talk with each other. The recommendation from the committee was to have a uniform system wherein students could use the same clicker for all their classes. For the pilot phase the committee recommended supporting a radio frequency (RF) TurningPoint system from Turning Technologies. TurningPoint has the ability to collect, evaluate, and record responses from everyone in the classroom in less than a minute, thus transforming a lecture into a more effective learning environment for everyone. For a more complete list of features, please see http://www.clickers.umd.edu/.

**The Campus Pilot System**

The TurningPoint RF system consists of a USB RF-receiver “dongle,” a student-purchased RF clicker unit, software that allows clickers to be registered to individual students and participant lists (these can be downloaded from the class WebCT site), and software that interfaces with PowerPoint to construct learning activities and to then collect, display, and analyze the students’ responses in an Excel type format.

Receivers have been installed in a number of classrooms on campus. The following classrooms are currently “clicker” ready: CSI 1115, Skinner 0200, Shoemaker 2102, Marie Mount 1400, HJ Patterson 0206, and all HHP classrooms. In addition the system is being installed on all technology carts in the Armory. Additional classrooms will be made clicker ready for spring semester. The cost of the RF receiver is $100.00 per classroom or portable computer. Several departments and The College of Health and Human Performance have opted to equip classrooms that they routinely use.

The sending unit, or student click-

**Try Clickers for a Day**

Are you interested in knowing if clickers are right for your class?

CTE has a clicker loaner program where you can borrow a set of RF-clickers and a laptop equipped with the RF-receiver to enable any classroom with an LCD project to be a clicker classroom.

For more information and to sign up to borrow the system contact CTE at 4-9356.

“Clickers..” continued from page 1
er, can be purchased from the University Bookstore for $45.00. This one-time cost provides students with a learning tool that can be uniquely registered to the individual student and used in a variety of classes as the student proceeds through their academic career. Identifying a student with his or her clicker allows tracking of individual student responses for participation grades or extra credit. Students can sell back the clicker to the Bookstore. A number of textbook publishers are now packaging clickers with various texts. It is, however, important to insure that the clicker is the correct one for the system that is being implemented on campus. The advantage of the TurningPoint pilot system is that there are no additional hidden student registration fees, and no requirement that students register clickers with the vendor. The software that collects and analyzes the student response data is licensed by the University and for the pilot period the costs for the campus license are being underwritten by the Provost’s office. Several large classes are using the system this semester.

An alternative to requiring students to purchase their own clicker is for the department or college to secure a set of clickers that faculty can borrow on an as-needed basis to evaluate this learning tool. The College of Health and Human Performance is piloting such an approach. For faculty in other departments, the Center for Teaching Excellence has established a loaner program whereby faculty can try out a portable system that includes both the clickers (either 20 or 50 units) and a laptop with the necessary hardware and software. The only additional requirement is that the classroom has an LCD projection system. With this approach, it would be difficult and time-consuming to link specific responses to individual students. However, assessments of what is working in one’s class, what is not working, and what students understand is quickly and easily obtained.

Faculty interested in testing out clickers in their classes should contact Cynthia Shaw at the Center for Teaching Excellence (405-9356, email ceshaw@umd.edu) for additional information. For general information visit www.clickers.umd.edu or email clickers@umd.edu. For information on equipping classrooms contact Chris Higgins chiggins@umd.edu or Sue Clabaugh src@umd.edu. For information on faculty training and pedagogy with clickers contact Spencer Benson sbenson@umd.edu

Distinguished Teacher Lecture: Richard Keeling, National Center for Science and Civic Engagement

“Connecting Student Learning with Real World Issues: Undergraduate Education in the 21st Century”

Friday, December 9
2:00-3:30
Maryland Room, 0100 Marie Mount Hall

Dr. Keeling has received the highest awards of both the American College Health Association and NASPA, and, in 1996, he was named Health Educator of the Year by the American Association for Health Education. He has received two honorary doctorates in science. His most recent honors are the Bernard Mayes Award of the University of Virginia Alumni Association’s Serpentine Society and the Clifford Reifler Award of the American College Health Association.

Dr. Keeling is most interested in strengthening liberal education, improving our ability to educate students as whole people, and establishing and assessing learning outcomes in higher education. He edited the recently released monograph Learning Reconsidered, produced collaboratively by the National Association of Student Personnel Administrators (NASPA) and the American College Personnel Association.

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**UNIV 798: Introduction to University Teaching, Spring 2005**

This two-credit seminar course will look at current topics and thinking in teaching and learning at the university level. The course is applicable in a variety of disciplines. The format of the course is student-led discussion based around weekly assigned readings. Dr. Spencer Benson, Director of the University’s Center for Teaching Excellence will facilitate the class. Enrollment is limited to 15 students. Meeting times to be arranged.