A&S Educational Policy and Planning Committee
Subcommittee on Innovative Teaching and Learning
FINAL REPORT

From the advent of tertiary education, the standard model for teaching in university classrooms has focused on the transfer of information from teachers to students. Instructors draw on their expertise to select and organize the information they feel students should know, and then use the lecture format to convey that information. Instructors may go so far as to put a considerable fraction of this information on slides that can be posted on-line, making course attendance of questionable necessity for learning the relevant material. Students in this setting typically play a relatively passive role in the classroom, answering or asking occasional questions, but with little meaningful opportunity to engage actively with the material, let alone to learn to construct knowledge for themselves.

There is accumulating evidence that this model is less effective than more active approaches (see Appendix I). If we want students to learn and to retain as much as possible -- and if we want them to develop critical thinking abilities, cultivate the skills necessary for assessing arguments and evidence, and develop the instincts and confidence necessary for constructing their own arguments -- then passive lectures need to be supplemented, and in some instances replaced, by more active and engaging classroom teaching models.

The benefits of this sort of change have been clear in professional schools, where student expectations for "learning a lot" are very high, and where there has been a steady transition away from standard lectures to other forms of more engaged learning. What has become normative in Business School courses, for example, are exercises and case studies where students work in small groups to analyze problems and discuss solutions, and then receive feedback from the faculty member about the effectiveness of different solutions, perspectives, and approaches to problem-solving in the area of interest.

The objective of this Committee has to been to consider strategies that might foster a similar evolution in Arts and Sciences classrooms. We begin by acknowledging that any such evolution must occur voluntarily; the instructor is in charge of his or her classroom, and others should not impose requirements on how they endeavor to meet their teaching goals. We are also convinced that no single formula for teaching can be applied uniformly across different instructors and different disciplines. We do, however, believe that meaningful change in our approaches to teaching can and will occur voluntarily -- and will in some cases be embraced enthusiastically -- if faculty have better opportunities to learn about strategies they can adopt to improve students' learning experiences, and if institutional policies are adopted that emphasize the importance of learning outcomes. Thus, our goal has been to understand how to educate faculty about innovative pedagogical strategies and how to motivate them to embrace experimentation and change.

The core idea that ties research-validated, innovative teaching strategies together is that active student engagement in the classroom can produce a significant impact on how students learn. This idea is not new. The Confucian philosopher Xun Zi articulated it well 2500 years ago: "Tell me and I will forget; show me and I may remember; involve me and I will understand."

Some of the strategies are remarkably simple. They includes examples such as
— pausing once or twice for two or three minutes in a lecture by posing a question and having the students either free write or discuss a response with their neighbor;

— leaving time for an "exit poll", the last minute of class time in which students jot down either the central concept they took away and/or the most confusing point of the lecture (the former helps solidify the concept and the latter provides guidance for beginning the next lecture);

— projecting an image or writing a provocative sentence on the board before class engages the students in the class material before the lecture begins, etc.

More radical departures from standard lectures should also be encouraged. A number of experiments using the case study approach and/or completely flipped classrooms in which lectures are viewed online before class, and class time is spent in collaborative problem-solving activities, are already underway at Columbia with encouraging results. There is a large and growing body of evidence that these strategies work (see Appendix I). Thus, in our view it makes sense to foster an evolution away from standard lectures in many courses.

In recommending such changes, it is important to note that we are *not* calling for a greater effort or time commitment devoted to teaching. Indeed, those of us who have implemented some of these effective techniques have found that it actually takes *less* time and effort to prepare for class when one is not obliged to fill all 75 minutes with a carefully prepared presentation. Active learning strategies mean the students are working harder, while the faculty member is contributing the unique value he or she brings to the classroom — a wealth of knowledge and experience in the subject that can be called on as needed by students as they go about constructing knowledge for themselves.

In arguing for change, it is important to recognize that, as our Committee has done its work, we have discovered that there are a number of remarkable models of innovative and exciting teaching strategies already in place at Columbia that we can draw upon. We have also learned that most faculty have little idea what other faculty do in their classes, and thus these exciting new models remain unknown to others, even to colleagues in the same department. There is currently no forum for faculty exchanges about teaching and little incentive or opportunity for faculty to share what they do. We have also discovered that there are remarkable programs at Columbia's well-funded Center for Teaching and Learning (CTL), but that these programs have drawn modest interest from A&S faculty. It may be the case that the programs themselves need to evolve to better fit faculty interests, or it may be that there simply needs to be a better approach to drawing faculty into existing programs.

Twenty-five years ago, the Arts and Sciences recognized the need to provide greater support for faculty research and created the Tenured Faculty Research Program. This major investment of resources met the competitive demands of the market and provided increased opportunities for faculty to enhance their research productivity. It is now time to invest new resources in the other fundamental roles faculty play at the University: teaching undergraduates and mentoring graduate students. We provide the following recommendations to guide such an investment and to create a culture that encourages and facilitates the highest standards of teaching and learning.

Recommendation 1: The importance of a faculty member's role in teaching and mentoring must be articulated by the University's leadership. We recommend that the Provost, the Executive Vice-President, and the A&S Deans participate in each year's new faculty orientation program to convey directly the University's commitment to teaching and mentoring excellence.

Recommendation 2: To provide tangible acknowledgement of the importance of teaching and mentoring we recommend that all new University faculty (tenured and untenured) be provided with a substantial incentive to participate in CTL programs and/or otherwise engage in activities aimed at enhancing teaching and learning. Specifically, we recommend that, in exchange for developing a new course or undertaking a major redesign of an existing course aligned with best practices, new faculty be provided with the choice of a one-ninth salary increment or the deposit of an equivalent amount into a faculty research account. We recommend that tenure-track junior faculty be offered up to two such opportunities during the time they hold the rank of assistant professor at Columbia.

Recommendation 3: For current faculty, we recommend the creation of a Faculty Teaching Program (FTP) that will award each year a modest number of TFRP-like credits of one-ninth in additional salary or the deposit of equivalent funds to a research account. These grants would, for example, be provided for participation in a major semester- or year-long CTL program leading to the re-design of a major departmental offering that incorporates research-validated methods and improves learning.

Recommendation 4: To generate more effective connections between the CTL and departments, and to propagate the innovations faculty are now adopting, we recommend that each Department be encouraged to designate a senior, tenured faculty member as a CTL liaison who, at least once per year at a regular departmental faculty meeting, will invite appropriate CTL members or other outside speakers to attend and present a demonstration of new teaching practices. Furthermore, we support the notion, recently adopted by the CTL at our urging, that faculty should be asked to lead CTL workshops for their peers.

Recommendation 5: To support the development of innovative and effective teaching and mentoring practices, we recommend that each Department Chair/DGS/DUS (as appropriate) be provided with incremental funds to

—provide additional opportunities for discussion of effective teaching practices already in place at Columbia by supporting intra- and/or interdepartmental luncheon meetings;

—invite a visitor from another institution to discuss particularly innovative and effective pedagogical practices;

—provide modest sums to which departmental faculty could apply for hardware, software, or other materials to facilitate experimentation with new pedagogical approaches.

Recommendation 6: We recommend that in all renovation projects and for any new classrooms, the construction of active learning spaces be given priority. Many faculty who wish to adopt innovative teaching methodologies are frustrated by the atavistic spaces in which we teach. We are far behind our peer institutions in this regard, and recommend that urgent attention be given to this problem, including funds to retrofit some existing spaces to facilitate the adoption of actively learning strategies.

Recommendation 7: To provide formal faculty input and to create a more effective connection between the CTL and one of its principal

constituencies, we recommend that a CTL-A&S Liaison Committee be formed. Members should include at least one senior faculty member from each division and one PhD student from each division with a seventh senior faculty member as Chair. This Committee should report (at least annually) to the EPPC and to the Department Chairs.

Finally, our Subcommittee wishes to go on the record as endorsing the recommendations of the EPPC Subcommittee on Teaching Excellence that:
　　a) asks each department to create a statement on what constitutes teaching excellence in their respective disciplines, to be updated at each ARC review;
　　b) asks each department to review their procedures for documenting teaching and mentoring performance; and
　　c) asks A&S leadership to provide uniform guidance to department chairs on the role of teaching in hiring and promotion decisions.

We hope that through the implementation of these recommendations, our report can help facilitate the evolution of teaching and learning strategies such that the Columbia classroom experience becomes more engaging and effective for both students and faculty.

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APPENDIX I

With greater access to information and open educational resources, what is the value added by traditional classroom learning in Higher Education? What adjustments need to be made to teaching and learning to fully engage students and maximize their learning?

There is evidence that a change in the culture of teaching and learning is needed, moving away from the instructor as *"sage on the stage"* to *"guide on the side"* and students from passive learners to active learners.

Engaging students in their learning
"Students are there, but too often education is being done unto them. Rather than being active participants in the process, they passively observe what the teacher is doing. Learner-centered teachers … realize that students need to be working on learning-related tasks as well. They see the teacher's primary task as facilitating or supporting the learning efforts of students." (Weimer, 2013: 60).

There is evidence from the literature that active learning approaches help students learn more effectively than a traditional lecture transmission approach, as students are doing more than taking notes (Freeman, et al., 2014; Handelsman et al., 2007; Prince, 2004). Active learning refers to "instructional activities involving students in doing things and thinking about what they are doing" (Bonwell and Eison, 1991).

Faculty interested in freeing up class time from content delivery to engage students in activities and interactions, have blended or "flipped" their courses. The "flipped classroom" is a pedagogical approach "in which the typical lecture and homework elements of a course are reversed" (EDUCAUSE, 2012). Student view pre-recorded video lectures or engage in other online learning resource (*e.g.,* open educational resources) prior to class, while in-class time is devoted to active learning and application through discussions, exercises, collaborative projects, etc. Note: the Center for Teaching and Learning provides support for this pedagogical approach through workshop series – RewirED, the "Active Learning Institute: Flipped Classrooms & Beyond," and individualized consultations.

Innovative teaching takes many forms
"Much of what we've been doing as teachers and students isn't serving us well, but some comparatively simple changes could make a big difference." (Brown, Roediger, McDaniel, 2014 in *Make it Stick: The Science of Successful Learning*).

In *Small Teaching: Everyday Lessons from the Science of Learning*, (available as an [ebook](#) through Columbia University Libraries), James Lang acknowledges that faculty are busy and that 5-15 minute interventions into individual sessions and minor changes to course design, assessment structure, or communication with

students are all that it takes to ake significant differences. Small teaching activities enhance learning with minimal investment of faculty time (for preparation and grading) or institutional resources.

This committee recognizes that there are many ways to engage students in their learning. Barkley's (2010) *Student Engagement Techniques: a handbook for college faculty* (available as an [ebook](#) through Gottesman Libraries, Teachers College), provides many examples of strategies that faculty can use in their classrooms.

Supporting Innovative Teaching and Learning
The Office of the Provost has offered a Hybrid Learning Course Redesign and Delivery grant program since 2015 (learn more at [http://online.columbia.edu/rfp--hybrid-courses.html)](http://online.columbia.edu/rfp--hybrid-courses.html). Funded projects can receive up to $20,000 in addition to access to resources and support from the Center for Teaching and Learning.

To date, numerous Arts and Sciences faculty have been recipients including: Susan Boynton, Music for "Using Music Visualization to Enrich Student Learning in Music Humanities" (Spring 2016); Matthew Connelly, History for "Flipping International and Global History" (Fall 2015); Manan Ahmed, History for "Borderlands: A Geo-spatial Seminar in Digital History" (Spring 2015); Darcy Kelley, Frontiers of Science for "Redesign of Frontiers of Science: technology-enabled adaptive learning for instruction in scientific habits of mind" (Fall 2015); and Brent Stockwell, Biological Sciences and Chemistry for "Evaluating the Effectiveness of team-based science learning using a randomized controlled trial" (Fall 2015).

References

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