TEACHING ON THE EDGE

A MANAGEABLE REVOLUTION:
FLIPPING
the Faculty from the Lecture Model to

Faculty members continue to struggle to effectively teach traditionally aged students, who bring very different traits and expectations to higher education (Taylor 2010, 2011). Their issues with academic preparation and expectation, responsibility, esteem and importance concerns, and their use of and dependence on technology are challenging traditional higher education instructional practices (Prensky, 2001a, 2001b; Taylor, 2005, 2006, 2007, 2015; Twenge, 2006).

Learning outcomes and workplace readiness issues have come under increased scrutiny and criticism as the public questions the effectiveness of higher education practices and outcomes when addressing this generation's learning experiences (Arum and Roska, 2011; Hersch and Merrow, 2005; Bok, 2006).

Real and perceived problems can be traced to a very simple cause: the people hired as instructors may not be adequately trained to teach. We employ subject-matter experts, research scientists, and practitioners and then assign them the responsibility of bringing students to particular learning outcomes; a job for which they have not been prepared.

Faculty development around teaching skills is uneven at best, and frequently made available only to those who ask for it. At research colleges and universities, this is complicated by the fact that teaching is often not perceived as the most important part of a faculty member's job. As has long been the tradition, research, grant writing, managing graduate programs, committee involvement, various community and social involvements, and administration may have a greater impact on remuneration, job security, promotion, and tenure than actually teaching, much less developing the skills necessary to effectively teach or to measure student learning outcomes.

So what do subject-matter experts with little or no training on methods of effective college teaching do? They teach the way they were taught, lecturing on the content to passive students instead of applying the data on best practices on bringing students to meaningful, lasting learning outcomes (Berrett, 2014; Weimer, 2002). Anyone who doubts that the lecture model is pervasive need only observe a sample of classes in session at most schools.

A reliance on lecture is the epitome of what seminal writers like Gardiner (1994, 1998) and Barr and Tagg (1995) criticized as the teaching model, where colleges are seen to exist *to provide instruction*. Colleges and universities should exist to *bring about learning in students*. This article is intended to help academic administrators move faculty from the traditional, lecture-based teaching model (hereafter referred to as the *lecture model*) to an active, learning and learner centered best-practices model (hereafter referred to as *research-based instruction*). A succinct summation of the wealth of evidence from learning outcomes research, neuroscience, and cognitive psychology that forms the foundation of research-based instruction is that the one who does the work does the learning (Doyle, 2011; Leamnson, 1999; Zull, 2002). So, most simply, the job of instructors is not to do the work themselves (lecture) but to plan and direct the work of students.

The reasons for moving from the lecture model to research-based instruction – primarily improved learning outcomes – and the corresponding methods are not secret and have been explicated and promoted by many scholars, including Arthur Chickering and Zelda Gamson (1987), Terry O'Banion (1999), Lee Fink (2003), Terry Doyle (2008, 2011), and Linda Nilson (2010) and in the ongoing work of Maryellen Weimer (2002) and Eric Mazur (1997).

One practical and readily accessible application of research-based instruction is the flipped classroom. It is generally attributed to Harvard physics professor Eric Mazur, who is also its most public face and advocate through his model of Peer Instruction (Berrett, 2016; Mazur, 1997). In the flipped

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classroom students are required to prepare for each class meeting, generally at the content level. Student preparation for each class meeting is expected and assessed, and is a prerequisite for full participation in the class session. During class time, students engage in a variety of interactional activities with faculty facilitation. These activities solidify remembering the content for fluent recall and help learners reach higher order cognitive and skills-based outcomes. While there are many active learning techniques that promote student engagement, they have in common that the instructor is coordinating students doing the work of their own learning, as opposed to simply lecturing on content.

Besides improving learning outcomes, the processes of the flipped classroom can increase workplace readiness, as course mechanics are more aligned with workplace expectations than are the processes and expectations of classes based on the lecture model. The requirement that students come to class on time and be prepared helps them develop the responsibility necessary to meet similar expectations in the workplace, as well as helping students acquire basic workplace habits like timeliness and productivity. The active learning format helps students develop communication, cooperation, and interactional skills, also valued in the workplace. As classes move more fully to these best practices, overall workplace readiness and the satisfaction of employers with graduates may increase. It might also be noted that active classes are more engaging for students - and student engagement increases student persistence (Deslauriers, Schelew, and Wieman, 2011; Kuh, Kinzie, Schuh, and Whitt, 2005).

Readers who want more information on the applications of research-based instruction are encouraged to review *Teaching Generation NeXt*, which describes a model especially appropriate for the current cohort of digitally engaged students, briefly described below (Taylor 2010, 2011, 2012).

TEACHING GENERATION NEXT MODEL SUMMARY:

1. IMPROVE STUDENT FUTURE ORIENTATION

Most students attend college with the plan of entering a professional field. "Don't talk to students. Talk to the professional they aspire to become," is the motto. Faculty members are encouraged to help students focus on the professional they aspire to become, with its requisite abilities and skills. Students may be coached to look past the student roles they currently occupy and to look ahead to the intended goal of occupying a professional role.

2. IDENTIFY CLASS GOALS AND LINK TO STUDENT GOALS

Once students better focus on their future goals, instructors can help them link the desired outcomes of the particular course to their professional goals. People learn what they regard as relevant to them; they care about information and skills that they see as having value to them (Svinicki, 2004). Faculty can help students better understand the desired outcomes of the course, and how reaching these can help students in their future professional roles.

3. IMPROVE STUDENT UNDERSTANDING OF CLASS EXPECTATIONS

Faculty should not assume that students know what they need to do to be successful learners, especially in classes organized around research-based instruction. To improve compliance, instructors are encouraged to spend time helping students understand the requirements and process of their class, and the rationales for increased student effort, required homework, and in-class activity.

"WHILE IT IS POSSIBLE TO ADOPT A FLIPPED CLASSROOM MODEL WITH TRADITIONAL TEXTBOOKS AND PRINTED JOURNAL RESOURCES, ONLINE RESOURCES FROM BOTH ACADEMIC AND NON-ACADEMIC PROVIDERS MAKE CONTENT ACCESSIBLE IN VISUAL AND INTERACTIVE FORMATS THAT ARE OFTEN MORE ATTRACTIVE TO TODAY'S DIGITAL LEARNERS."

4. MOVE CONTENT LEARNING OUT OF CLASS

When faculty move the introduction to course content out of class they can use class time for learning activities designed to help students consolidate and recall information, and to develop skills needed to apply the information to new settings (Draves, 2002; Smith, 2008, 2014). To accomplish this, it is necessary to identify or create appropriate materials for students to use in preparing for class. While it is possible to adopt a flipped classroom model with traditional textbooks and printed journal resources, online resources from both academic and non-academic providers make content accessible in visual and interactive formats that are often more attractive to today's digital learners (Taylor, 2012). In addition to this available digital content, faculty can use various technologies to capture content they create. Instructors can make their own best explanation available for students to use in preparation for class meetings through generally easy to use production tools. This capture can be as simple as voice-over of presentation slides. If the instructor delivers the lecture during a class session, each student has one opportunity to experience it. If that same content is available out of class, each student can interact with the content as many times as necessary to remember and understand it (Smith, 2008, 2014). When this out-of-class work has a built-in homework assignment, instructors can check completion before class starts to verify that students have adequately prepared.

5. CREATE THE NECESSITY OF PREPARING FOR AND ATTENDING CLASS

Since a central feature of an effective flipped classroom is that preparation for class is a meaningful prerequisite to participating in the active learning class time, then the instructor must be able to confirm that students have prepared before class activities start. Students who have not done the content-level homework are not prepared for the activities of the class meeting, which may require recall of that content, so unprepared students cannot move into class activities. There are many possible techniques for ensuring both preparation and attendance, including students responding to items via the learning management system before scheduled class times or showing completed homework to the instructor when entering the classroom. A quiz at the beginning of the class meeting using an audience response system to assess preparation can be effective, especially in large classes (Deslauriers, Schelew, and Wieman, 2011). Instructors may want to consider awarding points for completion of homework presented before the class meeting, which also ensures attendance. Faculty members are discouraged from denying admission to the class to unprepared students. Those students might be allowed to complete the homework during class time, possibly for partial credit, while prepared students participate in the active learning exercises.

6. INCREASE CLASSROOM LEARNING AND ACTIVITY AND ENGAGEMENT

While the literature on classroom activities is vast and often discipline specific, the following general processes apply across the curriculum:

Desired Learning Outcome	Suggested Student Activity
Remembering or Understanding	Explain content or ideas to another student
Acquire a particular skill	Observe expert demonstration of skill (may be moved out of class)
	Practice that skill (ideally while being monitored, possibly by another student)
	Teach another student how to perform the skill
Evaluate	Discuss and debate using evidence-based arguments
Care about or see worth in information or skills	To convince the student of its importance, tell another student how this information or skill will help him/her in the future.

> "IMPROVED ACCOUNTABILITY IMPACTS BOTH STUDENTS AND INSTRUCTORS. FOR STUDENTS, INCREASED ACCOUNTABILITY IS REALIZED BY BEING RESPONSIBLE FOR PREPARING FOR CLASS AND FOR ACTIVELY PARTICIPATING DURING CLASS TIME."

7. IMPROVE ASSESSMENTS & ACCOUNTABILITY

Assessment of student learning in many college courses is often limited to a few graded events as required for measures of productivity, possibly as few as two tests. Instructors moving to research-based instruction are encouraged to use multiple, graded, cumulative evaluations, as well as formative assessments of the learning process and of individual student learning, since students learn more from being tested than they do from reviewing content (Dempster, 1997; Roediger and Karpicke, 2006).

Improved accountability impacts both students and instructors. For students, increased accountability is realized by being responsible for preparing for class and for actively participating during class time. For faculty, increased accountability refers to recognizing the obligation to improve educational practices, as described here, to better meet the legitimate learning and developmental expectations of students, their parents, accrediting bodies, governmental and other funders, as well as of the society at large. Faculty assume the role of mentor and coach for learning and the maturation of their students who have usually entered college at a developmentally critical time in their lives. The combination of development and learning are crucial to preparing these students for the workforce and career they choose, and for functioning as competent adults in the culture. This requires instructors to incorporate research-based instruction in order to maximize the learning impacts of our time with students, especially if we aspire to be competent, effective, accountable teaching professionals.

A MANAGEABLE REVOLUTION - FLIPPING THE FACULTY FROM THE LECTURE MODEL TO RESEARCH-BASED INSTRUCTION

An academic culture shift from the lecture model to research-based instruction is not easy but is absolutely necessary if we are serious of about helping students reach lasting, meaningful, functional learning goals, becoming workplace ready, and becoming mature, responsible adults. Academic leaders can help faculty adopt research-based instruction. The change will be revolutionary on many campuses because it is such a major shift in teaching culture away from current practice. With appropriate academic leadership and the commitment to meet the needs of our students, the culture change can be managed effectively and with positive results.

Academic administrators can start with the assumption that instructors are people of good will who, almost without exception, want students to learn and grow in deep and lasting ways. Instructors are passionate about their disciplines, and they want to share what they know. They want students to learn, to mature, and to become more responsible during their time in school.

Academic leaders might also accept that instructors using the lecture model are doing the best they know how, given their training or lack thereof. Faculty ensconced in the lecture model are not only teaching the way they were taught, but they are probably teaching the way they prefer to be taught, since many faculty tend to be abstract, reflective learners, unlike their students who tend to be more concrete (Schroder, 1993).

Instructors will need training on research-based instruction. Higher education faculty, as scholars, may respond to an academic approach: faculty development programs starting with the theory and moving to practice. Readings on learning theory and research-based instruction from the masters like Lion Gardiner (1998), Robert Barr and John Tagg (1995, 2005), Arthur Chickering and Zelda Gamson (1987), and Terry O'Banion (1999) can provide a foundation. Continued exploration can move instructors from theory to technique to practical application through the work of Lee Fink (2003), Terry Doyle (2008, 2011), Linda Nilson (2010), Eric Mazur (1997), Robin Smith (2008, 2014), Mark Taylor (2010, 2011, 2012), and Maryellen Weimer (2003).

Once instructors understand the theoretical and practice basics of research-based instruction they can begin developing specific skills. Training topics might include instructional technologies like content capture (to move content-level learning out of class), adding voice-over to slide presentations, and the effective use of online learning management and collaboration systems. Audience response systems are an especially effective form of instructional technology that have been demonstrated to improve in-class engagement and to facilitate active learning and Peer Instruction (Bruff, 2009; Caldwell, 2007; Duncan, 2005; Mazur, 1997).

Also critical is helping faculty develop skills in facilitating an active learning classroom. Specifically, they need to learn what to do during class time if they are not lecturing. If this training can also demonstrate the techniques, faculty can experience the methods as well as plan to use them in their classes. These activities can range from Mazur's (1997) Peer Instruction to the techniques

summarized by Nilson (2010) including think-pair-share, pairs check, and jigsaw groups, to demonstrations and problem-based learning. Once instructors have some experience and success with active classes, they may be inclined and inspired to seek out additional techniques. An online search on "active learning techniques in (name of subject)" will provide a wealth of ideas and resources.

Faculty development activities that facilitate understanding of research-based instruction and its impact on student learning can serve to convince faculty of its effectiveness. Introducing them to the vast and convincing literature on the research backing these approaches will likely have an impact as well. When faculty members have contact with instructional exemplars who have been early adopters of research-based instruction and who exist on most campuses, they can come to see that the methods are doable.

In order for faculty to adopt best practices, academic leaders must address concerns over poor student evaluations when faculty members move from the lecture model to research-based instruction. In "Improved Learning in a Large-Enrollment Physics Class," Deslauriers, Schelew, and Wieman (2011) demonstrate "increased attendance, higher engagement and more than twice the learning" in the experimental group using "research-based instruction" compared to the control group, which was taught through "traditional lecture given by an experienced, highly rated instructor" (p. 862). Results showed that most of the students in the lecture group did not pass the end of unit test, while most of the research-based instruction group did pass. This casts doubts on the ability of students to effectively evaluate their instructors or the instruction they receive using traditional end of course evaluation tools. Traditional student evaluations might be replaced by other measures including meaningful assessments of learning outcomes, student evaluations that assess the frequency with which their instructors used best practice, and even live, in-class audits of what instructors and students are actually doing during class time that may or may not demonstrate research-based instruction in action (Berrett, 2014; Smith, Jones, Gilbert, and Wiemam, 2013).

Effective teaching needs to become a priority at every post-secondary institution. While faculty at liberal arts colleges, community and technical colleges, and professional schools would generally report that teaching students is the most important part of their jobs, this is not always the case at universities, where research and grant writing might be more important, especially when employment security, tenure, and promotion are considered. Informal university dynamics can have a chilling effect on instructors moving to research-based instruction, as can peer pressure to avoid "rocking the boat" of traditional lecture-based teaching, which often dominates an academic culture. If progressive instructors are supervised by senior faculty who practice the lecture model, they may be reluctant to demonstrate research-based practices for fear of receiving negative evaluations from those superiors, especially when those evaluations

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might impact progress toward tenure. Universities might want to consider separate tenure track paths that focus more on either instruction or research, with the research track faculty being excused from teaching. Evidence of the demonstration of research-based practice may become a part of tenure decisions for those with teaching responsibilities. As research-based practice brings better learning outcomes, assessments of student learning might replace other evaluations altogether.

CALL TO ACTION

The pedagogy of the past will neither engage our students nor prepare them for the work of the future. Recognizing this, as well as the diverse learning needs of our incoming traditional students, is the first step in higher education reform toward more effective teaching practices. Helping our academic administrators understand the transition from the lecture, passive learning model to more dynamic, active, and research-based instructional practice is essential in providing professional development and support for alternative classroom designs and practices. Hopefully this article will stimulate discussion and ideas that can be shared to provide the leadership to manage the revolution from lecture modes to research-based best practices in our classrooms.

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