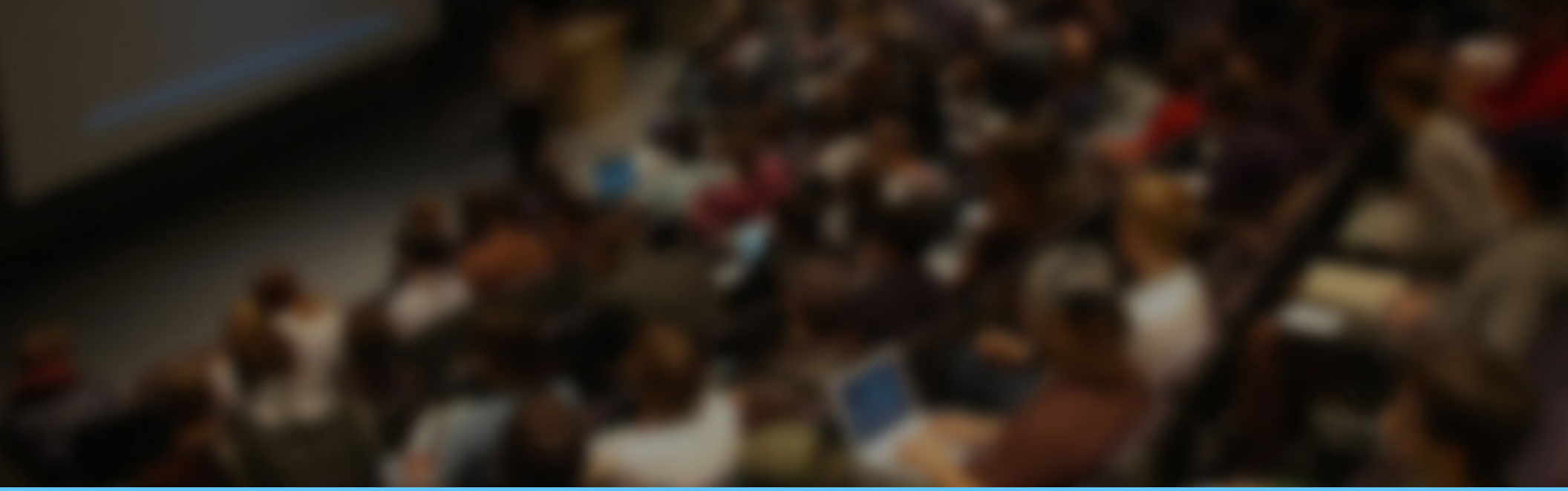

The Modern Educator's Guide

Part 2: The Modern Classroom

TOP HAT

Introduction

The ubiquity of mobile technology has given rise to a new generation of students. In The Modern Educator Guide Part 1 (available for download), we expanded on the new needs and expectations of today's students.

Students have changed and today's classroom has evolved. Modern pedagogies converge in their high valuation of active, productive, and collaborative learning methods (Hoppe, Milrad & Knshuk, 2002). The proliferation of personal technology has allowed modern educators to implement student-centric pedagogies for more effective teaching methods and improved student outcomes.

In Part 2 of the Modern Educator Guide, we cover **the why and the how of student-centric education:** why it is critical to implement student-centric models, and several methods that can be successfully executed through the use of technology.

- **Differentiated Instruction**
- **Flipped Classrooms**
- **Active Learning**
- **Gamfication**

What is TOP HAT?

Top Hat helps modern educators make every lecture count by transforming their students' mobile devices into powerful classroom engagement tools.

- **Poll your students with powerful question types**
  Multiple choice, word answer, numeric answer, click-on-target, sorting, matching and more. Flexible enough for any course.

- **Integrate with your LMS**
  Synchronize your class roster and grades with Desire2Learn, Blackboard, Canvas and Moodle.

- **Automate participation grades and attendance**
  All your students participation marks and attendance records are kept in our easy to use Gradebook. Export to Excel for more advanced analysis.

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GET STARTED FOR FREE

The Modern Classrooom: Why

"Professors need to either embrace the changing technologies or move aside for the ones that will."

– Phil Reiger,
Executive Vice Provost, ASU

"The educator is no longer the gatekeeper to information."

– Jackie Gerstein, *Ed.D.*

Jackie Gerstein, Ed.D, is a modern educator. Although she's been an educator for many years, Dr. Gerstein has never lectured. She's worked with elementary, gifted, and higher education students in an "experiential learning" model, the process of learning through direct experiences.

Dr. Gerstein's courses are hands-on, project-based, and reflective. "I've never believed that the best way to learn is by having someone just talk to you," she says. In this day and age, if you want to learn something, you don't attend a lecture. She also points out that you'd rarely consult a textbook, due to the vast online resources available.

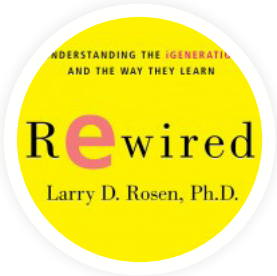
Most educational systems are still driven by educational essentialism, a philosophy in which students are required to learn core disciplines in a teacher-centric environment. In fact, a major component of this theory is that the educator remains the center of focus and the role of the student remains passive. Dr. Gerstein called this into question; information is now readily available at students' fingertips. Therefore, the role of the teacher must evolve from a lecturer to a facilitator, ensuring that students play a key role in their education and personal development. She calls this Education 3.0.

"Education 3.0 is based on the belief that content is freely and readily available as is characteristic of Web 3.0. It is self-directed, interest-based learning where problem-solving, innovation and creativity drive education. Education 3.0 is also about the three Cs but a different set – connectors, creators, constructivist".

Education is no longer confined to four classroom walls.

Mobile devices have allowed for a full transformation of how we perceive education. We've entered a new age of connected learners, continuous learners, expecting immediate and infinite information related to any subject. In E-Book 1, The Modern Student, we described today's student - connected, mobile, and technologically sophisticated.

As a result, today's learners can do anything from watch an instructional YouTube clip to take a Stanford engineering course online. MOOCs, or massive online open courses, have gained popularity with the inception and rapid growth of initiatives like Stanford's Coursera, Harvard and MIT's EdX, Udacity, and the like.



In his book Rewired, Larry D. Rosen, Ph.D, notes that *"From iPods to smartphones to Facebook, today's youth are more plugged in than ever before, and it's increasingly clear that they do not respond to traditional teaching methods – textbooks and lectures – in the same way as previous generations."*

This is a very different educational structure than year's past. Today, online resources exist and serve as educational content providers, while educators provide various pedagogical methods for structure and guidance to ensure comprehension, retention, and a connection with the material. This is why it's more important than ever to adapt today's classroom to a student-centric and active learning environment.

As stated in the blog *"Connected Learning"*:

"We are living in a historical moment of transformation and realignment in the creation and sharing of knowledge, in social, political and economic life, and in global connectedness. There is wide agreement that we need new models of education suited to this historic moment, and not simply new models of schooling, but entirely new visions of learning better suited to the increasing complexity, connectivity, and velocity of our new knowledge society. Fortunately, we are also able to harness the same technologies and social processes that have powered these transformations in order to provide the next generation with learning experiences that open doors to academic achievement, economic opportunity, and civic engagement."

The Modern Classroom: How

"Many highly talented, brilliant, creative people think they're not — because the thing they were good at at school wasn't valued, or was actually stigmatized."

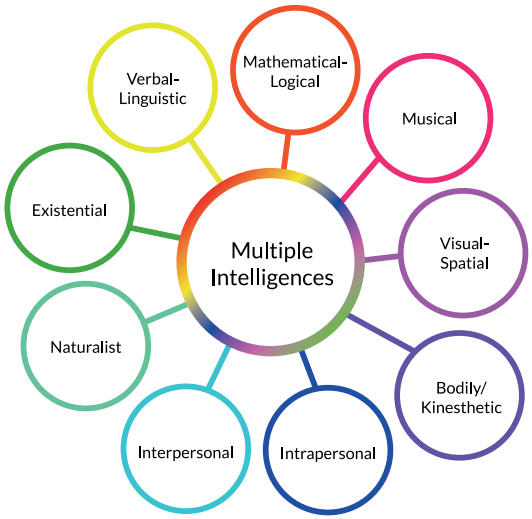
– Sir Ken Robinson

"Technology won't replace teachers, but teachers who use technology will probably replace teachers who don't"

– Via Steve Wheeler,
Associate Professor of learning technology, Plymouth University

1. Differentiation

In small class sizes, differentiated instruction does not require technology for successful implementation. In fact, psychologist Howard Gardner's theory of multiple intelligences dates back to the early 1980s, long before personal technology entered the classroom. His theory proposes nine different intelligences that indicate a broader learning potential and vision of education, encouraging that instructors don't simply lecture to a room full of students.



Instead, the curriculum is adapted to meet each student's individual learning style. Classes become student-focused.

This does not necessarily mean that the teacher is expected to spend each class working strictly one-on-one with the student. Instead, according to educator Carol Ann Tomlinson (2001), he or she can vary at least four classroom elements to apply the differentiated instruction style.

According to Tomlinson, the four classroom elements are as follows:

1. **Content:**
   What the student needs to learn or how the student will get access to the information.
2. **Process:**
   Activities in which the student engages in order to make sense of or master the content.
3. **Products:**
   Culminating projects that ask the student to rehearse, apply, and extend what he or she has learned in a unit.
4. **Environment:**
   The way the classroom works and feels.

Along with differentiation, ongoing assessment and flexible grouping makes differentiated instruction a successful pedagogical method. In higher education, professors of education Deanna Iceman Sands and Heidi Bulmahn Barker (2004) decided to practice what they preach when teaching a

course on differentiated instruction. They took a survey in the beginning of the course to understand each teacher candidate's level of understanding and skill, split students up into different groups, and commenced what they called *"organized chaos."* Sands and Barker conclude that the exercise renewed their commitment to *"authentic teaching"*. They acknowledge that in higher education, it is challenging to transform the a traditional, lecture-based model because instructors in the field are hired as "experts" rather than educators. Sands and Barker's work encourages instructors to move from a *"transfer and share"* model to alternative approaches to teaching that will lead to responsive and critical thinking. However, classes in higher education are much larger and not as suitable for small group instruction. Other higher education professors have expressed this challenge, including Don Livingston, an assistant professor at LaGrange College, who writes, *"Probably, the biggest hurdle to overcome is in the area of content knowledge and assessment."*

Technology makes it easy for professors to conduct ongoing formative assessments. A formative assessment is a form of diagnostic testing in which educators monitor student understanding through ongoing feedback. They can be informal and qualitative, allowing instructors to gauge student attainment and students to identify areas in need of improvement. Often, these assessments are not graded and are purposed as meaningful learning exercises or assignments. Instructors can use formative assessments to recognize student issues and can differentiate instruction to address them immediately. As opposed to summative assessments, which evaluate what a student has learned, formative assessments can be an integral part of the learning process. Ongoing evaluations and feedback from students can shape and strengthen a student's learning path while modifying subsequent learning activities. With the use of online assessment tools, both K-12 and higher education classes are better equipped for differentiated instruction.

Trying Differentiated Instruction in Your Lecture:

1. Conduct formative assessments: Ask questions throughout your lecture by using a student response platform in order to get personalized data and reports.

2. Grouping: Break your lecture into small groups in order to address individual strengths and weaknesses.

3. Flip your classroom: Have students watch a pre-recorded lecture before coming to class, then use class time for questions and assessments.

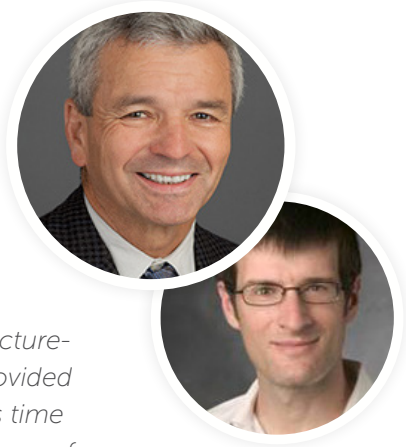
2. Flipped classrooms

An increasingly common student-centric learning model is the "flipped classroom," which leverages modern technology in order to differentiate learning in the classroom.

The flipped classroom turns the traditional model on its head; instead of watching a lecture and doing homework, students learn at home and practice at school. The primary incentive of flipping the classroom is to free up valuable class time. If comprehension is done primarily at home, class time can be dedicated to individual work, group discussions, or peer mentoring. In these classrooms, teachers become tutors. Each student can learn at his or her own pace by watching instructional videos, while in-class exercises allow students to get the one-on-one help they need.

Many educators are producing their own instructional videos in order to stay consistent with technique and tone, yet several online learning platforms are available to support the flipped classroom model. Not only that, but some of these platforms additionally offer problem sets, metrics, and badges. Students are incentivized and teachers are able to track student progress using analytics. In class, students use exercise software to complete problem sets and work in small groups or individually with the teacher based on their results.

In higher education, classes are generally much larger, lectures drive instruction,
and curriculum tends to be less hands-on than in K-12 classrooms. However, it is still possible to flip the higher education classroom.



Charles Prober, MD, teamed up with Chip Heath, PhD, to flip a core biochemistry course: *"This year, our core biochemistry course at Stanford Medical School was redesigned following this model; rather than a standard lecture-based format, the instructors provided short online presentations. Class time was used for interactive discussions of clinical vignettes highlighting the biochemical bases of various diseases. The proportion of student course reviews that were positive increased substantially from the previous year. And the percentage of students who attended class shot up from about 30% to 80% — even though class attendance was optional"*

(Lecture Halls without Lectures — A Proposal for Medical Education by Charles G. Prober).

Professor Wendy Dustman turned to Top Hat to help support her flipped learning format, especially relying on the "Questions" and "Discussions" modules. She uses pre-recorded podcasts of the lecture content, which the students review at home prior to attending class. This way, time spent in the classroom is purely focused on interactive learning. A typical class begins with a quick review of the readings/podcasts followed by a 5-question quiz using Top Hat. Students then break into peer working groups to tackle questions from a case study posed to them. During this time, she and the TAs move from group-to-group to facilitate discussions. Aside from sharing their answers in their groups, each group also anonymously posts their answers on the "Discussions" for the Professor Dustman's real-time review. She uses these as a springboard for discussion for the entire class, as they go through the students' responses and the rationale for answering the way they did. Student attendance is up considerably, and preliminary overviews of student responses are that Top Hat increased student satisfaction. They are also noticeably more engaged, asking more questions and initiating more discussions in class, often linking class content to current events and engaging in higher order critical thinking that Professor Dustman did not see before. Qualitative analysis of the student attitudes/motivation reported in the traditional format (no Top Hat) and blended environment (using Top Hat) is underway.

Try these resources to flip your classroom:

1. Panopto - To record your lectures, power points, screens, and yourself, try Panopto's lecture capture software.
2. Camtasia - For educators interested in more sophisticated editing options, Camtasia is a popular solution. Camtasia also allows you to embed quizzes directly into the videos.
3. Khan Academy - An extensive library of educational content, Khan Academy is a useful resource for students and educators in a flipped classroom.
4. Udacity - Browse Udacity's free, online courses to see if content applies to your subject and may serve as an additional resource to your course materials.
5. TED Talks/TED Ed - Have your students watch video lectures from experts themselves. TED Talks teach valuable lessons and can often spark lively class discussions.

For success stories of higher education professors who have successfully implemented this model into their lecture classrooms:

SIGN UP FOR THE MODERN EDUCATOR NEWSLETTER

3. Active Learning

Active learning is a student-centric method which "involves students in doing things and thinking about the things they are doing" (Bonwell, 1990). John Dewey, an educational philosopher, supported this vision long ago, saying:

> *"[Teachers] give the pupils something to do, not something to learn; and the doing is of such a nature as to demand thinking, or the intentional noting of connections; learning naturally results."*

Studies now show that a student's attention span is limited to roughly ten-minute intervals. With *"active learning"* being one of the most effective ways to maintain student engagement throughout the entirety of a lecture, electronic student response systems can help teachers sustain this type of learning by organically encouraging interaction with the material.

Student engagement is one of the most influential predictors of success in college. Through data collected from a physics course, Hake (1998) found that those who were taught using active learning techniques performed twice as well on exams than those taught in traditional lecture format. Furthermore, active learning techniques are linked to improved student outcomes and study habits, especially when multiple formats are utilized synergistically (Woods, 2003).

A simple way to introduce active learning to a lecture is through student response systems. Students use personal response systems to voluntarily submit answers to questions

asked throughout the lectures. Student answers are then automatically collated for immediate display in front of the classroom. Instructors can use this feedback to dictate the remainder of the lecture.

Professors in the physiology department at the University of Melbourne analyzed if an active learning approach, facilitated by a personal response system, would lead to improved student engagement and learning outcomes in large-enrollment physiology lectures for undergraduate science students. Active lectures were found to increase both student motivation and engagement. Students who participated in answering questions achieved better results than students who chose not to.

In fact, students with the lowest scores in a prerequisite course (previous semester physiology exam marks of < 60%) showed significantly better outcomes from the use of clickers than both middle-achieving (60-75%) and high-achieving (>75%) entry students.

Best tips for using student response to facilitate active learning:

- Use student response for assessments and opinions: Ask your students their opinions or their feedback as ungraded opportunities to participate.
- Use student response for low-stakes assessments: Not simply a replacement for tests or quizzes, communicate to your students that the value of this tool is to improve the learning experience and student outcomes.
- Try peer learning: If there is disagreement around a certain question, have students discuss their opinions and rationale in small groups.
- Explain the benefits: Elaborate on your objectives; student response systems are meant to increase collaboration, engagement, and communication in the classroom.
- Use the data!: You have powerful analytics sitting in your student gradebooks. Be sure to view this as an opportunity to see what isn't sticking with your class as a whole and with individual students.

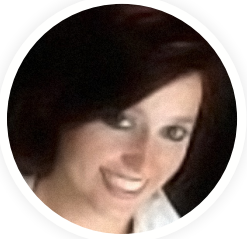
4. Gamification

Modern educators are also motivating students through game-based learning.

Games increase motivation through engagement. Nowhere else is this more important than education. Nothing demonstrates a general lack of student motivation quite like the striking high school dropout rates: approximately 1.2 million students fail to graduate each year (All4Ed, 2010). At the college level, a Harvard Graduate School of Education study "Pathways to Prosperity" reports that just 56% of students complete four-year degrees within six years. It's argued that this is due to current systemic flaws in the way we teach; schools are behind the times. It's been proven that gamifying other services has resulted in retention and incentive. For example, website builder DevHub saw the remarkable increase of users who finished their sites shoot from 10% to 80%. So, in theory, it should work for schools as well.

Educators have tested this theory and seen positive results. There are a variety of ways to introduce your classroom to the gamification of education and we're providing you with just a few ideas! We hope to spark a discussion on gamifying education so that educators can discuss the topic more thoroughly and provide examples in which they have used gamification to make learning more engaging.

For example, Lee Sheldon, a professor at Indiana University, gamified his course by abandoning grades and implementing an "experience points" system. Students' letter grades are determined by the amount of points they have accumulated at the end of the course, in other words, by how much they have accomplished. Because of the extracurricular interests of the current college-age generation, Professor Sheldon attributes success to the fact that "the elements of the class are couched in terms they understand." Students are progressing towards levels of mastery, as one does in games. As Penny Arcade TV puts it, "each assignment and each test feels rewarding, rather than disheartening." Penny Arcade also suggests that educators align levels with "skills" in order to highlight the inherent value of education.



Celine Mondry, a teaching assistant in the School of Business and Economics at Wilfrid Laurier University, uses Top Hat's tournament module to engage her students. Previously using iClicker to quiz her students on the assigned reading, Celine

found that the use of the tournament function egged on some competition, boosted morale and got her students excited about demonstrating their understanding. Celine additionally noted that the tool worked as a great equalizer among students. Introverts were able to demonstrate their knowledge of the material and participate without having to raise their hands. Most of all, "gamifying" the review of readings simply boosted the general energy of the class. Something that can be particularly challenging during the early morning seminars.

> *All students know what a "quiz" is - and frankly, they're rarely excited about it. But a "tournament" is a completely different experience. A "tournament" still tests the students on what they have to prepare for class but it does so in a way that is new, exciting and engaging. Class is always more lively after a tournament, and it's great to see students get engaged and attached to the material they are studying. Wrong answers to tournament questions aren't seen as "Shoot, now I've lost marks." but "Shoot, I need to prepare more for next time so I can beat all my challengers!". It's a huge shift in thinking.*
>
> –Celine Mondry

Try one of these gamified learning activities:

1. Gamify grading - Try Lee Sheldon's idea and tie "experience points" to students' accomplishments.

2. Award students with badges - Western Oklahoma State College is implementing this form of gamification into their technology classes, with badges like "Moodle Noob No More," or "Drop It Like It Hot" to indicate mastery of Dropbox.

3. Try integrating educational video games into your curriculum: The use of games allows students to fail, overcome, and persevere. Students are given a sense of agency—in games, they control the choices they make, and the more agency students have, the better students do. Instantaneous feedback and small rewards (or big ones, like winning) are external motivators that work.

4. Stir up a little competition: Use Top Hat's tournament feature for a dynamic way to test student understanding!

5. Implement a class-wide rewards system: Encourage camaraderie among students by setting up a rewards system where students achieve something as a team. For example, set a goal of 80% of the class passing an exam.

Conclusion

The changing paradigms of education are putting students in the driver's seat. No longer is the role of the educator to deliver course content. Instead, the modern educator leverages technology to develop student-centric environments through various pedagogical methods.

Share this book with your colleagues and teaching assistants to get them thinking about how to apply these concepts in their labs, lectures and other academic pursuits. Also, be sure to tell us about how you are using these modern classroom techniques so that we can learn from you.

In Part 3 of the Modern Educator Guide, we dive into stories of modern educators using Top Hat to improve student experiences and learning outcomes. **Request your copy now to receive it for free**.

ARE YOU A MODERN EDUCATOR?

TOP HAT