Turning the Flipped Classroom Upside-down

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Turning the Flipped Classroom Upside-Down

Ever since computers arrived in classrooms, educators have struggled to find a comfortable place for the devices in curriculum and instruction. For a decade, “technology integration” was the mantra of educational technologists, and it came to be applied to any activity that included a powered-on computer. More recently “flipped classrooms” has become the mantra of educational technologists.

Flipped classrooms are those in which the teacher has leveraged online video to replace face-to-face instruction. With instruction transferred to homework, class time becomes available for working problems. While this does allow students to control and repeat instruction as needed and for teachers to provide guidance, advice, and clarification while students work problems, the model is criticized for its limitations. A lecture delivered via video is still a lecture, and much of the face-to-face interaction between teachers and students simply repeats and reinforces the video lecture rather than providing authentic experiences.

For many, a flipped classroom is still an industrial-age classroom but with lessons accessed via computer. By developing a more-sophisticated understanding of flipping, teachers can reinvent curriculum and instruction. This article outlines some aspects of that understanding that emerged from several years of work with educators.

Upside-Down Classrooms

Long before flipped classrooms became an accepted pedagogy, my colleagues and I had been exploring the use of online video and other media, including interactive web sites and simulations in our classrooms. In addition, we were exploring the many ways that virtual classrooms supported our students and eased our work managing curriculum and assessments. We had discovered that many instructional tasks that we had done in-person could be easily accomplished by students independently. When first hearing about flipped classrooms, a colleague observed, “we have been doing this for a long time, but we do it better.”

As we reflected on the model that was promoted in the flipped classroom literature, we saw an instructionist pedagogy: Students were to be told what is important and how to perform procedures via video, and teachers reinforced that information and those procedures via guided practice. To differentiate our classrooms from those portrayed as flipped in the teaching literature, we began using the term upside-down classrooms to describe our work.

Flipped and upside-down classrooms share the characteristic of rethinking what is done “in-person” and what is done “for homework,” but upside-down classrooms are also grounded in:

- *Emerging understanding of the nature of learning*—The cognitive and learning sciences are articulating the social nature of learning, the importance of students finding emotional connections to the curriculum, and other factors relevant to learning. These discoveries were only recently elucidated, and seem contrary to much instructionist pedagogy. In upside-down classrooms, we seek to give structure to social learning and build curriculum around complex problems.
- *A new role for technology* —In the 20th century, computers largely replaced typewriters in the curriculum and the Internet was originally described as “the infinite library.” Since web 2.0 technologies first emerged as methods of facilitating user-created content, computers have become increasingly creative devices. In upside-down classrooms, learners consume and create technology, they access and manipulate and analyze data, and they interact with

others via technology. Technology is embedded in the classroom and extends the campus and the population that participates in the course.

- *An increased role of authentic curriculum*—When a classroom is turned upside-down, face-to-face instruction is replaced with activities designed to be active and authentic.

ACE Your Classroom

Middle school educators are familiar with the characteristics of an effective and engaging curriculum, it is part of *This We Believe* (2010). Turning a classroom upside-down is as much about what happens when teacher and students are together as it is about the lessons students complete outside of class. In-person classrooms become places where learners apply what they are studying, find connections to what they already know, and extend the domain of their knowledge. We refer to these activities in which students apply, connect, and extend the curriculum as ACE activities. Project-based learning, arts integration, interdisciplinary units, research, and other authentic curriculum are all examples of the ACE activities found in upside-down classrooms.

Drawing on a survey of research and meta-research focused on teaching and learning, Jan Herrington, Ron Oliver, and Anthony Reeves, scholars from Australia, defined authentic learning which is the model we used when selecting ACE. In general, authentic activities allow students to generate and test their own ideas and replicate the rich situational complexity that is encountered by professionals. In addition, authentic activities include extended time to work and reflect, access to multiple experts who provide scaffolding and other feedback. Further, the products require original articulation and are prepared for audiences beyond classroom population.

During ACE activities, teachers become mentors to students. As mentors, teachers play an important role in guiding students through the particular methods to solving their ACE problems. Mentors also provide coaching and specific guidance so that individuals become more skilled. Further, mentors provide scaffolding and feedback so that products are appropriate for the field and the audiences.

Upside-Down Lessons

In flipped classrooms, homework is predominantly watching instructional videos. In upside-down classrooms, teachers assign a variety of activities to be completed independently.

Video lessons are assigned as they are in flipped classrooms, but the video is used for purposes other than instruction. For example, videos give context within which ACE activities are experienced or videos give a group of students a common experience. In addition, video is used for students to become familiar with case studies or similar complex situations. When working with students to design experiments, I send them to segments of video in which college professors lecture on experimental error; we all drawn on that when minimizing error in the experiments we design during ACE activities.

There are an increasing number of web sites that provide individualized tutorials for students. These can be adapted for *quests*. Once a group of students are introduced to one of these sites, they work through the tutorials with little direction from the teacher. This model is well-suited for aspects of curriculum such as spelling words, math facts, and touch-typing in which individual's performance can be improved through practice.

With the widespread availability of virtual science experiments and primary sources, *data collection* can be turned upside-down. After demonstrating how to manipulate the simulation and

record data, students collect it independently. When they arrive back in class, the teacher plays an active role in guiding students through analysis and building and supporting conclusions. Those skills require support and guidance by an in-person expert.

Upside-down teachers find instructional videos and other media (such as step-by-step tutorials for procedures) contribute to a collection of *worked examples.* Students access the examples on an as-needed basis. My colleagues and I found that our own worked examples sometimes (bit not always) provided more clear instruction than many of the highly-touted sources of video to flip; we point students to both.

Classrooms in which ACE is common are loud places. *Reflection* is a learning activity that requires isolation and quite, Online discussion boards, blogs, wikis, and journals are tools available for the upside-down educator to facilitate reflection away from the din of ACE learning.

Essential Technology

While many tools are available for teachers who seek to use online spaces to support learning, the best choice for upside-down classrooms is a full virtual classroom. These are available from many commercial and open source providers; but a system provided, maintained, and managed by school technicians is essential to upside-down educators.

The virtual classroom provides tools adaptable to all the upside-down lessons. Online tests are good for formative assessment and can be adapted into quests. Worked examples are stored in the virtual classroom, and a repository can be created by teachers with access to the same virtual classroom system. All virtual classrooms provide multiple platforms for reflection as well.

In upside-down classrooms boundaries between online and face-to-face interaction blurs. Access to adequate computers frequently and to a reliable and robust wireless network is essential in these classrooms. Strategies that make it easy for students to bring their own devices is one strategy for meeting this need.

Conclusion

As educators make use of the growing collection of educational media, they have the opportunity to refresh teaching. Many and and diverse aspects of instruction can be completed by students independently using that media. By transferring those to homework, time is available for teachers to mentor students who pursue an authentic curriculum when face-to-face with students. A key factor in the successful implementation of upside-down classrooms is the collaboration between technologists and educators as they design virtual classrooms.

Profile: Dr. Gary Ackerman currently serves as the technology coordinator at the Rutland Southwest Supervisory Union in Vermont. His 26-year career in education has included many years teaching science, math, and technology in middle schools. Gary can be reached at gary@hackscience.net.