

## WHAT CAN THE CLASSROOM LEARN FROM THE MOOC?

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**Abstract.** In this paper, we show how the MOOC can inform classroom teaching by giving exemplaries of model instruction. Toward this end we review what the ideal classroom is, and how the MOOC (massive, open, online course) has superseded it at many institutions. We then indicate that what the MOOC offers does have significant merits and advantages.

**The Ideal Classroom.** The ideal classroom is what MOOC opponents imagine when they make objections to this new mode of teaching and education. In the ideal classroom, students encounter an enlightened professor, giving inspired lectures, engaging students, teaching students, and creating a true learning community. The class is given at desired times, in a well designed classroom, with adequate lighting and comfortable seating. The class is relatively uniform in background, age, and learning experience. The class is small, say 10-15 students. This allows a closer community, allows instructors to know students, allows students to engage the instructor, relieves the burden on grading for the teacher, and gives the instructor more time for interaction.

The ideal classroom today is mostly a myth. In wealthy schools, it is still possible, but tuition costs exceed the capacity of all but a small percentage of students. In big state schools with more reasonable tuition rates, only advanced courses have small enrollments, but often the instructor's time must be shared by demands for research production. For low level courses, the instructor is beset with class sizes in the hundreds, and with multiple sections. For example, in a class of size 100 students, the average student perhaps can ask two or three in-class questions per semester. Many are intimidated by the huge environment and ask no questions whatever. Not ideal. The modern community college does have many dedicated instructors, has made great efforts to control class sizes, and mostly has good facilities. However, too many of the courses are taught by adjuncts, underpaid instructors, without offices, and evaluated by student reviews. This discourages excellence in instruction and transports the learning environment far from the ideal. Let us be clear.

If the ideal classroom really did exist for most students the MOOC and its derivatives would not exist. Technology would be but a reliable assistant. But it is now essential. Even the critics of technology and MOOCs make their cases against them using technology.

**Enter Technology.** About thirty years ago, classroom technology made its grand entrance. In the beginning, when Frank Demana and Burt Waits had the insight and foresight to note that graphing calculators would be an important technology in the decades to come, the goal was clear. Show faculty how to use these gadgets successfully in the classroom. This single idea supported the ICTCM (International Conference on Teaching Mathematics with Technology) meeting for years. The idea was solid and unambiguous; the technology was affordable and tangible, the appeal was cool, and most important it could be mastered by almost everyone. The graphing calculator became an essential part of the course. Knowing how to use it was a part of the course grade. It attracted many true believers in the efficacy of using these handheld devices. Success was essentially limited to lower level courses, up to but generally not including calculus.

Then the computer vaulted into the teaching technology of the day. Probably, around the late 90's, there were enough computers around that most schools had computer labs and many faculty and students had a personal computer in the office or at home. The mission was still to use the technology to help students learn, but the pathway to achieve this was less clear, and over the past fifteen years there has evolved no consensus toward any solution. Each year ICTCM has offered numerous presentations on how this person or that used the computer to help students learn some topic. Faculty are polarized on the use of computers in more advanced courses. One problem for this is that there is little serious research that studies the use of computers in the classroom.

In recent years we've witnessed the rise of the applet, of many flavors such as those produced via Maple, Mathematica, Geogebra, MATLAB, HTML5, and Flash. In many cases they take a great effort to create. The design is critical and perhaps this feature is the least considered by authors.

Along came animations, and then even interactive animations also called applets. Many of us thought this was IT. Finally, an applet could walk the student through to success in mathematics. Unfortunately, there is not enough published research that supports this goal. Many publishers have spent small fortunes on building supporting applets around various textbooks. Some are fantastic.

The video popped-up and is today a dominant feature of online and traditional courses. It helps students learn mathematics through convenience. Multiple views are possible, making clear concise any-time, any-where instruction a reality. The Khan Academy has taken the video to ultimate level with knowledge maps and literally countless videos on almost every topic.

Learning management systems, such as Blackboard, have taken technology in another direction, partly to supplement the contemporary and inadequate teaching/learning environment. These support online homework, online exams, exam prep videos, MOOCs, learning analytics and big data, social media, and bridging interventions.

Nowadays, technology has moved away from the gadget and is moving toward services. What's important for students? Typical surveys include these questions.

- The instruction in my major field is excellent. Nearly all of the faculty members are knowledgeable in their fields.
- The quality of instruction I receive in most of my classes is excellent. I am able to register for classes I need with few conflicts.
- My academic advisor is knowledgeable about requirements in my major. My academic advisor is approachable
- Tuition paid is a worthwhile investment.
- I am able to experience intellectual growth here. It is an enjoyable experience to be a student on this campus. There is a good variety of courses provided on this campus.
- Major requirements are clear and reasonable.
- The campus is safe and secure for all students.
- Adequate financial aid is available for most students.
- Faculty members are fair and unbiased in their treatment of individual students

As the great American philosopher Eric Hoffer, in his *Reflections on the Human Condition* (1973) tells us,

*“In a time of drastic change it is the learners who inherit the future. The learned usually find themselves equipped to live in a world that no longer exists.”*

**Enter the MOOC.** The MOOC (massive open, online course) is here to stay. Excellent materials are available through Coursera, Udemy, EdX and many other venues. The MOOC is at once the scourge and salvation of education. It really cannot be both. It is difficult to understand or perceive how traditional education can survive without the assistance of technology, and how many courses can be taught without the “massive” component. It is an easy conclusion to make that education and healthcare may soon be competitors for valuable domestic funding. Both involve massive public expenditures. Like applications of technology to healthcare, the MOOC addresses the exigencies of cost, effectiveness, and quality. In particular, the cost of education dominates the thinking of all interested in methods of how we create educational environments. The MOOC has friends.

- SMOC – (smock) synchronous, open, online course
- COOC - classically offered online classes
- MOOT – massive, open, online, test: ACT/SAT, PSAT, Placement Exams, GRE, EOC exams, or massive, open, online, textbook
- POOC – Publisher’s open online course

These are specialized variations of the MOOC, sometimes combining aspects of traditional instruction as with the SMOC and COOC, sometimes a wide scale testing environment, and sometime a commercial venture. Aspects of MOOCs include

1. Better use of technology

2. Clearly defined learning outcomes.
3. Polished lectures available any time.
4. Clearly vetted testing.
5. The use of videos for students.
6. The use of chat rooms for students to focus their attention on topical questions.
7. The availability of learning analytics.
8. A fixed syllabus.
9. Students participating learn independently.
10. Exams test the material and possible questions are not telegraphed by the teacher.
11. Students are not constrained by location, inadequate classrooms, bad parking conditions, disengaged teachers.
12. It connects across disciplines and corporate/institutional walls.
13. Contextualized content can be shared by all.
14. They move beyond time zones and physical boundaries.
15. Encourages a pathway toward lifelong learning. The MOOC forces you to think about your own learning and knowledge absorption.

A long list, it suggests, as intended, the many advantages of the MOOC. Traditional teaching offers the immediacy of instruction, the eye-to-eye communication, the actual physical presence, and all these entail. However, in comparison a poor instructor comes up wanting; a great instructor comes up as superior, but for advantages beyond its scope. The MOOC, however, is not for the faint of heart. It requires a strong commitment, as attested by the high dropout rate. It also requires personal discipline and intellectual independence, not the strongest suits of struggling learners.

Look at the six big technologies of this decade. They are the flipped classroom, learning analytics, 3d printing, games and gamification, the quantified self, and virtual assistants. It is clear the flipped classroom, roughly requiring students to review material prior to class time, was inspired by the MOOC. Learning analytics is a consequence of learning management systems. A fully new source of learning information, learning analytics will keep educational researchers busy for decades to come. The quantified self, new to some and related to learning analytics, is a model where students are able to closely track data that is relevant to their daily activities through the use of technology. As well, it is used in self-tracking, peer comparisons, early warning, and characteristics identification. Some are new, possible only because of technology, but are part and parcel of the MOOC.

In the MOOC the professor speaks clearly, without rancor, without judgment, and without personal and other irrelevant distractions. The lectures have a clear perspective, goal, and are completed on time. How many of us remember having instructors rambling on about inconsequential and sometimes personal matters during valuable class time. When one thinks of the best teachers ever had, how many are on this list? Maybe a half-dozen? Yet, in the typical the academic career from high school through college, more than sixty instructors played a role.

That is, about ten percent of your past instructors remain in your memory. Not very large, this number suggests that vaunted live classroom instruction may not measure up to exemplary standards.

**Conclusions.** Indeed, these many advantages suggest important lessons for the classroom instructor. It was partly the perceived inadequacy of traditional instruction that inspired the use of technology to make instruction better. Make no doubt, if traditional instruction offered clear and universal advantages, it would be sustained. It seems this is not so, except for students with certain learning disadvantages. However, the lessons learned from MOOCs can be reflected backwards. We can be confident that the MOOC, which is here to stay, will inform real, live, and continuing classroom instruction not only today but in the years ahead when both will find their sustained and proper role in the education of all students and citizens at large.

I like MOOCs. They offer high quality instruction to many that was not available previously. I don't like MOOCs. They diminish my human and humane contact with an actual person.