

## *The Moore Method: Viewpoint of a Department Chair*

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### **Abstract**

Having one or more faculty members who are pedagogically adept with the Moore method is, in my opinion, a real asset in a mathematics department. Bringing such a faculty member into a department where the Moore method is not already an accepted component of departmental culture, however, is not without some professional risk: (a) risk with students unaccustomed to a Moore-method classroom environment, (b) some risk perhaps with departmental faculty who themselves have little or no experience with the Moore method or are concerned about its potential impact on the overall curriculum, and (c) risk with college-level administrators who may be responsive to complaints from students in Moore-method classes.

For many students, the first experience with a Moore-method class may be a real departure from prior experience and a real challenge to the existing comfort level with mathematics. Students often come to college thinking of mathematics as a body of facts to be learned and of the faculty as purveyors of those facts. A common complaint from the student in his/her first Moore-method class is “Dr. X does not tell us anything. We have to do all the work.” or “How am I supposed to know if the work other students put on the board is right? Dr. X will not tell us. S/he just asks another question. If I knew the answer to the question already, I would not be asking!”

In the initial months -- perhaps even years -- when a new Moore-method faculty member joins a department, administrative support is critical in responding to student comments and complaints. The support of core faculty in the department is equally important, for students often complain first to an advisor or other faculty member, perhaps even one in a different department who is perceived as sympathetic. Moreover, even core faculty who are supportive of the Moore method in principle may express concern if a Moore-method class is prerequisite to a more advanced course -- especially one required for the major -- and does not, in their opinion, adequately “cover” all prerequisite concepts. Such discontinuities, real or perceived, can present a genuine challenge.

As the Moore method becomes more pedagogically accepted and any “rough spots” in the coherence of the curriculum are worked out by the department, student comments and

complaints tend to recede and support from peer faculty increases. This evolution, however, does not occur overnight. It requires patience and some strategic discussions between the Dean and the department chair, so that the Dean has adequate understanding of what the department is doing and is not blind-sided.

In time, important and positive outcomes from the Moore method will likely accrue. These can include papers in which students present the products of their own work, work that began in a Moore-method class. Student papers presented at the Mathematical Association of America meetings or published in undergraduate research journals invariably bring praise from Deans and other administrators. That praise is important in making the case to support the Moore method pedagogically and in counteracting some of the student complaints that invariably reach the ears of the Dean.

Other important and positive outcomes include the verbal reports of students who go on to graduate school and return to tell the department's underclassmen about how well their Moore-method classes prepared them.

The mathematical growth in the students who learn to engage well with Moore methodology is perhaps the most important and satisfying outcome. When the conversation in the faculty common room turns to particular students whose mathematical sophistication has noticeably matured in or following Moore-method courses, the department can take pride in the outcome that matters most.

As a former department head in an institution that chose to hire and support a faculty member who was (and still is) adept in the Moore method, I have encountered all of the challenges described above. As is the case with any pedagogical approach, the Moore method can be implemented well or implemented poorly. Our faculty member did it well. So, along with the challenges, there were important accomplishments. Our department benefitted from many wonderful outcomes of our Moore-method classes, including a number of student papers published or presented at mathematics meetings, some jointly with our Moore-method professor. Reflecting back, I have no doubt that

good decisions were made to hire and advance our faculty member, decisions that I would support again in a heartbeat. Based on our experiences, however, I have a few observations that others may find helpful:

- It is important to understand the essentials of the Moore method yourself. Building support for the Moore method means taking time to explain its basics, especially to those outside mathematics whose support will be critical.
- One should not be “put off” by student complaints, particularly in the early years of Moore-method classes. Some students will comment or complain about *any* class taught using the Moore method. The real problem starts if those complaints get to the Dean and the Dean is sympathetic to them. Anything the department chair and faculty leaders can do to educate the Dean in advance is worth doing. The regularly-scheduled discussions that typically occur between a department chair and a Dean are an important vehicle for keeping the Dean informed. Support for the Moore method among a critical number of the department’s core faculty is equally important, both in (a) calming the more immediate student complaints that surface in the department and (b) bringing an informed perspective to the formal student evaluations of Moore-method faculty in departmental and college/university promotion and tenure deliberations.
- Some discontinuities in “content coverage” between Moore-method prerequisite classes and more advanced mathematics courses that build on the content should probably be expected. These discontinuities, real or perceived, must be addressed. In some instances, discussion among the faculty teaching the relevant courses may be all that is required. In other cases, faculty teaching assignments may need some serious thought. While the Moore method certainly adds value to the study of mathematics through the habits of mind that it promotes, it can take more classroom time than traditional methods of instruction to “cover the syllabus,” thus potentially compromising “content coverage.” The benefits and liabilities of the Moore method must be honestly addressed, so that issues of curricular coherence are not swept under the rug.
- It is possible to use the good outcomes from Moore-method classes to strategically publicize the value of varied pedagogical styles in the department. High quality student papers and other student research efforts that trace their origins to Moore-method classes provide especially effective evidence to make the case. Moore-method faculty have opportunities in this context to both demonstrate their mentoring abilities with students and contribute to the base of evidence that supports the efficacy of the Moore method, and they need to capitalize on those opportunities.
- It is well worth staying the course. There is value in having divergent pedagogical styles in a department and in having faculty who espouse those styles. The Moore method promotes valuable habits of mind akin to

mathematical research and investigation. It deserves a place in the department's pedagogical portfolio.

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