



2007 Annual Meeting of the Higher Learning Commission

Leading for Common Good

Hyatt Regency Chicago - April 20-24, 2007

College-High School Partnerships in Improving Students Performance in Entry-Level Math Education

The Austin Business Academy Experience: A Teacher's Perspective

Michael Kolody

Austin Business Academy – Chicago Illinois

With contribution by

Abour Cherif and Patrick Mayers

With Introduction by

Timothy H. Ricordati, Ed.D.

Introduction:

"Austin Business and Entrepreneurship Academy is a high school created under the Chicago Public School Renaissance 2010 program to provide students and their parents in the Austin community with access to a unique school with a rigorous curriculum, high standards, and a safe and disciplined environment. The mission of the school is to prepare young men and women with the academic foundation, business knowledge, social skills, and practical experience to enable them to pursue economic opportunities for themselves and create economic opportunities within the Austin community. The school opened in August, 2006 with just over 200 9th grade students.

Unfortunately, there was not only a wide variable in the math competency levels of our incoming freshman class, but their average math comprehension was just under the sixth grade level. We needed to identify a methodology and tools to close this achievement gap among our freshman. Through the generosity of DeVry University, they made available to us the DeVry University System-Supported Mastery Learning Math Program, based upon MyMathLab by Pearson. This program has enabled our students who are at a variety of math competency levels to work at their own pace to master the concepts and skills necessary to succeed. In addition, DeVry University has given it's time and resources to ensure the success of the program, and ultimately the success of our students."

Timothy H. Ricordati, Ed.D.

The Austin Business Academy Experience: A Teacher's Perspective

Michaem Kolody

Austin Business Academy – Chicago Illinois

Austin Business Academy students are a tough group. Only four students out of 203 total students tested at grade-level, and 91% of the student population qualifies as “low-income,” which means that the majority of students come from homes with incomes sufficiently low to make the students eligible for free or reduced-price lunches, from families receiving public aid, or from foster homes.

The first challenge is the students' lack of fundamental skills. Some students' skills were below even the third-grade level, as revealed in a conversation with one student about the problem, “231 divided by 20,” which revealed his confusion about what a divisor was, where to write the divisor when working a long division problem, even what it meant for one number to “go into” another number. When discussing this problem, the student protested in frustration and outrage that “he did not know about big numbers like that”. His is an extreme case, but even better students have gaps in their knowledge, on the one hand demonstrating an ability to solve complex multi-step percentage problems, but on the other unable to add signed numbers.

A second challenge, which made life especially difficult, was the students' sensitivity and protest against any review of lower mathematics that they had covered before. When students felt they were not advancing or that the math they were given was not at grade level, they protested: “We've covered this before”; “We know this already”; “You think we're slow”; even, “You think we're slow because we're black”. That students did not demonstrate that they in fact did understand the concepts discussed, that students sometimes did entire assignments incorrectly, happily adding together fractions without common denominators for pages, for example, did not deter them in their determination that they needed to move to the next topic. “I already know how to do it; I just don't feel like it,” they said. “I know more about math than you; I'm just not doing it”.* The feeling for most students seemed to be that a passing grade in math meant that you had sat in class for a prescribed amount of time, written down some numbers, and handed those numbers into the teacher. Often these handin's were accompanied with stern warnings: “I better get my credit” as well as the suggestion that they had done me a huge favor by doing their work. One of the most dispiriting moments of the first semester was a conversation with a student who I considered to be quite good, who, when scolded about a her recent decision to take a week or two off work, told me about her plan was to simply copy and to cheat, when it came time for her to take the test.

The final challenge, and maybe the most daunting, is poor study skills. It is a battle to get students to bring even the most basic supplies to class, much less to get them to keep their work organized in a useful way. The level of self-monitoring in students is low or non-existent. After 10 years of schooling the students still do not grasp that homework is not to be done blindly for its own sake, but is done to master a skill.

Many veteran teachers have devised solutions to the problems I have outlined above. A fantastic classroom teacher, at the old Austin Community Academy, really a neighborhood icon, shared with me his advice for tackling some of these problems. For the school supplies problem he recommended clipboards with pencils attached, reasoning that students would be less likely to walk off with a clipboard than just a pencil. For the problem of student protests against review of the fundamentals, he recommended forging ahead, and building review into the introduction of new material. When reviewing second degree equations, for example, fractional values, decimals, or negative values, plugged into such functions, could stimulate discussion of how to do fundamental operations. Review would take place even while the class moved ahead. These were great suggestions and they helped me immensely; nonetheless, I still believe that MyMathLab can help teachers meet even more of the challenges I've outlined.

MyMathLab

First, the computer addresses fundamental skills *directly* in a way that is sufficiently refreshing to most students. I think as math teachers, most of us think it is important that students be able to do at least simple long division problems. With MyMathLab, I am sure that students will understand the basics of the process, as well as the concept behind it. It is simply not possible to pass the MyMathLab class without thinking about these ideas. I can only think of one student who still complains occasionally ("I already know how to do this, but don't feel like it"). She holds the number one rank in the school; I don't recall her complaining lately, and, regardless, she is now a solitary voice. Other students in the class defend the MyMathLab approach: until you learn the fundamentals, it makes little sense to move on to more advanced topics.

The novelty of doing math on a computer, especially for a population without regular access to computers, is certainly part of the draw of the MyMathLab software. The way I run the class, students also have access to a variety of tools and resources which might not otherwise be available. They may use a copy of the multiplication tables. They may look at lists of prime numbers. There are posters reminding students of the divisibility rules for integers. They can use (and eventually will be required to use) scientific calculators. I have noticed that many students, who initially seemed hopeless in their lack of knowledge of their multiplication tables, know them much better after having to look up their multiplication facts over and over again on their way to solving the problems. The

way the MyMathLab curriculum is constructed, it is impossible to rely overly on the calculator. “Find the prime factorization of 687, the LCM of 211 and 53, or the common denominator between 214 and 113. Simplify 513/114.” Problems like these send you to your calculator, but not for doctrinaire, plug and chug type thinking. The computer, the access to helpful resources (technological and otherwise) and direct but stimulating fundamentals questions tends to silence the objections of most of the students. They are reviewing, more directly than in the “move ahead and review” method, but in a refreshing way.

Second, it turns out that even some of the hardest to reach students can benefit from MyMathLab, something I was really worried about after the first week or so of the implementation. The student in the “below third-grade group” who did not know what a divisor was, where to write the numbers when doing long division, etc., was able to make significant gains with some one-on-one help. He is doing much better now. It is hard for him, but he is more organized than most students. He has his multiplication table, his prime numbers list, and his divisibility test sheet and he has these stapled into his notebook. He has been using these with a four-function calculator to solve the problems. He did virtually nothing in the traditional class, and got a straight “F” in the course. He gets lots of practice looking at multiplication tables in this non-boring, non-repetitive setting. Some of the stuff he needs to look up, he needs to look up over and over again (i.e. $7 \times 7 = 49$) providing a real motivation to familiarize himself with basic facts.

I put progress charts on the wall. These are a crucial part of the success of the project. Students get to place a sticker on the chart on the wall when they have finished a unit. I let them choose which sticker they want and I let them stick the sticker on the chart. They also print the record of their passing their exams and they get to staple these to a bulletin board reserved for that purpose. These activities are outlandishly gratifying for most of them. They like choosing, they like sticking their sticker, and more than all of that, they like the sense of satisfaction they get from passing the test. Maybe only once or twice did I see a student excited at an accomplishment in the traditional class, but I saw it any number of times, when students passed the first MyMathLab exam. They didn’t cheat; they didn’t manipulate their way through – they really did it themselves and they were excited. I am looking into getting a gong that students will be allowed to hit only when they pass a test...

The progress charts have a remarkable effect on students who are behind. Once a critical mass of students earns a sticker, it is hard for poorer students to convince everyone else (or themselves) that it is anything but their own performance that has lead to poor grades. Even some of the worst students with the worst attitudes seem to care about passing the exam.

With groups with a lot of poor students, extra manpower really is necessary. The really low students need someone to sit with them periodically – sometimes for an extended period— to hold their hands while they work— until they are ready to

work on their own. Another student, for example, has made a lot of progress, but in direct proportion to the one-on-one help he receives. Students get frustrated because I can't make it to all of them, and sometimes they do give up and cause behavior problems. Ideally, for a really demanding group of 25 students, you should have as many as 3 people, all of whom are sufficiently comfortable with math, so that these students can succeed.

One student is far ahead of everyone else. He was a huge behavior problem in the traditional course; he does tend to work on the MyMathLab work at home, so he is occasionally still a problem in class. Regardless, he has made huge gains. I do want to stress that every student, from highest to lowest, is doing more math than he or she was in the traditional classroom.

Finally, MyMathLab also helps with the students' lack of self-monitoring and their poor study skills. DeVry donated, in addition to the software, spiral bound notebooks for every student. These are kept in a file cabinet, locked and labeled for each class period. Students enter the classroom, get a pencil (which is provided) and their notebook. They are expected to write their work in a neat and organized fashion in their notebooks as they do their work. It was not obvious to me how crucial these notebooks were, and how important they would be in teaching students study-skills that would be useful not just in math, but in all aspects of their academic careers. Many students sailed through the homework (for which the computer offers help) but failed the test and pretest which do not provide help. Some students took the pretests or the exams ten times or more before passing. But what is slowly dawning on some of them is the way in which an organized notebook - and notes which are written down neatly with directions on how to do problems, advice on sticking points, etc - can help them save time in the end by helping them learn and master the material. One of my favorite stories is about one student, very frustrated, who got an F on her progress report because she could not pass the Chapter 1 Pretest. The mother called a conference and was at first very aggressive with me. "She had a B last semester. How can she have an F now?" But when she saw her daughter's notebook (compared to a good notebook), the conference was over, and her daughter was filling in the notebook correctly. With her own notes to help her, she soon passed the test that she had found so frustrating. I was very excited because she had now not just been told, but demonstrated for herself, how to do her work in such a way that she was really learning the material instead of just doing it to fulfill an assignment. In this, she is learning self-monitoring and developing the attitudinal and organizational skills she will need to succeed not just in math, but in all courses.

I am emboldened by this victory. It is an ongoing battle, but one that I intend to continue. The students almost universally hate to write in their notebooks, and I am amazed at the lengths they will go to not to have to write in them, but I am increasingly enlisting parents. I have made a lot of phone calls, and I am looking forward to report card pickup. The idea is to get as many of them as possible to

think of their notebooks not just as menial, pointless chores designed for my eyes, but instead as useful tools created for themselves to help themselves.

Michael Kolody, MA.

Austin Business and
Entrepreneurship Academy
231 North Pine
Chicago Illinois 60644
812-219-2763

Timothy H. Ricordati, Ed.D.

Vice President, New Schools Development
American Quality Schools
850 W. Jackson Blvd., Suite 275
Chicago, IL 60607
tricordati@aq.s.org
312-226-3355 x229

Patrick Mayers, Ph.D.

Senior Vice President of Academic Affairs, &
Dean of Keller Graduate School of Management
DeVry University
1221 North Swift Road
Addison, IL. 60101-6106
pmayers@devry.edu

Abour H. Cherif, Ph.D.

Director of Curriculum for Math and Science
DeVry University System
1221 North Swift Road
Addison, IL. 60101-6106
acherif@devry.edu