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Sesame Street for the Decision Sciences: Redux

by Rick Hesse, Feature Editor, Pepperdine University

It has been 33 years since my ***Decision Sciences*** articles "Sesame Street for the Decision Sciences" (Hesse, 1974a; Hesse, 1974b) were published, and unfortunately my gloomy and dire predictions about OR/MS courses disappearing from the Business School curriculum came true. But over the years, our profession and professors have righted the ship and steered in the correct direction due to changes in technology (PCs and spreadsheets) and attitudes (practical applications are not a bad thing to show in textbooks or journals, such as *Interfaces*). But unforeseen on the horizon are the shoals and rocks of changes in student behavior that once more threaten our profession and education in general. It is time to revisit this theme and examine the cons of the Sesame Street generation and how it impacts our classrooms today.

Warning and Solution

My warning was that if we didn't stop teaching OR/MS and decision sciences as "math appreciation," they would be eliminated from the business school curriculum. Textbooks were filled with the simplex algorithm, the Hungarian method, and the MODI method shown in painful detail. We needed instead to teach problem solving, and not concentrate on just the mechanics of the algorithms. So, therefore, we needed to simplify but not dumb down; teach quick & dirty (non-optimal methods) that didn't require a mainframe computer. And most important of all, make our teaching applied and practical, showing examples of where and when linear programming, transportation and network models are used. The problem was that most instructors had no experience in actually solving these problems in business or industry. They taught only as they were taught. By using the Sesame Street analogy, I was hoping to generate interest in making the decision sciences fun, entertaining and useful, rather than an exercise in rigorous, endless algebraic manipulations—numbers for numbers' sake. Since mainframe computing was not available to all students in those days, using quick and dirty techniques allowed solutions that were near-optimal with just using paper & pencil or calculators. The risk, though, was of dumbing down the mathematics and making it too simplistic.

Another recommendation was that professors even do pro bono work with public agencies and/or small private businesses – but it was too little, too late, even though a few authors incorporated consulting experiences in their texts (Cook & Russell, 1981 & 1985; Hesse & Woolsey, 1980). The idea was to encourage professors to learn from their consulting and pass on the experience.

The Future Played Out

As business schools continued their growth, more and more students suffered under "pivot, row, cha-cha-cha," and complained about how irrelevant the course was to their education. By 1991 OR/MS was eliminated by the AACSB as part of the required curriculum for both BS and MBA programs (Cook, 2003). Gradually, one school after another eliminated decision sciences in favor of teaching POM (Production and Operations Management). And POM became a simpler version of DS/OR/MS,

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complete with videos and simple math. But gradually professors and textbooks started adding more and more models and algorithms, so that textbooks reaching 800-1,000 pages had enough that a professor could pick and choose and make the course as simple or complicated as she desired, but certainly not a full-blown modeling course. Graduate POM texts became case-oriented, with less modeling, quantitative analysis and more executive decision making. This is not to disparage production and service management, but with business programs eliminating quantitative coverage, it was easier to teach POM than quantitative analysis.

The Tide Turns

In the early 1980s, Gene Woolsey became editor of *Interfaces* (sponsored by ORSA/TIMS) and required that articles have substantiated savings and place any formulas in the appendix. This began to give visibility to applications of LP and allocation models, forecasting, decision trees and other models as useful tools for business and industry. The Edelman Award, started by the College of the Practice of Management of TIMS (later to become INFORMS in the merger with ORSA), gave impetus for companies to tout their analytical prowess in public and in essence help bring OR/MS modeling out of the closet of company secrets. These actions raised the visibility of OR/MS to professionals and a few professors, but not much changed in terms of education.

By the early '90s, with the proliferation of PCs and also spreadsheets (Lotus, Quattro Pro and Excel), the tide began to turn. Not only could simple models be made on spreadsheets, but with the inclusion of the Solver on spreadsheets and What's Best, more complicated models could be done on spreadsheets and did not require a mainframe or a degree in mathematics or computer science to use. Then came such spreadsheet add-ins as @Risk and Crystal Ball to help with simulation modeling. At the same time, mainframe statistics programs such as SPSS and SAS began to offer PC versions that could also do some forecasting. Textbooks on management science began to emphasize problem solving, and applied examples (Cook & Russell, 1981 & 1985; Hesse & Woolsey, 1980) also began to turn the tide towards accepting modeling.

Over the next decade, modeling and problem solving faced an uphill battle, but steadily increased its market. Spreadsheet modeling textbooks began to appear on the market, and some schools began to add OR/MS modeling back into the curriculum, or replace the graduate POM course with it. In 2003, after intense lobbying by many good-hearted souls, the AACSB added OR/MS to the list of topics to be covered in MBA programs. But since the guidelines have been revised, there are no required courses—just topics. The modeling course isn't back to the levels of the 70's, but at least is making a comeback.

Sesame Street Redux: Generation Y

But now even more troubling clouds are on the horizon for teaching quantitative modeling—the students themselves. I teach in a very large, fully-employed MBA program (1200-1500 students) with an average age of 35. These are working professionals who need to broaden their skill set. As C.P. Snow said: "The task of education is to humanize the scientists and Simonize the humanists." But in the last 10 years I think I've seen a deterioration of attitude and no improvement in basic skills, especially in using PCs and Microsoft Office. I see more and more students who lack preparation, have an inability to apply group skills, and lack concentration, yet have high expectations for being rewarded for just showing up (with no sense of being on time). As I communicate with my colleagues from around the country, this doesn't seem to be the problem for just one school, but a trend. Perhaps this Sesame Street generation has gotten used to information given as entertainment in small sound and video bites. *USA Today* has been called "News McNuggets," and many students are convinced that if the information can't be Googled on the Internet, it doesn't exist. They believe that Wikipedia is a real encyclopedia. iPods and video clips form their information world as they multitask their way to ineffective performance with even shorter attention spans. In a world of e-mails and text messaging, perhaps the art of deep thought and conversation is being displaced for quick and easy answers. Is this a generational shift or just a blip or hiccup? Certainly there are students who effectively use technology and I am certainly not a Luddite. I have seen how effective the Internet, e-mail and video and sound bite can be for teaching, but the basic tone of our students has seemed to change.

In the last 10 years, I've seen a sharp change in skills and attitude. For instance, 10 years ago about 40 percent of the class had used data tables in Excel before joining the program; now it's 10 percent. More and more students can't or won't read the syllabus, and I've taken to giving short quizzes each class period to get them to read the material before class begins. I believe that many students are passive in learning, expecting the lecture to imbue them with knowledge while providing them with entertainment. They seem to require constant feedback and attention more than usual. Modeling and analysis is a hard subject for many students, who seem more resistant than ever to hard work.

Education or Entertainment?

So how are we to recapture the initiative? Here are some of my thoughts about students and professors.

Students

Here are some contrasts that I keep addressing, which are certainly not true of all my students, but seem to be for a substantial growing minority.

1. Preparation vs. Attendance. It's an old saying about class: "Show up, on time, prepared." This seems to have been lost on many students, but is so basic and fundamental, I never thought I'd have to argue for this. Much

literature about Gen Y (a little younger than my students) says students think that they should get an "A" for just showing up. Seed that falls on unprepared soil does not have much chance to grow. Has the attitude of Gen Y started to permeate all of our society?

2. Analyzing vs. Regurgitation. Again, not a new revelation, and a constant battle for any educator is to get students to think, analyze, compare, contrast rather than just regurgitate facts or buzz words they don't understand. It is more of a battle today to get students to do the hard work of digging into a problem or case, to look at it from different angles, and really analyze.

3. Reflection vs. Reacting. Where there is lack of preparation and analysis, and there is a need for participation in the classroom, students tend to react rather than reflect. It's not that they lack the intelligence, but they don't take the time to think things through. Trying to balance work, family and school has always been difficult, but students used to be able to focus, individually and as a group, to read, study and reflect more than I see now. Reflection requires time—first to read, then think, discuss with others, and finally come to class ready to engage.

4. Awareness vs. Self-absorption. Certainly this is an age where it is easy to become self-absorbed—from wearing iPod ear phones, clerks talking to you while on their cell phones, distracted driving on cell phones, and hours spent playing video games. But there is a need for awareness (not just self-awareness) as well as an awareness of others. I'll swear that just rude public behavior has risen dramatically in the last years—people seem to have no "elevator manners" anymore (always in a rush to get off before others get on). Is this symptomatic of what we find (or don't find) in the classroom?

Perhaps these are not all new contrasts, but they may need to be addressed more directly these days as we think about how we present our material in the classroom.

Professors

I wish all the blame on the current situation could be placed on students, society and our banishment by the AACSB, but a large part still lies within us and is within our control to change. And my suggestions are still basically the same.

1. Update it: We must teach problem finding, solving and analyzing—not math appreciation and algorithms with endless manipulations. Many of us need to learn to model on spreadsheets and use the Solver to update our skills. I have difficulty finding adjunct faculty with industry and teaching experience that can use the Solver and spreadsheets. The AACSB is currently holding programs to produce professionally qualified (PQ) faculty, and the latest class of 21 contains no one in the decision sciences. This type of teaching is not easy, and there are so many things that can go wrong during class, not only on your machine but the students' machines as well. Microsoft has now thrown a monkey wrench into this whole affair by unleashing Vista and Office 2007 with no compatibility of menus, so that for the next five years or so, many students will not be in sync with each other and the professor.

2. Own it: Make the material your own—don't just depend upon the collateral materials from publishers and show 100 slides per lecture. This is not a new problem, but I'm afraid that too many professors in our profession can only go through the mechanics of the material found in textbooks rather than actually "own it." Textbooks now have a huge DVD filled with so much material, that many professors just inundate the students yet have no sense of ownership of the material itself. I've observed enough faculty teaching to see this take place, and students can sense when a professor doesn't really know what they are teaching.

3. Experience it: Do consulting and pro bono work or at least immerse yourself in *Interfaces* and read *OR/MS Today* and other publications that continue to present accounts of successful modeling. The divide between theory and practice has to be healed, and students need to know that these tools are useful and powerful in business and industry.

4. Implement it: Problem solving is more than just finding the mathematical answer, but is a process that includes learning how to be persuasive in getting the client to implement the solution. It is teaching students how to make a managerial presentation, not just an analytical one (how I did it!). It is including the human elements of problem finding, solving, and implementation, not just the numbers. And most important of all, it is finding out what the numbers mean.

Conclusion

Rather than try to present a definitive analysis or solution, I hope the above perspective serves as a conversation starter for all of us as we think about the best ways to continue our efforts in presenting the decision sciences to our students.

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