Software Review
Virtual U®: A Simulation of University System Management

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As a student, I remember in the mid-1980's when in math class we all were amazed at the new game we got to play on our Apple II's, "Lemonade." To us, it was a game: specify a number of glasses of lemonade to make, at a sale price, watch the weather to see if it was sunny or rainy (this increased or lowered your sales), maybe spend some money on a sign for advertising, and, make more money than your lab partner as you played. Today I know that it was strategic planning in its simplest form. We were managing a system with a limited number of both inputs and outputs. The system wasn't closed, which allowed for some excitement every once in awhile.

Virtual U® is simulation software that allows the user to manage a virtual university or college. It is "Lemonade" at its most complex: a highly permeable system to be managed with multiple inputs, outputs and a wide variety of possible outcomes. Virtual U ® succeeds in capturing aspects of the complexities of simultaneously managing the day-to-day academic, fiscal, human resource and enrollment management operations of an institution of higher education while strategically planning for the future.

The simulation is terrifically complex, modeling six areas of university management very well: resource allocation and finance; academic operations; faculty roles and responsibilities; enrollment management; sponsored research; and physical plant activities. In running a variety of simulations with the software (urban research university, rural college, etc.) it appeared that all of the areas modeled were founded upon economic variables that measure success: keeping your virtual university in the black, and retaining your position as President.

In this way, Virtual U® is highly realistic. Fiscal decisions directly or indirectly impact everything else. In your role as President, you see how the small decisions you make can ripple across the campus in the years to come, even inadvertently.

What was most interesting to me, however, was to run simulations with my own goals, which were more educationally altruistic than keeping a university in the black or retaining my role as President. Even as I put my virtual institution into the red and "wrecked" the simulation, I learned about balancing the harsh fiscal reality of the real world with my ideals.

An excellent example of this is the area of enrollment management. When you start the game, you select from a menu of variables that define your institution: departments, selectivity, location, reputation, athletic program, doctoral student percentage, etc. These variables help determine your enrollment statistics once the simulation commences: your yield, total enrollment, etc. In this modeled area, you can impact the student population over time by deciding whether to give athletic scholarships, whether (or how much) to target scholarship for students, how much to allocate to each of these possibilities, and, what priority to give each. Decisions on these points ultimately alter the demographic makeup of the university.

A second area, and one which truly highlights the simulation's complexity in its modeling, is faculty roles and responsibilities. At the outset, you select the departments to be included in the university. Though frustrated at first that the designers limited the number of departments one can put into the simulation, once I was into the simulation my frustration quickly changed to

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thankfulness. It is in this area, faculty roles and responsibilities, that the software really shines. The modeling goes to a level of complexity that truly reflects the intricacies in managing faculty. Virtual U® shows individual faculty strengths, weaknesses, and time allocations, per individual faculty member and per department, in six sub-modules of the Academic Operations Module. In conjunction with the Faculty Hiring and Retention Module, the user can attempt to increase minority faculty percentages; make alterations in how faculty spend their time (research, teaching, out of class student contact, etc.); or attempt to adjust the numbers of Full, Associate, Assistant and Adjunct professors over time. However, beware, for if you increase one variable, say having faculty spend more time on sponsored research in an attempt to increase your prestige or funding streams, without lowering another, say their class load, your faculty morale rate will drop.

The simulation fell short only in modeling student life, which is a difficult task because so many variables describe a higher education institution's student population and its needs, such as a commuter versus a residential population; varying levels of cultural diversity; and traditional age or non-traditional age students. In Virtual U®, you select the type of institution and some student demographics at the simulation's outset, but the number and scope of these variables is logically limited. Another issue is determining qualifying outcomes and creating a realistic simulation over time. How do you measure success or failure within a student population? By increased diversity of the student body? By retention of star professors? By the best program in a field of study? There any many answers. The options alone would overwhelm a user of a software program that attempted to model these variables.

Overall, however, Virtual U® is a realistic simulation, an excellent tool for learning the complexities and limitations that those in senior administration must face day in and day out. The software illustrates how one small decision can, over time, have enormous consequences; or, how as a President you must balance the needs of multiple constituencies, the Board of Trustees, faculty, students, alumni, etc.; or, how in the role of securing and allocating resources and funding you can influence areas beyond the scope of your portfolio.

Virtual U® combines systems theory with fiscal management with faculty affairs with the politics of higher education in a manner that one never could in a classroom. The simulation allows you to truly learn via experimentation, whether that is succeeding at the outcomes pre-determined by the designers, or, failing at those but attempting to meet your own set of desired outcomes. Furthermore, it helps you understand the roles that senior administrators really have in higher educational institutions today, not the "fantasy roles" that many believe they have. And, like in real life, there aren't any cheat codes for Virtual U® (at least that I could find).

NOTE: Virtual U® was conceived and designed by Dr. William F. Massy, President of the Jackson Hole Higher Education Group and senior research fellow at Stanford University's National Center for Postsecondary Improvement, and Enlight Software, a leading simulation system software developer. Data for the model were provided by the Institute for Research on Higher Education at the University of Pennsylvania. Support was provided by the Alfred P. Sloan Foundation and the Spencer Foundation. For more information or to download a demo of Virtual U®, visit http://www.virtual-u.org.