



Teaching aids and academic benefits

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The benefits

The Dynamic Case Study Simulator - Management Enterprise Resource Planning (MERP™) - solution is available in an advanced version (the full package) for students and for faculty needs.

This advanced solution provides students with comprehensive learning solutions as well as advanced tools for the professor aimed at supporting academic and administrative needs.

1. Learning benefits to students:

- *Practical real world insights* – Better positioning students to compete in the job market and bringing academic business theory to life.
- *Combining operational management models with actual practice:* – Forecasting, inventory replenishment management, dispatch policy management, applied costing theory, and more.
- *Macro and micro understanding* – Viewing the big picture of a global organization, as well as coping with detailed operations management issues.
- *Uncertainty is the truest business reality* – MERP™ enables students to dictate the managerial policies for running a manufacturing company in the face of uncertainty, as in real business life.
- *Cause and effect thinking* – Students truly understand the effects of their operational management and collaborative business policies on their effective execution and business results.
- *Realistic dynamic decision making* – Based on daily events that affect the organizational outcomes. Students must choose which decisions to make and when, in parallel with the evolving KPI status.
- *Reinforced learning* – Unlimited practice runs, enabling testing, and retesting, either at the university or in free time at home. Students can log in and run scenarios repeatedly, always learning from mistakes and thus improving their business acumen.
- *Competition based on shared online results* – Students compete in random scenarios reflecting turbulent daily business life.

2. Academic benefits

- *Each simulator run is unique* – Good results can only be achieved through actual practice and learning. As each assignment has a specific student-creator user ID, other students' work cannot be replicated.
- *The fluctuated virtual world reality* – Practice of semi-complex, yet real operations management theory is provided.



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How to teach OM for IE and MBAs, using a dynamic practical simulation?

Although each academic institute and each professor has his own methods and techniques, it is a challenging mission to raise the level of learning by using a dynamic Serious Game.

The MERP™ Serious Game has been used in various ways. The following method is used mainly to enrich the student's experience with hands-on practice of the theory learnt in the course.

In this method, the following process takes place:

1. *The students learn the virtual organization* and the interface of decisions and information available. Learning is accomplished by reading the case study and the various self-learning tutorials, videos and information available in the student's portal.
2. *The students run the organization*, competing to achieve the best results. The students run various scenarios during the semester, as often as they wish. The results of learning-by-doing improve during the recurring practice as students implement the theory learnt in the dynamic real virtual world.
3. *The students upload their assignments' best results* runs to the server directly from within the simulator.
4. *The professor can access the list of assignments* uploaded by the students. The list recommends the students' grades accordingly.

Although it is not essential to introduce the virtual world serious game in the classroom, the professor might consider showing the students the videos and the various available learning tools. However, we can also provide a two-hour advanced introduction session, as a virtual classroom conference (i.e. using WebEx) for a low rate.

The MERP™ has been used in both traditional class courses as well as a challenging online learning experience as used at the Kelley School of Business (Indiana University), where students learn over the web. More details on how to teach online courses and method is described in the attached article: "Teaching OM for MBAs_GV" by Professor Vastag.

You may also see the detailed interview with Professor Vastag at the end of this document.

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The benefits of the advanced version using the full package solution

When a professor chooses to use the solution in a specific course, a closed-group environment is provided for the class. In addition to having advanced learning features for the students, the following are additional course add-ons:

- *The students compete on their achieved results* within a closed group of their course classmates, rather than with thousands of unknown students of various backgrounds from all over the world.
- *Faculty can access the work done by a student*, review and analyze decisions taken during a simulation, and grade the overall results. MERP™ provides recommendations to aid the instructor in determining students' final grades.
- *The student's assignment can be uploaded* conveniently to the server, yet the assignment's date can be set by the professor for any date, forcing the deadline for meeting the course requirements.
- *Faculty can access the statistics of the student's practice*, the total time spent, the number of trials and effective runs, and the scenarios actually practiced.
- *Increasing complexity through a variety of scenarios*. (See the following **DCSS™ scenarios suite** paragraph and Figure 1)
- *Scenarios are constantly changed*, so students cannot replay the same approach.

1. Advanced Version for Students:

The limited featured license is for **one** installation of the MERP™ program on **one** PC only. Practice time lasts for a total of up to four hours, or for a maximum of a three-month period, whichever is reached first.

By purchasing the advanced version with the full package, the following additional features are included:

- *Availability of the full scenario range* - as can be seen in the following chapter and figure 1
- *Additional 20 hours* - for practicing
- *Faster run of the simulation* - with a faster server as well as a 'simulation speed control fast mechanism' to accelerate the run.
- *A feature enabling the saving of previous runs* - which include the student's personal notes, for future retrieval and for learning from the student's past mistakes.
- *The ability to choose the student's best assignment run* - and to upload it for evaluation
- *A feature that allows students to save their initial policies* - for use in future runs.
- *Additional PC installation*

2. DCSS™ scenarios suite

MERP™ consists of a whole suite of differing scenarios covering practices of varying levels of complexity and scope. Focusing on individual departments (such as Production, Purchasing and more), different industrial business processes (Make-to-stock versus Make-to-order), and the fluctuation of customer orders and client contracts, allows the use of different management models for inventory purchasing and replenishment (e.g., Materials Resources Planning (MRP) or “Order-up to inventory with order level policy”).

These DCSS™ scenarios illustrate aspects of integrative IPOM and ERP and include:

(a) Department-focused DCSS™ scenarios

- *Production orientation (TSCProduction)*: This focuses on the shop floor where users manage a one-product, four-machine production line. The setup allows them to experience production efficiency with various random characteristics and the basic concepts of balancing a production line.
- *Purchasing orientation (TSCPurchasing)*: Here users have to contend with a stochastic demand for two raw materials (with limited shelf life) from one supplier to meet the material requirements of a single final product. The goal here is to make supply meet demand while keeping costs down.
- *Operations orientation (TSCOperations)*: This scenario combines production and purchasing through the manufacture of two final products. Users need to develop policies for dispatching, MRP scheduling, run frequencies and alignment between purchasing and shop floor needs.

(b) Organization focused DCSS™ scenarios (see figure 1)

- *Marketing-operations orientation (TSC)*: Marketing demand impact is added to the production and purchasing aspects. Users may change marketing policies to increase customer demand. The challenge is to obtain maximum profit without hurting the company's reputation. The scenario incorporates all the TSC Operations scope with additional marketing demand impact. Students may change marketing policies to increase customer demand. They are challenged to balance the whole organization value-chain resources aimed at increasing profit. The challenge is to obtain maximum profit without harming the company's reputation.
- *MRP orientation (TSCMRP)*: This scenario enables the user to switch from the “reorder point purchasing model” of the TSC scenario to the MRP inventory replenishment mechanism. It enables students to practice the mechanism, and to learn how to understand and gain control over the various fluctuating events that affect this sensitive mechanism.
- *ERP/MRP orientation (ERP/MRP)*: This is a real semi-complex environment with a fairly good integrative information system. The company sells three different products, based on four raw materials and produced by six different machines. It faces a highly uncertain market demand, with a big seasonal peak.

Function→	Production	Purchasing	Marketing	Customers Demand	Client Contracts	Complexity Level (1-3)
DCSS™ scenario:						
<i>The TSC Production</i>	✓			✓		1
<i>The TSC Purchasing</i>		✓		✓		1
<i>The TSC Operations</i>	✓	✓		✓		2
<i>The TSC</i>	✓	✓	✓	✓		2
<i>The TSC MRP</i>	✓	✓	✓	✓		2
<i>The ERP MRP</i>	✓	✓	✓	✓		3
<i>TS 100</i>	✓	✓	✓	✓	✓	3

Figure 1: DCSS™ scenarios suite

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Interview with Professor Vastag – his experience with teaching on-line MBA OM.

(Managing Director, Corvinus School of Management, Corvinus University of Budapest).

The Corvinus School of Management (CSM), a unit of the Corvinus University of Budapest, is responsible for English language part-time and full-time MBA and executive programs in the Faculty of Business Administration. Dr. Vastag also holds Visiting Professorships at the University of Groningen in the Netherlands), and at the Stuttgart Institute of Management and Technology in Germany. Prior to returning to his alma mater, Professor Vastag served a year as Professor and Area Coordinator of Operations and Supply Chain Management at the CEU Business School and spent 17 years in the United States on the faculties of top-ranked business schools: the Kelley School of Business at Indiana University), The Eli Broad Graduate School of Management

(Michigan State University, and the Kenan-Flagler Business School at the University of North Carolina at Chapel Hill. He spent the 2000/2001 academic year in Stuttgart, where he was Professor and Dean of Supply Chain Management Programs.

Experience with MERP™:

Since 2001, Professor Vastag has used MERP™, both in traditional and online settings, to teach the Operations and Supply Chain Management course for MBAs. Using MERP™, he taught about 500 students at the Stuttgart Institute of Management and Technology in Germany, the Kelley School of Business - Kelley Direct Online MBA Program at Indiana University in the USA, CEU Business School in Hungary and the Corvinus School of Management in Hungary.

Professor Vastag requires students of his course to use the MBE Simulations simulator and dedicates 35% of the final course grade for submitted simulator work.

Moshe Yerushalmy, CEO of MBE Simulations, interviewed Professor Vastag on his experience using the simulator as an integral part of his introductory Operations Management course.

Q: *How many students have you taught* using the MERP™ at Indiana University?

A: Overall in Indiana, close to 500 students.

Q: *What are the specific challenges* you face in terms of teaching Operations Management, from both student and professor perspectives and how has the MBE Simulator provided a solution?

A: *Very simple scenario raises many complicated interactions.* In real life there are many, many factors students must interact with. There are many potential problems and no prepared solutions to counter these. With the MBE Simulator software what at first appears to be a very simple scenario raises many complicated interactions that are not as straight-forward as the student first anticipates. Students have to understand and get an overview of the whole supply chain picture and that can be quite an overwhelming experience for most of them.

A challenge for both teachers and students can be related to pressure for top grades leading to an increasing problem with cheating. As a result much copying went on from current or past students. With more traditional case studies students can download the whole discussion, how it was led and managed. To try and prevent this professors had to regularly change and update teaching materials very rapidly. However, in the simulation these problems are eliminated because it takes far more effort to copy someone's notes than to learn by themselves while running the simulator. In addition the complexity of the scenario allows for the possibility of more than a single, certain solution, but instead enables an ongoing search for solutions.

The MBE Simulations tool addresses a wide variety of questions such as forecasting, inventory modeling, scheduling, purchasing questions, performance management-what and how do you want to measure? And what kind of action do you take? So it is in effect a very powerful tool in a small compact package.

Q: *Lets talk more about the challenges of teaching Operations Management*, beyond the importance of understanding the interrelation and interaction between many things, how does one practice theory?



A: *Learning with the simulator is ideal* because how can you illustrate an inventory modeling in any other way. In traditional case studies one paragraph describes the problem, which is basically a mathematical problem, and the students simply plug in the numbers and get the answer. In the simulator you can actually see through the graphs and through the mechanism itself what the impact of changing a parameter can have on other parameters (such as changing the order point or order quantity).

Other teaching topics that can be illustrated by the simulator are: Forecasting, master production scheduling, MRP, bill of material, rough-cut capacity planning, purchasing-choosing suppliers. Basically you can cover every topic any Operational Management course has.

Q: *How do you feel the simulator provided further support* for you as a professor of Operations Management?

A: *Grading assignments* is a tremendous task for the professor and takes much time and effort. The simulator has helped me enormously because it automates grades, particularly since about 35% of students final end-of-course grade is based on their simulator work. The simulator classifies the assignments and the submission so the professor doesn't have to go through all of them. Experience taught me I could trust the simulator grades and I used those simulator grades in the overall grading of the students.

The simulator provides the professor with an objective measure that measures the students' ability to assimilate the material learnt into their real-life practice.

Whether the assignment is submitted face-to-face, or on-line the professor can never be sure that the student was the one that prepared the assignment. Cheating is a growing problem in the US due to the increasing pressure for better grades assuring the best jobs. But the problem with cheating is that students learn nothing from it. The simulator provides a solution for that challenge, by providing an ongoing measurement of how much time each student has spent on the simulator. Furthermore, the professor can recreate the work done by the students and see exactly what path they took and what decisions they made. The best solution was found to be the "Executive Summary" of tactics and way of managing. This challenges students to describe how they managed – just like a real-life board of directors. In the class I ask students why they decided on each decision. This is a completely different level than a usual executive summary where only managerial slogans are used. Here the summary really touches insights, and is a good indicator of the extent to which the students understood the problem.

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How to contact MBE Simulations

The reader of this book is referred to the following link:

<http://www.mbe-sim.com/book>.

Those requiring more information or wishing to purchase the full package, may contact MBE Simulations Ltd. directly at book-info@mb-sim.com .

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