

Developments in Business Simulation and Experiential Learning, Volume 28, 2001
**CURRENT USE OF AGRIBUSINESS SIMULATION GAMES:
SURVEY RESULTS OF UNIVERSITY AGRIBUSINESS AND
AGRICULTURAL ECONOMICS PROGRAMS**

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No single, user-friendly, effective agribusiness simulation is in widespread use in the United States today. Four decades ago, in the 1960s, computerized business simulation games were first used in teaching a university agribusiness management class. Dahlgran (1987) reported that "Babb and Eisgruber wrote and used simulators for a grain elevator, a farm supply center, a farm marketing center and a supermarket" in the early 1960's. Updated versions of those games are still in use today.

This paper reports some of the basic data from a 1999-2000 survey of university agribusiness management and agricultural economics programs in the United States. This is the first known survey of those programs concerning the use of business simulations. The scope of this project was limited and focused on how extensively business simulations were used in training and teaching business skills in agricultural economics and agribusiness programs at the undergraduate and graduate level in universities in the United States. A more specific objective for this project was to identify the business simulations being used in agriculture economics and agribusiness BS, MS and/or Ph.D. programs at four-year universities. It has been left to future research to evaluate in more detail the use and efficacy of business simulations in agricultural economics and agribusiness courses.

THE SURVEY METHOD

The use of business simulations in collegiate schools of business has been fairly well documented. Most recently Faria (1998) surveyed business schools by contacting 383 deans in a random sample of 765 schools listed in the American Assembly of Collegiate Schools of Business (AACSB) 1996-1997 Membership Directory. The American Assembly of Collegiate Schools of Business changed its name, effective July 1997, to AACSB - The International Association for Management Education. Deans at 97.5% of the business schools said their faculty was using business simulations in courses.

To collect information on agricultural economics and agribusiness courses, surveys were mailed to the administrators of those programs where such courses would likely be taught. Those survey instruments asked for the names and contact information for instructors/faculty who might have used or currently used business simulations in

their courses. A second survey instrument was sent to all the instructors identified by respondents to the administrator survey. The instructors were asked to provide information on simulations used, the use and the effectiveness of those simulations, and some demographic information.

The survey project reported on here focused on the use of business simulations in collegiate schools and departments teaching agricultural economics and/or agribusiness management courses. The surveys were designed and implemented by O'Rourke and Mendes (2000) in 1999-2000. The following three publicly available lists were used to identify college deans and department chairs who might have agribusiness management or agricultural economics programs at their schools: (1) American Agricultural Economics Association (AAEA) 1999/2000 Directory & Handbook, (2) National Association of State Universities and Land-Grant Colleges (NASULGC) & American Association of State Colleges and Universities (AASCU) July 1999 Directory – Deans and Directors of Academic Programs in Schools and Colleges of Agriculture, Agriculture and Life Sciences, or Agriculture and Natural Resources, and (3) International Food and Agribusiness Management Association (IAMA) 1997 Membership Directory.

A first mailing surveyed 283 college deans and department/division chairs at 157 institutions or campuses selected from those directories. They were asked to identify faculty members who teach agribusiness and/or agricultural economics classes and who currently use business simulations in the classroom, or who may have used business simulations in the classroom in the past. A second mailing surveyed the faculty identified in the first mailing. That list contained 163 faculty names from 71 colleges/universities programs in the United States, four from Canada, and one from Puerto Rico. They were agribusiness/agriculture economic faculty who currently teach agricultural economics or agribusiness classes and who currently used, had used, or were interested in using business simulations in those classes.

The results of the survey of college deans and department chairs are reported in Table 1. Out of the 157 agribusiness programs surveyed, 76 (48.5%) returned the instructor identification form, identifying 163 faculty who currently used, had used, or were interested in using

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business simulations in their classes. Ten programs indicated they did not have agribusiness/agricultural economics classes in their program. Six indicated their faculty were not using, or were not interested in using

business simulations as part of their classes, or were not interested in participating in the survey. Three letters were returned as undeliverable, and 62 (39.5%) of the programs did not respond.

Table 1: Responses to Survey of College Deans and Department Chairs.

	NUMBER OF SURVEYS	NUMBER OF INSTITUTIONS
Surveys mailed	283	157
Returned instructors names	76	76
Returned: No agribus. or agecon. program	10	10
Returned: No faculty use simulations	6	6
Returned: Undeliverable	3	3
No response	188	62

The second mailing was sent to the 163 faculty at the 76 institutions, identified from the responses to the survey of administrators. Eighty-eight returned the questionnaire, representing 66 institutions. Sixty-three institutions were U.S. agribusiness/agricultural economics programs and three were Canadian programs. Out of the 88 responses, 54 responded as current business simulation users, and 34 responded as not currently using business simulations. It is tempting to draw conclusions from these data regarding the

extent to which business simulations are used in agricultural economics and agribusiness programs. However, the protocol in this study will not support drawing such conclusions. However, it does seem that the use of simulations in such programs may be less ubiquitous than it has been shown to be in business schools. The response rates for the survey of instructors are presented in Table 2.

Table 2: Responses to Survey of Instructors Identified from Survey of Administrators.

	NUMBER OF INSTRUCTORS	NUMBER OF INSTITUTIONS
Surveys mailed	163	76
Surveys returned	88	66
Using simulations	54	41
Not using simulations	34	30
Surveys not returned	75	10

SIMULATIONS BEING USED

Fifty-four respondents reported using simulations in 80 courses in over 39 agribusiness or agriculture economics programs. Classes varied in size from 10 to 360 students, with a mean of 55.4 students per class, and a median of 35 students per class. Classes of 60 students or less represent 80% of the surveyed classes. The first set of specific questions was designed to gather technical details and instructor evaluations of the simulations they were using. The results demonstrated that many instructors or their institutions were developing their own simulations. A total of 34 courses, 43 percent of the 80 courses using simulations, were reported using simulations developed in-house (see Table 9). Those in-house simulations had 28 different titles.

A total of 43 courses, 54 percent of the 80 courses using simulations, were reported using simulations that had been purchased or purchased and altered in-house (see

Table 9). There were a total of 31 simulation titles reported in the purchased category. The title mentioned most often was the Purdue Farm Supply Center Simulation, which was reported, being used in six courses. The next most often mentioned title was HedgeSim, an agricultural commodity hedging simulator. Most simulations were reported to be PC based with approximately 25 percent using network systems and 20 percent using the Internet.

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BUSINESS SIMULATIONS IMPACT

General questions were developed to assess the overall perception of respondents as to what influenced their decision to adopt simulations and what were the advantages and disadvantages of using simulations. Respondents who used business simulations were asked what they considered to be the impact of using business simulations on student learning and retention of knowledge. They were also asked what they considered to be the impact of using business simulations on the workloads of both student and faculty.

Fifty-two of the fifty-four responding as users of business simulations gave useable responses to those questions that are summarized in Table 3.

The great majority of the business simulation user respondents believed that use of business simulations in their classes increased student learning (90%) and student retention of knowledge (85%). Also, seventy-three percent (73%) of the business simulation user respondents believed that adoption of business simulations would increase the workload of the instructor and sixty-five percent (65%) believed it would increase the workload of the student.

Table 3: Responses of instructors who reported using business simulations to: "Based on Your Experience and Judgment, the Adoption of Simulations Causes..."

ITEM	DECREASE	INCREASE	STAY THE SAME	DON'T KNOW
Student learning to?	0	47	3	2
Student retention of knowledge to?	0	44	3	5
Workload of the instructor to?	1	38	13	0
Workload of the student to?	3	33	16	0

INFLUENCED ADOPTION OF BUSINESS SIMULATIONS

Respondents were asked to rate several factors that may have influenced their adoption of business simulations for their classes regarding the extent to which those factors influenced their adoption decision. Respondents' own interest in improving instruction and respondents' own interest in business simulations were the most important

influences in adopting business simulations. On a scale of 1 to 6 with 1 representing a *very likely* influence and 6 a *not likely at all* influence, about 85 percent of respondents indicated that the desire to improve instruction was an influential factor at the 1 or 2 level. Sixty-three percent of respondents gave their own interest in business simulations similar influence ratings. Table 4 displays a summary of the results for the question of influential factors for adoption of simulations.

Table 4: Responses of instructors who reported using business simulations to: "The degree to which each item influenced your decision to adopt the simulation."

ITEM	MEAN	DEGREE OF LIKELIHOOD					
		VERY LIKELY	1	2	3	4	5
My own interest in business simulations:	2.39	24	10	5	8	4	3
My own interest in improving instruction:	1.72	36	10	2	0	1	4
Another professor influenced my decision:	4.28	5	9	7	2	7	24
Competing university influenced my decision:	5.11	4	1	4	3	6	36
Student employees influenced my decision:	5.55	3	1	0	0	5	44
Extension personnel influenced my decision:	5.06	6	2	3	0	4	39
Research reports influenced my decision:	4.54	7	6	3	4	3	31

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BUSINESS SIMULATIONS ADVANTAGES AND DISADVANTAGES

Business simulation user respondents were asked to rank a set of potential advantages associated with choosing and using business simulations in their classes. The major business simulation advantages identified by respondents, ranked one or two out of a list of six, were improved student motivation (54 percent of respondents), increased realism (63 percent of respondents), and

improved student decision-making skills (58 percent of respondents).

To sharpen interpersonal skills (19 percent of respondents) and to provide experience in dealing with risks in business (27 percent of respondents) were not considered as important. Using simulations were not considered valuable in leveraging instructors' time (four percent ranked 1 or 2). The summary of the advantages identified by respondents is presented in Table 5.

Table 5: Responses of instructors who reported using business simulations to: "Rank the following *advantages* in order of importance to you when choosing to use a business simulation."

Advantages of using business simulations	MOST IMPORTANT			LEAST IMPORTANT		
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>
Improve student motivation	18	10	11	7	5	1
Increases realism	12	20	9	4	4	2
Improve decision-making skills	14	16	12	8	2	0
Leverage instructor time	1	1	3	6	7	28
Sharpen interpersonal/communication skills (group work, etc)	4	5	5	8	17	9
Provide experience in dealing with risks in business	8	6	9	16	10	3

Business simulation user respondents were asked to rank a set of potential disadvantages associated with choosing and using business simulations in their classes. The major business simulation disadvantages identified by respondents, ranked one or two out of the list of five, were updating and maintaining the software (69 percent of respondents) followed by simulation use competing with

other activities for time (51 percent of respondents). Students not having the adequate background, and evaluating students' performance were also identified as problems when using business simulations by a smaller percentage of respondents. A summary of the set of potential disadvantages as ranked by respondents is listed in Table 6.

Table 6: Responses of instructors who reported using business simulations to: "Rank the following *problems (disadvantages)* associated with using business simulations."

Disadvantages of using business simulators	WORST RANK				NOT A PROBLEM
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	
Updating and maintaining the software	18	13	3	8	3
Students not having adequate background	9	11	11	12	1
Competing for time with other activities	13	11	14	8	1
Evaluating student's performance	6	11	15	11	3
Other	2		1		1

OPEN ENDED QUESTIONS

In the open-ended questions, respondents were asked what they would like a business simulation to do, and how simulations could better meet their teaching needs. The authors carefully categorized the open-ended responses and a summary of the most frequent responses on those two points is presented in Table 7. The most common response

regarding what the respondents would *most like a business simulation to do* was in the category of being realistic and simulating real business decisions.

The next most common response regarding what the respondents would *most like a business simulation to do* was being able to apply knowledge and skills in the business simulation. The results may indicate that instructors want business simulations to be as realistic as

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possible, so simulations could be used in classes to motivate students. reinforce the lecture materials, with the advantage of

Table 7: Responses of instructors who reported using business simulations to:

"WHAT WOULD YOU MOST LIKE A BUSINESS SIMULATION TO DO?"	OCCURRENCES
Be as realistic as possible/ simulate real business decisions problems	15
Be able to apply course knowledge and tools to business simulations	11
Be more dynamic, provide interactivity, and motivate students	5
"HOW SIMULATIONS COULD BETTER MEET YOUR NEEDS?"	OCCURRENCES
Be more user friendly, technological current and easy to update	14
Utilize the internet	7

The most common response regarding what the respondents think *how simulations could better meet your needs* was in the category of being more user friendly which included being technically current and easy to update. A broad category that included those responses that one would relate to a modern business simulation.

Taking advantage of the power and usefulness of the Internet was another attribute the respondents would like to see in simulations. The use of current data easily acquired from the Internet and inserted in the simulation was another improvement that participants suggested in their responses.

Table 8 contains a listing of the course titles and simulation titles reported by the instructors responding to the survey. They are organized alphabetically within the categories of developed in-house (In), purchased (P) or a mix (M), purchased and some in-house development. Future studies will be necessary to identify more details on the many simulations in use in agricultural economics and agribusiness management programs. The titles in Table 8 clearly indicate that there are a large number of simulations in use in those programs and that a large number of them have been developed in-house. No single simulation has a dominant position in the agricultural economics and agribusiness management programs in the United States.

Table 8: List of All Simulations Respondents Reported Using in Classes. Organized alphabetically within the following categories: Developed In-house (In), Purchased (P) or a Mix (M), purchased and some in-house development.

	Course Title	Simulation Name
In	Introduction to Agribusiness	Agri-Stocks
In	Financial Analysis	Bank Sim
In	Agriculture Markets and Prices	Broker
In	Food Product Development	Case-Based Reasoning
In	Production Economics	Cropping Optimizer
In	Agribusiness Accounting	Customized Sim
In	Agribusiness Selling	Customized Sim
In	Agribusiness Management	Customized Sim
In	Math Econ I	Decision Support Tools
In	Introduction to Agricultural Economics	Demand Elicitation
In	Futures & Options	Development of Marketing Management Plan
In	Introduction to Agricultural Economics	Double-Oral Auction
In	Farm Planning & Management	Farm
In	Farm Management	Farm Game
In	Farm Management	Farm Management Simulation
In	Farm Business Management	Farmsim
In	Packer-Feeder	Fed Cattle Market Simulator
In	Price Analysis	Fed Cattle Market Simulator

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In	Agriculture Price Analysis	Fed Cattle Market Simulator
In	Problems	Fed Cattle Market Simulator
In	Futures Trading Game	Futures Trading Game
In	International Sales & Merchandising	Global Grocery/ Retail Challenges
In	Agribusiness Management	Management Game
In	Introduction to Agricultural Economics	Posted Offer
In	Farm Management	Risk & Leverage (Excel spreadsheet)
In	Introduction to Exp. Economics	Smart Water Market System
In	Pub. Fin & Pub Pol.	Smart Water Market System
In	Financing Agribusiness	Spreadsheet Cashflows
In	Agribusiness Strategy	Strategy Games (C/B)
In	Food Product Development	Team Project Problem Based Learning
In	Agribusiness Management	The Management Game
In	Economics of Futures Markets	Trading Simulation
In	Math Programming	Various LP Models
In	Experimental Economics	Water Markets
P	Agribusiness Management	
P	Food & Fiber Marketing	1970's Cornell - Futures Speculation
P	Introduction of Agriculture Economics	AECON (Economic Models)
P	Farm Management	AgVenture
P	Farm Management	AgVenture
P	Agricultural Management	Alternative Farm Planning/Budgeting
P	Experimental Economics	Asset Markets
P	Agribusiness Management	Biz Wiz (a board game)
P	Experimental Economics	Double Auctions
P	Economics of Agricultural Markets	Electronic Market Place
P	Commodity Futures	Electronic Market Place
P	Agribusiness Finance	Farm Business Analysis
P	Experimental Economics	FCC Spectrum License Auction
P	Farm Management	FINPACK
P	Advanced Farm Management	FINPACK
P	Futures & Options	Futures & Options
P	Futures +Options Markets	Futures Trading Game
P	Futures + Options	HedgeSim 3.0.1
P	Futures + Options	HedgeSim 3.0.1
P	Commodity Marketing Simulation	HedgeSim 3.0.1 Y2K
P	Organization Management	Manager: A Simulation
P	Agribusiness Management	Purdue Farm Supply Center
P	Agribusiness Management	Purdue Farm Supply Center Simulation
P	Agribusiness Management	Purdue Farm Supply Game
P	Agribusiness Management	Purdue Farm Supply Management Game
P	Food & Agribusiness Management	Purdue Farm Supply Simulation Game
P	Introduction to Agribusiness Management	Purdue Farm Supply Store
P	Statistics	SAS (Proc Simnlin)
P	Agribusiness Management	Supermarket Management
P	Agribusiness Management	Supermarket University (Babb)
P	Strategic Analysis	Supermarket University (Babb)

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P	Cont. Issues in Agribus. Mgmt (Capstone)	The Business Strategy Game: A Global Industry Sim
P	Applied Strategic Management	The Business Strategy Game: A Global Industry Sim.
P	Economics of Agribusiness	The Global Business Game
P	Business Marketing	The Marketing Game
P	Agribusiness Management	The Strategic Management Game
P	Strategic Management Agribusiness	Threshold Competitor
P	Agriculture Business	Threshold Entrepreneur
P	Agribusiness	TradeSim
M	Managing Risk	@Risk Simulations
M	Advance Farm Management	AdSim
M	Agribusiness Management	Company Policy Manual Negotiation
M	Agribusiness Management	Purdue Grain Elevator Farm Supply Simulation
	Agribusiness Management	Case Studies
	Agribusiness Marketing	Case Studies
	Business Training	TABS

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