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Using a Computer Simulation Game to Teach Agri-Business Management

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Using a Computer Simulation Game to Teach Agri-Business Management

Abstract

A computer simulation game is used to teach agri-business management to undergraduate students, agri-business managers, and agricultural lenders. A hypothetical farm supply store is used to teach cash flow budgeting, breakeven analysis, and profitability analysis. Evaluations from both undergraduate students and Extension clientele praise the benefits received from active decision-making, competition, and working as a team to facilitate sharing ideas and experiences.

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Introduction

A computer simulation game is used to teach agri-business management to undergraduate students, agri-business managers, and agricultural lenders. The Purdue Farm Supply Game (Akridge, Erickson, & Babb) is an effective way to teach agri-business management tools, including:

- Cash flow budgeting,
- Breakeven analysis, and
- Profitability analysis.

The model provides enough business activity to illustrate the teaching points, while avoiding the trap of being so complex it overwhelms students and Extension clientele.

Purdue Farm Supply Game

The model represents a hypothetical farm supply store that sells four products:

- Complete feed,
- Concentrate feed,
- Commercial grade fertilizer, and
- Custom blend fertilizer.

The game is played a total of six quarters and decisions are made each quarter. Participants are divided into teams of four, and each participant chooses one of four available jobs:

- General manager,
- Inventory manager,
- Labor manager, and
- Cash manager.

Up to six stores compete in a rural market. Normally, three are used with undergraduate students. The number of stores is dictated by the number of participants when used with Extension audiences. All teams begin the game with identical balance sheets, and all earnings remain in the firm as retained earnings.

After each decision, students receive four reports:

- Income statement,
- Balance sheet,
- Cash flow statement, and
- Market share report.

They can then assess their results and prepare to make the next decision.

Cash Flow Budget

Participants prepare a projected cash flow budget as one of three written assignments. This requires them to project sales and expenses, as well as make several management decisions, such as:

- Change credit policies,
- Purchase storage facilities and/or trucks,
- Make extra payments on loans, and
- Contribute to savings.

Because sales vary from quarter to quarter, it is essential that participants accurately project cash inflows and outflows. Otherwise, a firm can end the quarter with excess cash or an emergency loan, which is charged an interest rate of 18%.

The importance of cash flow management is clearly illustrated to participants, because a failure to accurately prepare a projected cash flow budget becomes apparent with the next printout. Teams with an adverse cash position must then determine how they will rectify the situation. Consequently, participants are convinced of the usefulness of a projected cash flow budget through experience rather than by a lecture.

Breakeven Analysis

The income statement provided each quarter reports not only total amounts of revenues and costs for both the quarter and previous 12 months, but also reports revenues and costs on a per ton basis and as a proportion of sales. For the second written assignment, students classify costs into variable and fixed, and calculate breakeven in number of tons and total sales.

Next, students calculate the breakeven amount when considering changes in fixed costs (e.g., purchase of a storage facility, purchase of a truck, or increasing the loan amount), variable costs, and selling price of a product. Participants are often amazed at the impact of decreasing the selling price of a product. Additional sales needed to breakeven are usually much greater than expected. Again, participants are convinced through experience rather than by a lecture.

Profitability Analysis

Students evaluate management performance as their third written assignment, using the profitability linkage model. The model is a technique used to conduct a comprehensive profitability analysis. It illustrates the interrelationships that exist among three financial ratios:

- Return on sales,
- Asset turnover, and
- Financial leverage (total assets divided by owner's equity).

When multiplied together, the result is rate-of-return-on-equity.

This model is completed at the beginning of the game for October-December and then again 1 year later for October-December. The results are compared, and students must determine whether the profitability has improved or deteriorated during the past year. In either situation, students must provide at least three reasons for the resulting performance.

Also, comparative data are provided for previous classes. The results are sorted by rate-of-return-on-equity into high-profit and low-profit groups. Participants can easily see the impact of having better or worse financial ratios, such as:

- Gross margin,
- Operating expenses,
- Interest expense,
- Return on sales,
- Asset turnover, and
- Financial leverage.

They then have two remaining quarters before the game ends and the winner is determined. So their efforts are focused on areas they determine as weaknesses.

Grading and Evaluation

Quarterly printouts for undergraduate students are graded by evaluating performance in the following areas:

- Cash,
- Emergency loan,
- Unfilled orders,
- Inventory, and
- Labor utilization.

Team results are compared to criteria provided before the start of the game. Points are deducted when the results fall outside an acceptable range. Feedback is provided to Extension clientele using the same criteria.

At the conclusion of the six quarters, the undergraduate student team with the greatest owner's equity receives a 20 out of 20 quiz score, second place receives 18 out of 20, and third place receives 16 out of 20. Individuals on winning teams for Extension audiences receive a prize.

Closing Comments

The Purdue Farm Supply Game provides a simple, but effective technique for teaching agri-business management tools in a dynamic and competitive environment. Evaluations from both undergraduate students and Extension clientele praise the benefits received from active decision-making, competition, and working as a team to facilitate sharing ideas and experiences. To receive a copy of the manual or to order a copy of the program, contact the author.

References

Akridge, Jay, Steven P. Erickson, and E. M. Babb. *Purdue farm supply business management game manual*. Purdue Research Foundation. West Lafayette, IN: 1992.

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