Teaching and Educational Methods

Extending the Classroom: An Intercollegiate Strategic Management Simulation for Agribusiness Courses

Andrea Leschewski[a] and R. Brent Ross[b]
[a]*South Dakota State*, [b]*Michigan State University*

JEL Codes: A22, Q13, M10
Keywords: agribusiness, digital game-based learning, intercollegiate competition, motivation, simulation, strategic management

Abstract
This paper describes and analyzes an innovative intercollegiate strategic agribusiness management simulation designed to amplify the benefits of digital game-based learning (DGBL). Utilizing the Capsim Capstone 2.0 software, the project details the application and structure of competition between undergraduate teams at Michigan State University and South Dakota State University. Analysis of student survey feedback confirms that the intercollegiate format increased student interest and motivation in the simulation project. While intercollegiate competition was supported, students identified key challenges, including limited interuniversity communication, knowledge disparities due to varying course levels, and increased simulation complexity. Based on these insights, practical recommendations and lessons learned are offered for future applications, including facilitating interuniversity communication through virtual platforms and structured meetings, promoting partnerships between courses with similar student profiles, and optimizing simulation settings for clarity. This project demonstrates the strong potential of intercollegiate competition in enhancing DGBL within agricultural and applied economics courses.

1 Introduction

Digital game-based learning (DGBL) is a common pedagogical approach used in agricultural and applied economics courses to promote student motivation, engagement, and enhanced learning outcomes. Defined as the use of digital games and gaming environments to serve educational purposes, DGBL has been used in these disciplines since the 1960s (Prensky 2001; Porter et al. 2004). A widely adopted form of DGBL in this context is simulations, or electronic representations of real phenomena acting as practice for tasks in the real world (Lamb et al. 2018). Simulations find diverse applications within agricultural and applied economics, encompassing areas such as production agriculture, agribusiness management, and agricultural finance (Dobbins et al. 1995; Briggeman et al. 2012; Riley 2020; Bhattari and Davis 2024).

Extensive literature evaluates the impact of DGBL with systematic reviews and meta-analyses in the broader literature, indicating that DGBL leads to improved student learning outcomes (Connolly et al. 2012; Clark et al. 2016). Specifically, within agricultural economics and economics courses, the literature provides evidence that simulations and other forms of DGBL contribute to improvements in meeting course learning outcomes, higher test scores, and higher student evaluation scores (Blank 1985; Porter et al. 2004; Briggeman et al. 2012; Riley 2020). One means through which DGBL impacts learning outcomes is by fostering student motivation (Dobbins et al. 1995; Sailer et al. 2017; Subhash and Cudney 2018; Faisal et al. 2022). Within simulations, students report being motivated by peer learning, cooperation, social interaction, and the presence of a challenge (Chang et al. 2010; Hainey et al. 2011; Hess and Gunter 2013).

The influence of DGBL on student motivation and learning outcomes is not uniform; it is often shaped by moderating factors such as student characteristics, game design, and instructional methods. A key game characteristic for simulations is competition. Incorporating a competitive element into a simulation can generate social pressure, which in turn can boost student motivation and lead to improved learning outcomes (Chen et al. 2020; Sailer and Homner 2020; Wang and Huang 2023; Qiao et al. 2024). Competition can, however, have a negative effect on learning outcomes if it results in rivalry that leads to feelings of irrelevance and oppression among some participants (Sailer and Homner 2020). Combining competition with collaboration helps mitigate these potential negative effects. Group-based competition, as opposed to individual competition, can create a positive learning environment that fosters knowledge development (Xu and Yang 2010; Sailer and Homner 2020).

Beyond intra-classroom dynamics, the scope of competition may also play a significant moderating role in DGBL's impact on motivation and learning. To further elevate student motivation and engagement, simulations have evolved to include intercollegiate competition, extending beyond individual classrooms to involve students from different universities. While literature on this specific area remains limited, Briggeman et al. (2012) detail implementation of an Agricultural Bank Simulation Game involving competition between student groups from Louisiana State University and Oklahoma State University. Pre- and post-simulation assessment scores suggest that the intercollegiate competition had a positive impact on student learning.

This paper describes an innovative intercollegiate strategic agribusiness management simulation designed to amplify the benefits of DGBL by extending competition beyond the traditional classroom setting. This project engages students in undergraduate agribusiness management and strategy courses, utilizing Capsim Capstone 2.0 software to simulate real-world business scenarios. Students are organized into groups that manage virtual companies, making strategic decisions across core business functions while directly competing against groups from both their own course and a course at a different university. Specific study objectives include (1) describing the structure and design of the intercollegiate strategic agribusiness management simulation project, (2) detailing the application of the project in food and agribusiness management courses at Michigan State University (MSU) and South Dakota State University (SDSU), (3) analyzing student feedback from a post-project survey to determine whether the intercollegiate competition increases student interest and motivation in the simulation project, and (4) providing practical recommendations and lessons learned for faculty interested in implementing this intercollegiate simulation in future agribusiness courses.

2 Simulation Project Structure

The intercollegiate simulation project presented in this paper utilizes Capsim Capstone 2.0, an established business strategy simulation, as its foundation. This section will first introduce the Capsim Capstone simulation and then detail its design and delivery specifically for both an agribusiness classroom and in an intercollegiate competitive environment. All assignments described are available in the online supplementary material.

2.1 Capsim Capstone Simulation

The Capsim Capstone simulation is a widely adopted business strategy simulation, having been used by nearly 2 million students to date (Capsim 2025). It is designed for use in undergraduate business and management courses to promote active learning and create a competitive environment that increases student motivation (Capsim 2025). Within the simulation, students assume the role of management teams for competing companies that produce sensors within a simulated industry.

Student teams make decisions across four core business functions: research and development (e.g., product reliability, size, and performance), marketing (e.g., product price, sales budget, promotion

budget, and sales forecast), production (e.g., plant production level, capacity, and automation), and finance (e.g., raising capital, debt management, and stock management). The simulation also offers optional decision-making modules for human resources management and total quality management. Each student company begins with five identical products that target five distinct market segments: low-end, traditional, performance, size, and high-end. Teams can opt to discontinue and develop new products throughout the simulation. The simulated industry is a closed system (i.e., there are no new entrants and companies cannot exit during the simulation period).

The simulation operates on a web-based platform, where students navigate various functional areas of their business in a spreadsheet format to make decisions. It is structured as a tournament in which student-run teams compete against each other, all starting from the same initial position. Each industry within the simulation consists of six student teams, with each team typically consisting of 4–6 students. The competition spans up to eight rounds, or simulated years. After each round, teams receive detailed simulation results and a balanced scorecard, allowing them to track their performance and make informed decisions for the subsequent rounds.

2.2 Design and Delivery

While the Capsim Capstone simulation is designed for intra-classroom competition, we collaborated with a representative at Capsim to configure the simulation to allow for intercollegiate competition. This adaptation enabled faculty members from multiple universities to jointly control the simulation and allowed each industry to include teams drawn from multiple universities.

The intercollegiate simulation project was introduced to students through a comprehensive in-class session and the Capsim tutorial. The in-class introduction provides students with an overview, specifically highlighting its intercollegiate nature to build excitement and motivation. Following this, students are tasked with completing the Capsim tutorial as homework. The tutorial guides students through the simulation's online interface, explaining decision-making across core business functions and familiarizing students with the performance reports generated after each round. Following this introduction, each team develops a management plan that outlines their company's mission and vision, goals and objectives, core strategy and team member roles and responsibilities.

Before the official competition, students engage in three practice rounds (four practice rounds are possible). These rounds allow students to familiarize themselves with the simulation interface and practice implementing their chosen strategies. After the practice rounds are completed, the simulation restarts for the actual competition. The core of the project involves eight simulation rounds, with each round corresponding to 1 year of operation. An in-class workday is provided for each round, allowing teams dedicated time to collaborate and make their management decisions, with decisions for each round due within 1 week.

An in-class debriefing session takes place after each round is processed. During these debriefs, the instructor leads students through an analysis of the decisions made, the resulting performance outcomes, and the lessons learned. A key focus of these sessions is to analyze the performance of teams from the competing university and formulate responsive competitive strategies. The project culminates in a debrief presentation from each group: Students present an overview of their initial strategy, assess their performance against their management plan and competitors, identify key management decisions that positively or negatively impacted their performance, outline future management decisions they would make if they were to continue operating their company, describe lessons learned about managing a company or team. At the end of the course, students also complete group evaluations through Capsim for each of their teammates to assess individual contributions and effort throughout the project.

3 Application

The intercollegiate simulation project was implemented in Fall 2023, involving students at South Dakota State University and Michigan State University. At SDSU, the project was integrated into *AGEC 371: Agricultural Business Management*, a course with 66 students comprised primarily of sophomores and juniors majoring in agribusiness, business economics, animal science, and agriculture science. This in-person course focuses on applying economic and business principles to agribusiness management, covering strategic planning, organizational structure, leadership, market analysis, marketing and pricing strategies, and control processes. At MSU, the project was incorporated into *AFRE 445: Strategic Management for Food and Agribusiness Firms*, a capstone course for 33 seniors majoring in agribusiness management, environmental economics and management, and food industry management. This course, also delivered in person, aims to equip students with principles and techniques for analyzing and implementing business and strategy, identifying and managing strategic problems, and applying these concepts to firms within the food and agribusiness industries, culminating in a capstone project.

Following completion of the project, students completed a survey on their experience with their project. The goal of the post-simulation project survey was to determine whether the intercollegiate simulation project increased student motivation and gather student feedback to improve the project for future applications. The survey included 7 Likert-style questions to gauge students' general satisfaction with the project, whether intra-classroom competition increased enjoyment and motivation, whether intercollegiate competition increased enjoyment and motivation, and whether future courses should include intercollegiate competition in the simulation project. The survey concluded with three written response questions asking students to identify the advantages and disadvantages of intercollegiate competition in the simulation project and how to increase interaction among students from different universities in the project. The SDSU deemed this study exempt on March 31, 2025.

4 Student Survey Results

Student responses to the Likert-style questions in the post-project survey are summarized in Table 1. Results suggest competition had a positive impact on student motivation, with 71 percent of students agreeing that self-competition increased their interest and motivation, followed by intra-class competition (64 percent) and intercollegiate competition (53 percent). The majority of students also enjoyed competing against their classmates (68 percent) and students from another university (58 percent). Very few students reported a negative experience with competition, with only 11 percent and 13 percent indicating they did not enjoy competing against their classmates and students from another university, respectively. Overall, 70 percent of students agreed that competitors from other universities should be included in future applications of the simulation project.

Table 1 also presents disaggregated student responses by university. When comparing results across universities, 79 percent of MSU students agreed that future applications of the simulation project should include competitors from other universities, compared to 63 percent of SDSU students, suggesting that while students at both universities supported the intercollegiate format, the MSU students were slightly more in favor of its continued use. Similarly, a greater share of MSU students (69 percent) indicated they enjoyed competing against students at another university compared to SDSU students (50 percent).

In the post-simulation project survey, students were also asked what advantages and disadvantages they experienced in playing the simulation with students from a different university (Table 2). Students identified three primary advantages of intercollegiate competition: rivalry/school pride, diverse perspectives, and increased motivation. Over half of the students (51 percent) noted that intercollegiate competition heightened rivalry and school pride, with one student commenting, "It instills a sense of school pride and makes kids work harder to beat the other university." Additionally, 38

percent of students appreciated the diverse perspectives offered through intercollegiate competition, as exemplified by a student who shared, "I think that it is interesting to be able to compare our performance against students that have different prior knowledge." Nearly a quarter of students (24 percent) also reported increased motivation, with one indicating, "I think it pushes students to work harder overall. It also puts positive pressure to perform better for your university."

Table 1. Summary of student responses to post-intercollegiate agribusiness management simulation project survey (*N* = 92)

	Michigan State University (*N* = 38)			South Dakota State University (*N* = 54)			All Students (N=92)		
	Disagree # (%)	Neutral # (%)	Agree # (%)	Disagree # (%)	Neutral # (%)	Agree # (%)	Disagree # (%)	Neutral # (%)	Agree # (%)
My company's performance influenced my interest and motivation in the simulation.	1 (3%)	4 (10%)	33 (87%)	7 (13%)	15 (28%)	32 (59%)	8 (9%)	19 (21%)	65 (71%)
Competing with my classmates increased my motivation and interest in the simulation.	0 (0%)	8 (21%)	30 (79%)	11 (20%)	14 (26%)	29 (54%)	11 (12%)	22 (24%)	59 (64%)
Competing against students outside of our university increased my motivation in the simulation.	2 (5%)	14 (37%)	22 (58%)	13 (24%)	14 (26%)	27 (50%)	15 (16%)	28 (30%)	49 (53%)
I enjoyed competing against my classmates in the simulation.	1 (3%)	4 (10%)	33 (87%)	6 (11%)	18 (33%)	30 (56%)	7 (8%)	22 (24%)	63 (68%)
I enjoyed competing against students at another university in the simulation.	2 (5%)	10 (26%)	26 (69%)	8 (15%)	19 (35%)	27 (50%)	10 (11%)	29 (32%)	53 (58%)
Future Capsim simulations in this course should include competitors from other universities.	3 (8%)	5 (13%)	30 (79%)	9 (17%)	11 (20%)	34 (63%)	12 (13%)	16 (17%)	64 (70%)

Notes: The percentage of students that selected each response is shown in parentheses.

Table 2. Summary of student identified advantages and disadvantages of intercollegiate competition in an agribusiness management simulation project (*N* = 92)

Question Posed	Major Themes	*N* (%)
What advantages do you see in playing the Capsim simulation with students from a different university?	Rivalry/school pride	47 (51%)
	Diverse perspectives	35 (38%)
	Increased motivation	22 (24%)
What disadvantages do you see in playing the Capsim simulation with students from a different university?	Lack of communication	26 (28%)
	Knowledge barriers/differences	10 (11%)
	Simulation complexity	10 (11%)

Notes: Themes are not mutually exclusive. *N* represents the number of students that noted each major theme in their question response. The percentage of students that identified each theme is shown in parentheses.

Identified disadvantages of intercollegiate competition included lack of communication, knowledge barriers and differences, and simulation complexity. The most frequently cited disadvantage was a lack of communication, with 28 percent of students indicating they would have liked increased interaction with their opponents at competing universities. Students shared that increased communication would allow them to better understand the simulation and course material, with one student stating that "disadvantages of competing with other universities is that we are not able to bounce ideas off each other. Since it seemed like they were doing well, we were not able to ask them for advice or pointers based on their success." Many students were also concerned that knowledge barriers gave their opponents an unfair advantage, with one response indicating "a disadvantage is, that the competition may not be fair in terms of education, practice, and different approaches. As well as, help from instructors or group members." Finally, students felt the addition of intercollegiate competition increased the complexity of the simulation, making it difficult to debrief results across numerous teams and industries and challenging to differentiate between teams from SDSU and MSU.

5 Lessons Learned and Recommendations

Reflecting on the implementation of the intercollegiate agribusiness management simulation project, this section presents lessons learned and recommendations for improving its future application. Overall, the addition of intercollegiate competition was well received by students at both universities. Post-implementation survey results support existing literature, suggesting that intra-class competition effectively increases student motivation within the simulation (Chen et al. 2020; Sailer and Homner 2020; Wang and Huang 2023; Qiao et al. 2024). Furthermore, the findings provide evidence that the scope of competition acts as a moderating factor influencing the simulation's impact on student motivation. The inclusion of intercollegiate competition fostered increased feelings of rivalry and school pride, consequently boosting student motivation to perform well in the simulation. Students were highly supportive of the intercollegiate competition, indicating that competition from students at other universities should be integrated into future applications of the simulation project.

While most students favored intercollegiate competition, some disadvantages were noted that should be addressed in future applications of the project. The most commonly raised disadvantage associated with the intercollegiate competition aspect of the simulation was limited communication among students at different universities. This limitation stemmed from differing class times at SDSU and MSU, making real-time communication challenging, and the absence of communication mechanisms within the Capsim Capstone simulation platform itself. To address this, we included a question on interaction in the post-project survey, and student suggestions (summarized in Table 3) highlight the need for shared virtual spaces, structured meeting points, and enhanced information sharing. Specifically, 11 percent of students suggested shared virtual spaces like discussion boards and group chats, while 25 percent recommended structured meeting points such as Zoom calls or recorded videos for introductory meetings, result debriefs, strategy discussions, and final debrief presentations. Future applications of the project should integrate shared virtual spaces and/or structured meeting points and potentially align course times across participating universities to foster better communication among students.

Table 3. Summary of student identified strategies to increase interaction among students from different universities in an agribusiness management simulation project (*N* = 92)

Question Posed	Major Themes	*N* (%)
Do you have any suggestions on how to increase interaction among students from different universities in the simulation?	Structured meetings	23 (25%)
	Information sharing	11 (12%)
	Shared virtual spaces	10 (11%)

Notes: Themes are not mutually exclusive. *N* represents the number of students that noted each major theme in their question response. The percentage of students that identified each theme is shown in parentheses.

Other disadvantages of intercollegiate competition noted by students include increased simulation complexity and knowledge barriers or differences among students from competing universities. Students noted knowledge barriers among competing universities as a key disadvantage of intercollegiate competition. These barriers likely stemmed from the differing student profiles and course objectives; the MSU course was a capstone strategic management class for seniors, while the SDSU course was an intermediate agribusiness management class for sophomores and juniors. This difference in preparation is reflected in the survey results, as a higher share of MSU students (69 percent) enjoyed competing against students at another university compared to SDSU students (50 percent). To mitigate this challenge, faculty adopting the intercollegiate simulation project should aim to partner with courses at other universities that have similar content and student profiles, especially in terms of majors and grade level. They can also minimize this challenge by emphasizing the similarities between the involved classes and students at the beginning of the semester to discourage students from attributing poor performance to knowledge barriers.

Regarding simulation complexity, students found it difficult to identify which university each team represented within the Capsim Capstone platform, and the large number of teams and industries made interpreting results more challenging. In future applications, it may be preferable to implement the intercollegiate simulation project in courses with lower enrollment (36 or fewer students across all courses) to allow all students to compete in the same industry and simplify results interpretation. Additionally, when setting up the Capsim Capstone simulation, future applications should work with their

Capsim representative to determine whether team names can be customized to clearly indicate which university students represent.

6 Conclusion

This paper introduces and highlights the implementation of an innovative intercollegiate agribusiness management simulation, demonstrating that extending competition beyond the classroom significantly enhances student motivation. Despite challenges related to communication barriers, varied student profiles, and simulation complexity, the overwhelmingly positive student feedback underscores the value of intercollegiate competition in DGBL. The findings offer practical recommendations for future applications of the intercollegiate simulation project, including fostering better interuniversity communication through shared virtual spaces and structured meetings, aligning course content and student demographics across participating institutions, and optimizing simulation setup to reduce complexity. By addressing these areas, future applications of the project can further leverage the benefits of intercollegiate competition, ultimately improving student learning and preparing students for a future career in agribusiness.

About the Authors: Andrea Leschewski (corresponding author; andrea.leschewski@sdstate.edu) is an Associate Professor of Applied Economics, Ness School of Management & Economics, South Dakota State University. R. Brent Ross (rross@msu.edu) is a Professor of Food and Agribusiness Management, Department of Agricultural, Food, and Resource Economics, Michigan State University.

Acknowledgments: This research was funded by USDA NIFA Hatch Project 7002300: “Mitigation of Food and Nutrition Insecurity: An Economic Evaluation of Food Assistance and Nutrition Education Policy.” Funders had no involvement or restrictions regarding publication. No conflicts of interest are reported by study authors. This study was deemed exempt by the South Dakota State University Institutional Review Board on March 31, 2025.

References

Bhattari, A., and G.C. Davis. 2024. "Teaching the Economics of Corporate Social Responsibility: A Mixed Motive Bargaining Simulation Game." *Applied Economics Teaching Resources* 6(4):69–80. https://doi.org/10.22004/ag.econ.348257

Blank, S.C. 1985. "Effectiveness of Role Playing, Case Studies, and Simulation Games in Teaching Agricultural Economics." *Western Journal of Agricultural Economics* 1:55–62. https://doi.org/10.22004/ag.econ.32523

Briggeman, B.C., J.D. Detre, N. Lansford, and D. Doye. 2012. "Experiential Learning on the Internet: A Case Study of the Internet Agricultural Bank Simulation Game." *NACTA Journal* 56(2):63–67. https://www.jstor.org/stable/nactajournal.56.2.63

Capsim. 2025. *The Capstone Business Simulation*. Available online: https://www.capsim.com/product-catalog/business-simulations [Accessed January 8, 2026]

Chang, Y.C., H.Y. Peng, and H.C. Chao. 2010. "Examining the Effects of Learning Motivation and of Course Design in an Instructional Simulation Game." *Interactive Learning Environments* 18(4):319–339. https://doi.org/10.1080/10494820802574270

Chen, C.H., C.C. Shih, and V. Law. 2020. "The Effects of Competition in Digital Game-Based Learning (DGBL): A Meta-Analysis." *Educational Technology Research and Development* 68(4):1855–1873. https://doi.org/10.1007/s11423-020-09794-1

Clark, D. B., E.E. Tanner-Smith, and S.S. Killingsworth. 2016. "Digital Games, Design, and Learning: A Systematic Review and Meta-Analysis." *Review of Educational Research* 86(1): 79–122. https://doi.org/10.3102/0034654315582065

Connolly, T. M., E.A. Boyle, E. MacArthur, T. Hainey, and J.M. Boyle. 2012. "A Systematic Literature Review of Empirical Evidence on Computer Games and Serious Games." *Computers & Education* 59(2):661–686. https://doi.org/10.1016/j.compedu.2012.03.004

Dobbins, C.L., M. Boehlje, S. Erickson, and R. Taylor. 1995. "Using Games to Teach Farm and Agribusiness Management." *Review of Agricultural Economics* 1:247–255. https://doi.org/10.2307/1349570

Faisal, N., M. Chadhar, A. Goriss-Hunter, and A. Stranieri. 2022. "Business Simulation Games in Higher Education: A Systematic Review of Empirical Research." *Human Behavior and Emerging Technologies* 2022(1):1–28. https://doi.org/10.1155/2022/1578791

Hainey, T., T.M. Connolly, M. Stansfield, and E.A. Boyle. 2011. "Evaluation of a Game to Teach Requirements Collection and Analysis in Software Engineering at Tertiary Education Level." *Computers & Education* 56(1):21–35. https://doi.org/10.1016/j.compedu.2010.09.008

Hess, T., and G. Gunter. 2013. "Serious Game-Based and Nongame-Based Online Courses: Learning Experiences and Outcomes." *British Journal of Educational Technology* 44(3):372–385. https://doi.org/10.1111/bjet.12024

Lamb, R.L., L. Annetta, J. Firestone, and E. Etopio. 2018. "A Meta-Analysis with Examination of Moderators of Student Cognition, Affect, and Learning Outcomes While Using Serious Educational Games, Serious Games, and Simulations." *Computers in Human Behavior* 80:158–167. https://doi.org/10.1016/j.chb.2017.10.040

Porter, T.S., T.M. Riley, and R.L. Ruffer. 2004. "A Review of the Use of Simulations in Teaching Economics." *Social Science Computer Review* 22(4):426–443. https://doi.org/10.1177/0894439304268464

Prensky, M. 2001. *Digital Game-Based Learning*. McGraw-Hill.

Qiao, S., S.S. Yeung, X.A. Shen, K.L. Leung, T.K. Ng, and S.K.W. Chu. 2024. "How Competitive, Cooperative, and Collaborative Gamification Impacts Student Learning and Engagement." *Language Learning & Technology* 28(1):1–19. https://doi.org/10.64152/10125/73546

Riley, J.M. 2020. "Hedging with Futures: An Experiential Learning Game." *Applied Economics Teaching Resources* 2(2):30–37. https://doi.org/10.22004/ag.econ.302619

Sailer, M., and L. Homner. 2020. "The Gamification of Learning: A Meta-analysis." *Educational Psychology Review* 32:77–112. https://doi.org/10.1007/s10648-019-09498-w

Subhash, S., and E.A. Cudney. 2018. "Gamified Learning in Higher Education: A Systematic Review of the Literature." *Computers in Human Behavior* 87:192–206. https://doi.org/10.1016/j.chb.2018.05.028

Wang, D.C., and Y.M. Huang. 2023. "Exploring the Influence of Competition and Collaboration on Learning Performance in Digital Game-Based Learning." *Educational Technology Research and Development* 71(4):1547. https://doi.org/10.1007/s11423-023-10247-8

Xu, Y., and Y. Yang. 2010. "Student Learning in Business Simulation: An Empirical Investigation." *Journal of Education for Business* 85(4):223–228. https://doi.org/10.1080/08832320903449469

DOI: https://doi.org/10.71162/aetr.554721