

SIMULATIONS FOR STRATEGY COURSES: MEASURING TEAMWORK

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ABSTRACT

Simulations are an important part of capstone strategy courses - they facilitate transfer of training by providing "learning-by-doing" opportunities to the students. They also allow instructors to provide authentic activities situated amidst relevant context, enable learners to grasp not just 'how' an activity must be done, but the 'why,' the 'what, and the 'with whom.' Simulations have become an accepted part of strategy classes both at the undergraduate and graduate levels. One area that has not been fully explored is the impact of teamwork on simulation results. Professors using simulations believe anecdotally what the literature on teamwork has suggested for decades: the quality of team processes is directly correlated to the quality of team results. However, detailed measurements are lacking. This paper uses a graduate strategy course as an exploratory study to see if there was a relationship between teamwork and team results. It then includes a just completed graduate course to provide additional data for this study which illustrates some of the complexity in evaluating team performance.

INTRODUCTION

Simulations are an important part of capstone strategy course. Edgar Dale (1969) illustrated this with his research when he developed the "Cone of Learning". This concept states that after two weeks we remember only 10% of what we read, but we remember 90% of what we do! Simulation-based training puts learning objectives into the context of a scenario which allow the learner to experience training as it relates to a life-like situation.

The best simulations are team based with each member having a specified role in the simulation – good simulations are too complex for just one person to play by himself. However, what is the relationship between teamwork and simulation results. Professors using simulations believe anecdotally what the literature on teamwork has suggested for decades - the quality of team processes is directly correlated to the quality of team results.

However, detailed measurements were lacking. It was difficult to turn anecdotes into evidence without administering complex research instruments – until now. Capsim, a leader in business simulations, has developed a new tool that will simplify the process of quantifying team dynamics and individual accountability within the team. Also, the results can be cross-referenced with overall team performance.

CAPSIM SIMULATION

One of the leading business simulations is offered by Capsim, Inc. The Capsim business simulation engages participants in a dynamic competition to turn struggling companies into suc-

cessful, profitable businesses. Classes are divided into teams that compete against each other by making strategy, finance, production, and marketing decisions that interact to grow their business. Instructors focus on using the simulation experience to reach defined learning goals.

With each round of decisions (each representing a full year for the company), participants build their business acumen and decision-making ability as they interpret data, shape strategies, and discuss the results. A wide variety of Capsim results, data, and services support the creation of a dynamic, highly interactive learning experience.

Delivered online, in the classroom, or a combination of both, and delivered in condensed or expanded time frames, Capsim simulations have the flexibility to adapt to many academic or corporate curriculum. Capsim simulations have been used extensively at more than 500 business schools and leading corporations in the US and around the world (Chasteen and Damonte, 2007).

BUSINESS EDUCATION

A capstone strategy class is usually one of the final courses taken for both undergraduate and graduate business programs. This course integrates all the material from previous classes such as marketing, accounting, and finance. Students draw on their awareness of various environmental influences (social and political) to solve business problems. Management alternatives are examined with an ethical perspective relating policy trends to the strategic planning mode (Chasteen, 2014).

The purpose of a capstone course is to integrate the learning achieved in individual business courses taken to earn a business degree. The knowledge acquired in finance, accounting, operations, MIS, marketing, and organizational behavior classes is utilized to study the strategic management of the firm as well as the responsibilities of the general manager. This is often accomplished with the extensive use of case studies. This model has proven effective and has been copied by business schools worldwide.

Another approach to integrate the learning achieved in individual business courses taken to earn a business degree is the use of simulations. Students participate in a simulation that requires taking into account multiple decision-making factors while balancing all sectors of the firm's environment. According to Dale (1969), an active learning method can provide even better results. Therefore, simulations have become a standard part of many US undergraduate and graduate capstone strategy courses. They are also becoming common in strategy courses in many other countries.

THE NEED FOR TEAMWORK SKILLS

The use and need for teams is well documented in contem-

porary firms for a variety of purposes and across a variety of industries. Today’s technology is just too complex for employees to work entirely on their own. Good business simulations have followed this general approach. Simulations require students to apply functional business knowledge while performing in a team-based context, i.e., making decisions about business strategy and operations as members of a top management team (Anderson and Coffey, 2004).

Like all performance in team settings, success in simulations requires accomplishing operational and technical tasks while engaging in coordination, cooperation, and adaptive actions in order to make effective decisions. Both “task work” and “team work” are necessary. Task work can be defined as operational decisions required to run a company. Team work can be defined as interpersonal interactions required to reach decisions.

One important issue is how to accurately measure task work and team work. Simulations simplify measuring “task work” – one year of operation can be simulated by processing one set of decisions. The results show how successful the company was with respect to sales, profits, stock price, etc. (Capsim Users Guide, 2012).

Accurately measuring “team work” has traditionally been harder – how does the faculty really know the contribution of each team member. One tool that has been used is peer evaluations, but traditional peer evaluations have had problems as discussed later in this paper. The main issue is that students usually don’t like to give bad ratings to their team members even when those members are not doing their fair share (Lam and Shau-broeck, 2000).

PEER EVALUATIONS

Peer evaluations are a vital tool for measuring performance in team based activities. Capsim has used peer evaluations in its business simulations for more than a decade. Capsim’s new peer evaluation, launched in 2012, is a more sophisticated and refined instrument. Capsim created the new peer evaluation after a thorough analysis of thirty years of literature on team

dynamics (Capsim, 2012).

Peer evaluations are a crucial measurement tool in team based activities where the goal is:

- To promote individual level accountability,
- To assess individual engagement with and contribution to the team
- To measure individual performance in the team.

Capsim’s new peer evaluation allows:

- Improved ability to evaluate individual contribution to a team
- Closer oversight and measurement of team processes
- Questions and a roadmap for team development

PURPOSE AND RESEARCH QUESTIONS

The purpose of this study was to examine if student success in the simulation was related to the quality of the team work. This study used a graduate strategy course at a US university as an exploratory study. The topics covered in the course were traditional class lectures, exams, case discussions, and a business simulation. The simulation exercise was implemented with a web based simulation game. The simulation lasted eight rounds (eight years) and was scored by using the Balanced Scorecard (BSC).

The following research question was addressed: “Is there a relationship between the scoring by a team with the quality of team work for that team?”

PROCEDURES

The simulation exercise used the Capsim Foundation Simulation. Capsim is the best-selling business simulation in the world. This simulation is used at over 500 universities and colleges in the US. The class was divided into teams to compete in

EXHIBIT 1 SELF-REPORTED PEER EVALUATIONS

Categories	Items
Self-management/Accountability	<ol style="list-style-type: none"> 1. Meeting attendance 2. Meeting preparation 3. Timely communication
Quality of Work & Contextual Performance	<ol style="list-style-type: none"> 1. Contributions reflected a thorough understanding of the team’s task 2. Presence on the team improved our team’s performance 3. Offered consistently high quality contributions 4. Was professional in all team interactions 5. Was open to hearing others’ opinions 6. Paid close attention to important details 7. Remained engaged even when the team’s results were not very good 8. Put forth good effort.
Quantity of Work	<ol style="list-style-type: none"> 1. Thinking about all the work your team accomplished in completing the Capstone simulation, please rate each team member regarding his share of the work.

a computer simulation by managing an imaginary firm that manufactured electronic sensors. The teams had to make research and development, production, marketing, and financial decisions concerning the product. The teams entered their decisions into the simulation and then analyzed the results once all the other team decisions were entered and processed. The simulation lasted for eight rounds representing eight years. Twenty-three students were divided into six teams for the preliminary exploratory study.

Task Work Data

The Balanced Scorecard scoring from the simulation was used to compare student success in the classes. The Balanced Scorecard allows companies to gauge their performance by assessing measures in four categories:

- Financial - includes profitability, leverage and stock price;
- Internal Business Process - ranks, among other measures, contribution margin, plant utilization and days of working capital;

**EXHIBIT 2
PRELIMINARY TEAM BSC RESULTS**

Round	1	2	3	4	5	6	7	8	Re-cap	Total
Possible Pts	8	8	8	100	100	100	100	100	240	1000
Andrews	3	4	4	5	5	5	5	7	162	600
Baldwin	4	4	5	5	5	5	7	7	153	602
Chester	3	5	6	6	7	6	7	7	157	680
Digby	4	5	6	6	6	6	6	6	150	653
Fin	4	5	5	5	5	5	5	5	100	500

Report Details

Self-management/ Accountability

Questions	Self-Ratings	Peer Rating of You	Team Average
Meeting Attendance.	5	4.64 <small>details</small>	4.67
Meeting Preparation.	5	4.64 <small>details</small>	4.66
Timely Communication.	5	4.63 <small>details</small>	4.66
Overall Quality of Work & Contextual Performance Score	5.00	4.64	4.66

Graphical Representation:

■ Self-Rating ■ Peer Rating Of You ■ Team Average

- Customer - examines the company's product line, including how well it satisfies buying criteria and awareness / accessibility levels;
- Learning and Growth - evaluates employee productivity.

The Balanced Scorecard allocates points in each of these four areas for each of the rounds and a final recap score. The team with the highest BSC is considered to be the winner of the simulation rather than just the team with the highest stock price or highest profits. Since the Balanced Scorecard allocates points in four major sections, it is considered a more representative measure of success.

Team Work Data

The new peer evaluation appears as an online questionnaire with a simple slider scale of 1 to 5. Each student completes the peer evaluation after the simulation is completed. The process is quick and easy to complete. Each student provides a self ranking and a peer ranking for each member of their team. The measurement criterion for the new Capsim peer evaluation has three conceptual categories:

- Self management/Accountability – Includes meeting attendance, preparation for meetings, and timely communication
- Quality of Work & Contextual Performance – Includes quality of contributions, consideration of other members,

EXHIBIT 4 PRELIMINARY PEER EVALUATION SUMMARY

Self-management/ Accountability			
Questions	Self-Ratings	Peer Rating of You	Team Average
Meeting Attendance	4.5	5	4.94
Meeting Preparation.	4.3	3.8	4.63
Timely Communication.	4.5	4.7	4.88
Overall Quality of Work & Performance Score	4.43	4.5	4.82
Quality of Work & Contextual Performance			
Questions	Self-Ratings	Peer Rating of You	Team Average
Presence on team improved our team's performance.	3.9	4.5	4.77
Contributions reflected an understanding of the task.	3.9	5	4.88
Offered consistently high quality contributions.	4	4.4	4.76
Was courteous and professional in team interactions.	4	5	4.89
Was open to hearing others' opinions.	4	5	4.77
Paid close attention to important details.	4	5	4.89
Remained engaged when team's results not very good.	4	4.65	4.81
Put forth good effort.	4	4.4	4.72
Overall Quantity of Work Score	3.98	4.74	4.81
Quantity of Work			
	Self-Ratings	Peer Rating of You	Team Average
Overall Self-management/ Accountability Score	30	34	33.33
Comments			
Student 1 - It seems that he is very busy with work, he had limited participation			
Student 2 - No comments submitted.			
Student 3 - Participates in the discussions, gives good analysis of each round of the simulation.			

**EXHIBIT 5
ADDITIONAL TEAM BSC RESULTS**

Round	1	2	3	4	5	6	7	8	Re cap	To tal	and de-
Possible Pts	82	89	89	100	100	100	100	100	0	2400	10
An- drews	58	55	54	60	60	61	66	70	8	112	60
Baldwin	48	62	72	88	89	89	90	92	0	240	87
Chester	50	58	53	25	35	31	34	32	56	4	37
Digby	53	67	66	92	94	95	85	96	22	4	87
Erie	52	51	52	57	64	58	62	61	5	98	55
Self-management/ Accountability	57	65	57	67	69	70	69	73	2	119	63

**EXHIBIT 6
ADDITIONAL PEER EVALUATION SUMMARY**

Questions	Self-Ratings	Peer Rating of You	Team Average
Meeting Attendance	5	4	4.78
Meeting Preparation.	5	3.4	4.57
Timely Communication.	5	3	4.29
Overall Quality of Work & Performance Score	5	3.47	4.55

Quality of Work & Contextual Performance

Questions	Self-Ratings	Peer Rating of You	Team Average
Presence on team improved our team's performance.	5	4	4.47
Contributions reflected an understanding of the task.	5	4	4.51
Offered consistently high quality contributions.	5	3.25	4.43
Was courteous and professional in team interactions.	5	4.95	4.97
Was open to hearing others' opinions.	5	4.95	4.87
Paid close attention to important details.	5	3.65	4.63
Remained engaged when team's results not very good.	5	4.5	4.67
Put forth good effort.	5	3.4	4.6
Overall Quantity of Work Score	5	4.09	4.64

Quantity of Work

	Self-Ratings	Peer Rating of You	Team Average
Overall Self-management/ Accountability Score	33.3	25	33.33

Comments

- Student 1 - Great team.
- Student 2 - Needs to translate ideas into sim inputs.
- Student 3 - Never responded to emails about the simulation.

pendability

- Quantity of Work – covers willingness to do a “fair share” of necessary work.

Details are shown in exhibit 1.

FINDINGS

Preliminary Findings

The research question was originally evaluated based on the data gathered from one class with six teams. Additional data will be collected from more classes during future semesters to extend this study. An example from a Fall 2015 class is included under additional findings below.

1. The BSC ranking of the six teams. Exhibit 2 shows the BSC ranking of the six teams. As can be seen, the team Chester had the highest BSC score and therefore was considered the best team with respect to task work.
2. The peer evaluations graphics. Exhibit 3 shows an example of the graphics that is available from the peer evaluations for one member of one of the six teams.
3. The peer evaluations of the six teams. Exhibit 4 shows the details of the peer evaluations of one member of the six teams. Based on the data from all the members of the six teams, it was determined that team Chester had the highest team work score. In the original exploratory study, this is the same team that had the highest task work score which validates our assumption for this one case. Additional data will be collected on additional graduate and undergraduate classes – see additional findings below.

Additional Findings

Additional data was collected on a graduate strategy course which completed in Fall 2015. This data illustrates some of the complexity in evaluating team performance as discussed below. The class was a small class of 8 students which was divided into

3 teams (Baldwin, Chester, and Digby) of 3, 2, and 3 students with the remaining 3 teams being computer teams with average ability. Two of the teams (Baldwin and Digby) had outstanding BSC scores as shown in exhibit 5 but Digby had team peer evaluation problems – one of their team members didn’t contribute to the team - as shown in the team peer evaluations in exhibit 6. However the other 2 team members were able to overcome that lack of contribution and still placed first in the BSC scoring.

Even though the peer evaluations did not predict the BSC winner as in the original study, this additional data set still provided some new insights into evaluating team performance. Lack of a team member’s support can be overcome by the other team members providing additional work. The capsim peer evaluation was a useful tool for team members evaluating each other. They did rate one of their members very low instead of the typical evaluation of just saying everyone did their share. Since the capsim peer evaluation has multiple areas for evaluation, it seems that the students were more thoughtful in assigning team member scores.

Discussion

University and government reports show that team work is now required in today’s workplace. Universities are increasing the use of team work in almost every class. However, grading of individual performance is more complex with the extensive use of teams.

This exploratory study showed how improved peer evaluations can be a useful tool to determine individual performance in a group setting. However, due to the complexity of team work, dedicated teams seem to be able to overcome lack of contribution of some team members and still be very successful in the task work. These improved peer evaluation are helpful in evaluating classes that use team based projects but are not a perfect predictor of team task work due to the complexity of team work and the possible additional effort by a few dedicated team members. Additional data will be collected for further insight into the complex relationship of task work and team work.

REFERENCES

- Anderson, S. and Coffey, B. (2004). The student’s view of a business simulation: Perceived value of the learning experience, Proceedings of the Academy of Management Conference, New Orleans, Louisiana, August, 2004.
- Capsim: New Peer Evaluation Instructor Guide (2015), Capsim Management Simulations, Inc.
- Chasteen, L. and Damonte, S. (2007). International Business Education: Insight from the Changing Environment of the EU. Proceedings of the Southwest Academy of Management Conference, San Diego, California, April, 2008.
- Chasteen, L. (2014). Simulations for Strategy Courses: Comparing Online and On-campus courses. Proceedings of the ABSEL Conference, Orlando, Florida, March, 2014.
- Dale, Edgar. (1969). Building a Learning Environment. Bloomington, Ind.: Phi Delta Kappa Educational Foundation
- Lam, S. K., & Shaubroeck, J. (2000). Improving group decisions by better pooling information: A comparative advantage of group decision support systems. *Journal of Applied Psychology*, 85(4): 565–573.
- www.capsim.com (2015). Website of Capsim Management Simulations, Inc.