

YOU HAVE TROUBLES MY FRIEND: THAT STARTS WITH T AND THAT RHYMES WITH B AND THAT STANDS FOR BUSINESS SIMULATIONS

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ABSTRACT

Faculty members that use business simulations in their classes tend to consider that simulations are effective and enjoyable ways to learn business skills. But is this true? This paper, by the use of an electronic survey of students just after they had completed a business simulation a set of questions about how they felt about the business simulation. His survey was presented to students from a variety of US Universities in order to remove the bias of gathering information from only one university or a single professor or those who used only a particular simulation. The survey results show that as many as one quarter or 25 percent of the students reported that the initial assumption of "It is fun and educational" is not true for them. This are important finds and they need to be addressed.

INTRODUCTION

The research project in which this paper is only a small part, will hopefully shed light on this type of learning. As a result of this project, there have been several research papers published using data collected from students at multiple US universities authored by multiple authors. This is just one of the papers produced with more to come. Existing papers have been authored by Teach and Szot (2018a), Chasteen, Szot & Teach (2018), Teach and Szot (2018b) and Nugent (2018). The reason for this research program is an attempt to measure the learning that takes place when students participate in a business simulation. Some of the theory leading up to measuring participant skills learning was developed by Teach (2018).

It is general assumed that business simulations are a teaching process that every or almost every student enjoys and they are able to turn the experience into a learning experience. Business simulations are used by the vast majority of business schools. One USA study (Faria 1998) showed that over 62 per cent of large business firms use simulation games in their training programs and about 97.5 per cent of AACSB member schools use simulations in their programs. Participant learning from a business simulation is critical if this methodology is to continue to be so universally adopted. However, the measurement of the learning that takes place when participants play business simulations continues to be elusive. There have been many attempts at measuring the learning that student obtain when playing business simulations and most have failed. See Nation, Reed and Swank (2014), Gredler (2004), Paich and Sterman (1993), Galareau (2005), Vos (2015) and many others.

Do students need to like or enjoy their simulation experiences to learn from it? And if they do not like or enjoy this form of active learning, do they still learn from it? This paper attempts to answer some of these perplexing questions.

Why use business simulations in classrooms

Faculty members who use simulations in their classrooms believe in Activity Theory whether or not they know the term. What simulations need in order to have this theory to work is student involvement. Student involvement refers to the amount of physical and psychological energy that the student devotes to the academic experience. Thus, a highly involved student is one who, for example, devotes considerable energy to studying, spends much time on campus, participates actively in student organizations, and interacts frequently with faculty members and other students. (Austin, 1999). (This article was produced prior to the rise of on-line education.)

Active learning is where the participant is active in the learning process, and it occurs when the objective includes pragmatism and skill application. (Gopinath and Sawyer, 1999).

What kind of learning results occur when a student participates in a business simulation?

Business simulation is a sub-set of the rubric of experiential exercises and "experiential learning proposes a constructivist theory of learning whereby social knowledge is created and recreated in the personal knowledge of the learner." (Kolb and Kolb, 2005)

The term used in learning theory is called Activity Theory. It claims that learning can occur only within meaningful activities. (Bodker, 1991.) Activity Theory's primary assumption is that the activity and learning occur simultaneously. (Kaptelinin, 1996). Thus, the participation in a simulation is that meaningful activity. In addition, the use of business simulations results in Cooperative Learning. "Cooperative learning constitutes a special case of active learning, for it involves the use of small groups of students who work together with the goal of maximizing both their own learning and that of members of their group" (Johnson, Johnson, & Smith, 1991). The theory of cooperative learning is built on six propositions that are shared by the above three scholars.

1. Learning is best conceived as a process, not in terms of outcomes.

2. All learning is relearning
3. Learning requires the resolution of conflicts between dialectically opposed modes of adaptation to the world. Conflict, differences, and disagreement are what drive the learning process.
4. Learning is a holistic process of adaptation to the world.
5. Learning results from synergetic transactions between the person and the environment.
6. Learning is the process of creating knowledge.

Some do not enjoy playing business simulations

There is a general assumption that students enjoy the experiential activity that a business simulation provides and these activities are better able to learn from this activity. James Schreier (1975) wrote: "In feedback evaluation reports, this exercise went from one which received several comments on how much fun it was and how enjoyable it was to an exercise that was both fun and thought provoking." (Quote from page 110.) He went on and wrote: "The students who are experiencing, in many cases, their first simulation of a business world environment, find the focus on content delightfully refreshing, ultimately challenging, and if the results of their decisions are in any way what they expected, a very rewarding and enjoyable process." (Quote from page 110.) But, is this always a "rewarding and enjoyable process" and what happens if it not?

In 1981, HA Waggener wrote "Almost 78% of the respondents stated that the experience was enjoyable. They used expressions, such as, simulation was fun", "very enjoyable, "made learning more interesting", and "a 'wow experience'. (Quote from page 142.) Note the limitation of "almost 78 percent." This means that more than twenty percent of the class admitted that the experience was "less than enjoyable." In addition, this was an in-class result. How many, even if they were anonymous, did not want to suggest to their professor that the experience was not an enjoyable one. Thus, when the use of business simulations was in its infancy, it was recognized that not everyone considered business simulations as an enjoyable way of learning.

The phenomenon of asking students about issues about the use of simulation in a single class is always suspect. Do the students want to confront the faculty member or to praise the faculty member? The data collected by the current study was both anonymous and across many universities, many different business simulations, many different faculty members and by researchers who were not know by the students.

THE DATA

As the data was collected from students at numerous universities, the survey required approval by the Institutional Review Board (IRB) at Georgia Institute of Technology and several other universities also ran the survey through their own IRB process. The Georgia Tech IRB committee required the following statement to be appended to the beginning of the survey:

- You are being asked to volunteer for this research survey. This is an international survey about the business simulation that you have just participated in while in a college or university class. This research is being conducted by Dr. Richard Teach (Georgia Tech) and Dr. James Szot (UT Dallas). The purpose of this research is to better understand how students" participate in business simulations and the learning that takes place when students participate in a business simulation. This is critical information and we need your cooperation.
- All survey participants will remain anonymous, meaning your survey responses are not linked to you. Your instructor has forwarded the link to this questionnaire to you. Most students complete this survey in 10 to 15 minutes.
- Please note that there will be no compensation or costs for your participation and there are no anticipated risks or benefits to you by completing this form.
- At the end of this survey, you may choose to send your anonymous responses to your course instructor. You do not waive any of your legal rights by participating in this study.
- If you have any questions about your rights as a research participant, you may contact Melanie Clark, Georgia Institute of Technology, Office of Research Integrity Assurance, at (404) 894-6942.

As a result, some university professors had only a small percentage of their class willing to complete or even partially complete the survey. While other faculty had almost every student complete the form

Contacted faculty members at many US universities were asked to distribute the surveys and those that had responses are reported in the acknowledgement section of this paper. The questionnaire was constructed using the Qualtrics survey design software. The data were collected and stored by Qualtrics, Inc. The data were analyzed using SPSS.

A copy of the survey was emailed to faculty members for review and if they approved of the survey they were asked to assist in the research by forwarding the address of the anonymous survey to their students after the last round of the business simulation they were using in their classes. This process assured the students of the legitimacy of the survey. The actual number of students that received the survey is unknown. If a student began the survey by responding to the first question: "Do you wish to participate in this international study of learning by the use of a business simulation? 1 = Yes, 2 = No." If the student answered this question with a "Yes," a record of the student's participation was recorded. All the data were received without any personal identification being recorded.

Table 1 shows the breakdown of student participants and the number of acceptable surveys processed in the analysis for this paper.

After the the sample, the illogical data needed to be culled. What is illogical data? When a survey respondent gets bored, ges tired or tuns to michevius behavior, they leave tell-tail signs. One sign is to record the same value for a string of responses (666666). Another sign is when a pattern appears in their coded responses; and example would be 63636363 or 12345678. These

responses may in some sections of the survey and not in others. As a result, the individual responses were tested for these anomalies. In addition, some students leave some questions unanswered. The removal of affected data and unanswered questions results on unequal cell sizes in a variety of analyses.

**TABLE 1
THE NUMBER OF STUDENT RESPONSES**

The total student responses received	847
The number that decided not to participate after starting the survey	142
Number available for analysis	701

Note that students had the freedom to respond or not to respond to most questions on the survey.

The mean time to complete the survey was 9.9 minutes and 85% of the students completed it within 15 minutes.

THE ANALYSIS

The result of the statistical analysis is shown in Table 2. The more significant values are shown in bold. Note that when analyzing

**TABLE 2.
FREQUENCY COUNTS OF STUDENTS' ATTITUDES
ABOUT THE BUSINESS SIMULATIONS THEY USED**

Question	# that Disagreed	% that Disagreed	# that Agreed	% that Agreed	N	Sig. with GPA	Sig. with My Team Finished
The Simulation was both fun and educational. This question was omitted from one survey administration. Thus a low N.	36	24.8%	109	75.1%	145	0.381	0.006
The learning experience of the business simulation will lead to a better job.	122	17.3%	401	76.7%	523	0.075	0.141
Playing the business simulation was a worthwhile.	138	26.4%	385	73.6%	523	0.625	0.493
What I learned from the business simulation was valuable.	101	18.1%	423	81.70%	523	0.746	0.335
I was well prepared to participate in the business simulation	114	27.8%	296	72.2%	410	0.994	0.047
The business simulation was unrealistic.	281	68.4%	130	31.6%	411	0.167	9.947
The business simulation took entirely too much time.	294	71.6%	119	28.4%	410	0.003	0.522
The business simulation took entirely too much effort.	296	72.0%	115	28.0%	411	0.067	0.061
I spent more time on this course than I spent on any other course that I had this semester.	190	46.3%	220	53.7%	410	0.027	0.068
The simulation represented the "Real World."	132	32.3%	277	67.7	409	0.119	0.417
The Simulation was unrealistic	281	68.4%	130	31.6%	411	0.167	0.121
Correlation between team placement and the student's GPA							

The original data was collected using a 6 point Likert scale where 1 = Disagree Strongly and 6 = Agree Strongly
 The frequency counts combined the three Disagree responses and the three Agree responses.
 The significant levels were calculated using an Analysis of Variance of the means of the original six point scale.

The most important point shown in Table 2 is that approximately one fourth of students participating in a business simulation did not like it! This dislike response was not statistically significant when considering the students grade point average. The "p"

value was 0.318. However, it is highly significant with the team's final placement in the competition with other teams, with a "p" value of 0.006. This may be an anomaly of the timing of the data collection. The data were collected after the last round of play. Thus, in the short run, winners learned more and had more fun if their team placed higher. No surprise here.

There was a low correlation between the students' self-reported GPA and the students' self-reported ranking of his or her team after the last round of the simulation. The correlation coefficient was 0.108, but that correlation had a "p" value of 0.009 and an N = 586. Thus, while highly significant it explained very little variance.

The students' responses to "The business simulation took entirely too much time," was statistically significant with the students' Grade Point Average. The GPA was student estimated on a 4.0 basis using two decimal places. That "p" value was 0.003. Students with high grade point averages tended to not agree with the statement and students with lower GPAs tended to agree with the statement.

When it came to how well the student's team placed in the competition, the feeling that the simulation took too much time was immaterial.

When the question was "The simulation took entirely too much effort" the difference between higher GPA and lower GPAs had a "p" value of 0.067. (When using data where the cost of being wrong is small, I tend to loosen-up the traditional 0.05 significance level.) Thus, it appears that students with higher grades tend to be more tolerant of greater effort than did students with lower grades. When comparing these responses to the student team's competitive placement the "p" value was 0.061. Students whose team placed higher in the competition were more tolerant than students whose teams placed lower in the competition.

A second variable; "I was well prepared to participate in the business simulation" with a "p" value of 0.076 could be considered as having an important relationship with the students' GPA. Students with lower grades may feel unprepared. Recall that a student's firm is a group project and not the result of a single student's efforts.

When it came to how well the students' team placed in the simulation competition, one variable: "I spent more time on this course than I spent on any other course that I had this semester" had a "p" value of 0.038. Thus, those who spent an extraordinary amount of time finished higher than teams that did not or could not spend the amount of time needed to "win." As a side note, I was chastized by a fellow faculty member in a faculty meeting that my students were spending too much time on the simulation I was using and not enough time on his course. I responded, "I guess those students understand the concept of Return on Investor Time." Most, but not all faculty members responded with laughter.

The other variable that clearly had an effect upon the student's team's competitive position was; "I was well prepared to participate in the business simulation" with a "p" value of 0.094. Preparation from other courses taken before undertaking a business simulation is critically important and before we allow students to "play" a business game, the prerequisites.

When the question was, "The learning experience of the business simulation will lead to a better job," the data shows that students that have better grades tend to think this is true while students with lower GPAs tend not to think this is true.

When it comes to the simulation's realism and the students' GPA and team placement after the last round, the relationships had a "p" value of 0.167 and 0.121. Clearly these relationships are not traditionally significant, but these relationships still may be important. Faculty must remember that over one-fifth or more of the students do not think the simulation is fun and educational.

IMPLICATIONS

Faculty members using a business simulation in their course(s) must remember that over one-fifth or more of the students do not think the simulation is fun and educational. In addition, students with commitments to other courses or non-curricular activities may not be able or willing to spend the necessary time to a course using a business simulation.

During the introduction, instructors must be clear about the simulations' time and effort requirements must be included.

I would suggest that the simulations' similarity to reality not be stressed. It is clear from only a cursory review, that most simulations are not very realistic. The one outstanding example is that, at the start all competitors have the same assets, liabilities and the same parameters; one would never find this condition in the "real world."

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