Exploring Practical Potentials of Business Simulation Games

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Abstract

With the emergence of the digital generation, advances in technology, and the trend towards more experiential learning formats, business simulation games (BSGs) are increasingly used by educators today. Of interest in this paper is the extent to which serious game playing, for business and technology professionals, influences work behaviors in practice. This study explores the business professional's sense-making process when consciously reasoning about how BSG learning influences business practice. We adapt Toulmin's framework for deconstructing practical reasoning to capture, analyze, and elicit patterns within arguments made regarding the application of BSG learning to business practice. The findings contribute to theories related to BSGs, and thus would benefit those practitioners who use BSGs.

1. Introduction

Advances in technology, learning theory and society as a whole, have led to the rapid evolution of game playing in classrooms of higher learning. Serious games, i.e., games developed for a primary "serious" purpose other than entertainment, have become popular and powerful tools for introducing business professionals to complex and challenging problem solving and decision making in practice. Games in business have been used to motivate employees, engage customers, improve marketing strategy, improve productivity and innovation, and improve the planet [61]. As the younger game savvy generations enter the business world, game playing, as a tool for educating and training our younger workforce will grow increasingly important [14].

A game, solely by its nature, is associated with fun and play. When using games in education, instructors often find students to be more engaging and focused, thus leading to more effective learning. Indeed, BSGs are widely adopted in business education institutes across various areas [17] [19]. Scholars have investigated various topics related to games in business education and training context [60] [19] [20]. However, past studies reported in the literature have not addressed the value of BSGs as it relates to actual work environments. In an earlier study published as a doctoral dissertation, the first author explored the process of using BSGs in business education [31]. Students were found to be motivated both intrinsically and extrinsically by playing BSGs, thus affecting learning outcomes. This paper reports on the extension of this earlier study and investigates how those who have used BSGs think they can apply the learning gained from BSGs to their real business environment.

To achieve the goal, this study analyzes written arguments reported by 43 professional informants, with a focus on applying BSGs to the practice of business. In this study the informants played multiple business simulation games during a semester long professional MBA course at a public university in Southern U.S. The research questions to be answered in this study are as follows:

1. How do business professionals discursively make sense of the potential application of BSG to business practice?
2. What kinds of patterns exist in the arguments for or against the potential application of BSG to business practice?

Toulmin's [56] sensemaking framework is adapted to analyze the informants' arguments. Toulmin's sensemaking framework provides an effective tool to deconstruct practical reasoning; this method is implemented in order to capture, analyze, and elicit patterns within the arguments [5]. This study identifies the types of sensemaking arguments which relate the value of BSG learning to real-world business practices. Thus, the patterns of sensemaking are revealed and interpreted.

In this paper, we will introduce the theoretical background through the Toulminian lens, which initiates a sensemaking process. Then the description and findings of the qualitative study will be presented. Discussions and conclusions based on the findings will follow.

2. Theoretical Background

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Sensemaking is the ongoing process of rationalizing what people are doing [59]. More specifically, it "involves turning circumstances into a situation that is comprehended explicitly in words and that serves as a springboard into action (p. 409, [59])." Weick [58] suggested seven properties of sensemaking: (1) identity construction; (2) retrospection; (3) sensible environment interaction; (4) socialization; (5) ongoing action; (6) focus on extracted cues; (7) choice of plausibility over accuracy. The sensemaking concept has been applied to various organizational contexts [5], especially in emerging areas where people usually feel an ambiguity toward reaction. As a result of the sensemaking process, individuals may construct a method of understanding a phenomena [57].

One of the main features of the sensemaking process is its emphasis on discourse. Sensemaking may be accomplished by means of individual notions within several environments, and is consequently formed by discourse with others. The discourse includes structured collections of meaningful text [42]. The texts may be written transcriptions, as well as "any kind of symbolic expression requiring physical medium and permitting of permanent storage (p. 109, [54])." Therefore, discourse may be found in various forms, inclusive of written documents, verbal reports, artwork, spoken words, pictures, symbols, buildings, and other artifacts [44]. Weick [58] [59] suggests that individual and social facets are inseparable in the sensemaking process. This corresponds to the tradition of those social theories that place an emphasis on discourse analysis [7] [12] [5]. By analyzing communication and language among people [44], analysis lends understanding to the social production of organizational and inter-organizational phenomena.

The process of discourse draws from an iterative nature. Speech act theory [3] [49] emphasizes the interaction between discourse and actions. The nature of discourse and its effects on social reality may be understood as situated symbolic action [28]. Moreover, discourse can form individual cognition, in which one can identify an interpretational situation, and then generate novel texts, which create a new action of discourse [5] [28]. The interpretation is accompanied by content, which may be called an *argument* [27] [56] [58], defined as [27] "a mode of communication whereby an individual makes an explicit claim and then supports, or thematizes, this claim to persuade others to accept it while anticipating criticism ([5], p. 688)." This approach of argument is consistent with Toulmin's [56] model of argumentation, which claims that argument is *movement* from accepted *grounds*, through *warrant*, to a *claim* [8] [16]. In his model, Toulmin identified different components of argument, further developed by researchers [21], and described in Table 1.

In this study, we assume that sensemaking of BSGs occurs by means of discursive arguments as interpreted by Toulmin's framework. For analysis purposes, we focus on informants' arguments. The key components of Toulmin's argument model are considered to be essential for argument analysis, i.e. claims, grounds, and warrants [16] [5]. Qualifiers and rebuttals are generally accepted as second tier argument components, which may be included in an argument, but not necessarily [8]. In addition, in this study the arguments are made by individual informants through written reports in relatively limited space, which constrains the informants to use more diverse argument components, such as qualifiers and rebuttals. Therefore, the three key components are the focus of analysis in this study.

Table 1. Components of argument

Argument Component	Description
Claims	The central assertion of the argument [5]; the "conclusion whose merits we are seeking to establish" (p. 90, [56]); the statement put forward for the audience to believe [21] [29]
Grounds (data or evidence)	The statements offered in support of the claim answering the question: "What do you have to go on?" [5]; identified on the basis of primary function within the context of the argument [21] [29]
Warrants	The principals or rules of inference answering the question "How did you get there?" [5]; the logical connection between claim and grounds [29]
Qualifiers	The statement used for showing the degree to which the claim is accepted as true [29]; reflects genuine doubts of speaker with regards to a claim [21]
Rebuttals	The statement for managing potential objections by stating conditions which the claim might hold or not hold [21] [29]

3. Research Methods

3.1. Data Collection

In our research we explore the sensemaking process of informants' arguments used to evaluate the potential of BSGs for use in practice. To this end, we asked 43 informants to each provide a written response to our inquiry. All informants were working professionals with three to ten years of experience

enrolled in an MBA technology and operations management course. These students each completed a number of BSGs throughout the course (illustrated in Table 2), each involving varying levels and types of managerial decision making.

The informants then were asked to submit a written response to our inquiry regarding their experience and learning using the BSGs. To ensure that the informants' response was focused, informants were given both verbal and written instructions and allowed two weeks to reply to this survey. To ensure a high response rate, extra bonus credit were granted to participants.

Table 2. Description of BSGs

Context	Role	Types of Decisions
High Tech Industry	IT Project Manager	Schedule, Scope, Budget, Team
Restaurant	Restaurant Manager	Restaurant layout and operating parameters
Production Analysis	Factory Manager	Process mapping and flow analysis
Global Supply Chain	Supply Chain Mgr	Sourcing, planning, execution
Consumer Product Supply Chain	IT Process Coordinator	Information and product flows, system constraints

3.2. Coding and Analysis Method

A grounded theory approach was used to analyze the arguments and draw observations and conclusions. Grounded theory in the pursuit of theoretical findings is widely used in IS studies, garnered through an intensive, data-driven, analysis process [10] [5]. The nature of grounded theory requires iterative data collection and analysis [10]. Theoretical sampling provides a key component in the pure application of grounded theory [39]. To analyze the data from single-iteration sampling, we use three types of coding techniques: open coding, axial coding, and selective coding [10].

In the open coding phase, each written report by informants was carefully read, highlighted, and identified for relevance to the study [10]. Relevant segments of text then were coded. As a result of open coding, 107 codes were created related to BSG learning to business practice. Each code was associated with one or more text segments.

In the axial coding phase, we focused on identifying the structure of text segments that mention BSG learning. The process seeks the assertions and supports used in the text segments and their relationships. By using Toulmin's framework (i.e., claim-ground-warrant) [56], each text segment is analyzed and labeled as one of the three components of argumentation [8] [21] [5]. For example, text segments that contained explicit evidence for the argument were labeled as claims. On the other hand, evidence that explicitly supported the arguments were labeled as grounds. Warrants are the logical connection between an argument and its grounds. Yet in many cases, warrants were not explicitly detailed in the data. Hence, warrants were interpreted based on the assumptions, together with argumentation found in the data [5].

Lastly, selective coding was conducted to integrate the result of analyses into categories. Specifically, the themes of claims, the contents of grounds, and the types of warrant were coded and categorized accordingly. An example of the coding process is presented in the Appendix. Throughout the iterative coding process, patterns of arguments were identified. All of the above coding procedures were conducted with MAXQDA software (version 11).

4. Analysis Results

The results of our analysis reveals three claim themes used to describe the application of BSGs to practice: (1) learning and training; (2) decision-making; and (3) business perspective.

4.1. Learning & Training

4.1.1. Enhancing Learning Experience. First, BSGs provide new learning experiences by their novel and compelling features. To *experience* something is often the most effective way of understanding it [26]. Our analysis of the informants' arguments support the idea of using BSGs for business education/training purposes.

For example, some informants (e.g., #21 in Appendix[1]) argue that BSGs add a unique experience to the learning process, which may help to enhance problem solving skills used in practice. The warrant used to leverage these grounds is the general principle that BSGs that model the complexity of real-world environments offer a good opportunity to prepare learners for the real-world situations. In addition, multiple informants (for example, #37 and #40) assert that BSGs help bridge theory to practice. By playing the simulation games, they gain a deeper understanding of complex phenomena.

It is clear that many arguments related to BSG learning rely on the ability of BSGs to provide a more realistic experience than traditional learning

[1] More example interview scripts are available upon request.

methods. To support the claims, informants use various types of grounds, including the general principle of the benefits of BSGs learning; the BSGs experience; and future projections concerning the lessons gained from BSGs. In addition, the claims are mostly supported through causal reasoning or generalization of the grounds.

4.1.2. Illustration Capability. Another claim that informants listed was the illustration capability that BSGs provide in the learning process. BSGs offer qualified, graphical user interfaces (GUI), as well as a visualization of game play that enables players to observe game dynamics. Unlike traditional learning formats, BSGs illustrate business concepts to game players by means of a visual stimulus via various graphics and animations.

Some informants (for example, #12) assert that simulation games have the capability to represent many complex relationships that occur in practice. They support the claim based on a causal reasoning that the characteristics used in simulation games may be used in most organizations. Other informants (for example, #25 and #9) mentioned the capability of BSGs to illustrating business concepts. The arguments regarding the illustration ability suggest that BSGs would be good training tools.

4.1.3. Engagement and Addiction. A number of informants stated that they felt enjoyment while playing BSGs, which led to greater engagement; some even describe the games so addictive that they found it difficult to stop. Some informants (for example, #23 and #35) attribute their addictive behavior due to the realistic nature of the game scenarios, and their desire to win (i.e., achieve higher goals). Realistic scenarios motivate players to work until they are satisfied with their performance.

4.1.4. Better Retention. A number of informants advocate that BSGs enhance the trainees' abilities to retain lessons learned from their playing experience. Informants (for example, #25) state that the knowledge obtained from BSGs would be in personal memory for a long time. Although no explicit warrant is stated, it is assumed that the ground relies on their personal projection.

4.2. Decision-making

4.2.1. Decision-making Assistance. BSGs usually require players to make various decisions during game play. By providing opportunities to make decisions with appropriate information, BSGs would assist business professionals to make better decisions. Informants (for example, #36) argues that BSGs increase decision-making skills by providing information in simulated real-time settings. They note that they would be able to do the same in their current job as they did in the BSGs, because the core conditions of the two environments were similar.

4.2.2. Decision-Outcome Relationship. Some informants argue that BSGs effectively show how certain choices would affect the outcomes (i.e., tying cause to affect). One novel feature of BSGs is to provide prompt feedback on each decision that is implemented by a player. Having access to more feedback on a timely basis will improve future decisions. Informants (for example, #4 and #20) mention that they found BSGs useful by showing decision-making outcomes based upon personal experience. Other informants also argue that a simulation game could help decision-making by showing, through their game playing experience, the interaction between different game factors.

4.2.3. Structured Problem-Solving. BSGs often require a certain approach toward solving problems, thus allowing players to learn the most efficient way to attack the problem. Informants (for example, #4) assert that BSGs provide the manner in which to apply text book theory to the real world. They support this assertion by taking their personal experience with BSGs into their workplace.

4.2.4. Risk-Free Exercise. Generally, skills for good decision-making are not easily obtained from traditional learning methods, such as textbooks and lectures. Rather, these may be gained from numerous trial-and-error tactics in actual decision-making experiences. However, conducting trial-and-error practices in real-world situations could be costly.

BSGs provide an ideal environment to enhance managers' decision-making skills by providing opportunities to choose various decision-making options, while avoiding real-world consequences. Informants (for example, #12 and #27) claim that BSGs have value in business by providing opportunity for risk-free decision making. They argue that BSGs could bring benefits to business decision-making, due to such features as providing a base knowledge for a decision-making framework.

4.3. Business Perspective

4.3.1. Macro View. BSGs often require players to manage cross-disciplinary business environments. Most informants noted the BSGs' capabilities to broaden their business views base their arguments on

their own experiences or projections with BSGs. They presume that others in the organization would have the same benefits from BSGs. Informants (for example, #32) emphasized that they could obtain a macro, cross-disciplinary perspective of the processes in their organizations through playing the simulation games in the course. Informants (for example, #42) argue that BSGs are helpful in understanding the other areas in their organization by allowing a projection of their personal thoughts. Informants suggest that the value of BSGs lie in providing new business perspectives for those who lack experience; therefore, they are able to consider how different business functions are nevertheless connected to one another. Informants usually use their personal experience in their own workplace to support their argumentations. Informants (for example, #22 and #43) argue that BSGs are useful for an understanding of how different business functions are connected to one another. They base the claim upon their own experience, relating that after playing the games they could understand the areas in their company that they had not previously considered.

5. Discussions

From the analysis, various claims as well as argument patterns were identified. Table 3 presents claims categories, specific claims, and patterns of grounds-warrants from informants' argumentations.

Table 3. Patterns of Argumentations

Category	Claim	Ground-warrant patterns
Learning & training	Enhancing learning experience	GP – CR
		PE – GE
		PP – GE
	Illustration capability	GP – CR
		PE – GE
	Engagement & addiction	GP – CR
		PE – GE
	Better retention	PP – GE
Decision-making	Decision-making assistance	PP – CR
	Demonstrating decision-outcome relationship	PE – GE
	Structured Problem-Solving	PE – GE
	Risk-free exercise	PE – GE
		GP – CR
Business perspective	Macro view	PE – GE
		PP – GE
GP: General Principle, PE: Personal Experience, PP: Personal Projection, CR: Causal Reasoning, GE: Generalization		

5.1. Themes of Argumentation

BSGs are known to be effective learning and training tools [38] [43] [34]. Various skills required for successful business practice, such as strategic thinking, planning, communication, collaboration, group decision-making, and negotiating skills, can be developed using BSGs [52] [51] [25]. BSGs provide a revolutionary change in corporate training by changing the trainee's role from passive to active, as well as the trainer's role from content delivery to facilitation [30] [52]. Research supports the idea that BSGs can deliver great value to practitioners.

5.1.1. Learning & Training. The findings identify four particular claims for why BSGs are beneficial from a learning and training standpoint. These claims include: learning experience, illustration capability, engagement, and retention.

First, working professionals argue that BSGs enhance learning experience. BSGs allow students to critically explore theory and practice experientially [32]. They also claim that BSGs fill the gap between theory and practice outside the classroom by creating an opportunity to apply the learned concept to the real-world business scenarios [33] [35]. For these reasons, BSGs are believed to typify experiential learning methods [19] [24] [47]. Accordingly, a few informants fully acknowledge the learning potential of BSGs, and support this assertion in their argumentations.

Second, by observing illustrations of how things work in BSGs, learners tend to absorb business concepts more efficiently than by means of other instructive methods [37]. Seeing an illustration culminates in higher retention rates in contrast to other traditional learning methods such as audio-visual, reading, or lecture [53]. Indeed, a number of informants claim that they received benefits in learning the concepts through the BSGs's illustrating capability during the course. These informants also argue that the illustration features of BSGs can, in general, be used effectively to train employees.

Third, a number of informants argued that BSGs could be an effective learning tool due to the engaging and addictive characteristics. Enjoyment is one of the most unique features of BSGs compared to other learning and training methods [38] [25] [45]. Enjoyment by nature leads to further engagement which motivates students toward gaining better learning outcomes [11] [23]. We found that a number of informants perceive that the potential value of BSGs in learning and training perspectives increased due to the engaging characteristics. Many informants mention they felt enjoyment playing the BSGs in the course. Accordingly, working professionals find that BSGs would be an effective training tool in practice.

Lastly, informants argue that BSGs provide them with better learning retention from playing. It was previously found that learning by games would improve an individual's retention rate when compared to other learning methods [23] [46]. Retention rate is generally related to a student's interest level [40]. Researchers note that BSGs tend to aptly engage trainees, since engagement and interests in learning are closely related [50]. The result tends to be a better retention of knowledge. Informants of this study mention that the knowledge gained from playing the BSGs in the course would last longer for each player, which would be the same in the real-world business training.

5.1.2. Decision-making. Analysis of arguments reveals that BSGs learning could influence decision-making in practice. From the analysis, BSGs are deemed to be applicable to business decision-making in four aspects: 1) decision-making assistance, 2) demonstrating decision-outcome relationship, 3) structured problem-solving, and 4) risk-free exercise.

First, informants argue that BSGs could assist them to make better decisions. Generally, games display a collection of decision-making activities. Players pursue their goals within the game context [1]. At the same time, games provide a good opportunity for decision-making practice. Likewise, BSGs are designed with decision-making assistance features for players. They feed players with relevant information such as current status, factors influencing outcome, and anticipated consequences of the decision. Also, many recent BSGs offer players a cockpit-style management control screen. Researchers claim that BSGs provide experience with the integration of a complex decision processes [43] [48] [63]. Employees who received game-based training were more accomplished at making decisions than non-game employees [4]. Correspondingly, informants find a value of BSGs toward enhanced decision-making skills.

Second, business professionals find BSGs useful in demonstrating how a certain decisions cause an outcome. Many BSGs present players manageable situations, so the players can easily understand the relationships among the factors [9]. Players also can receive immediate and clear feedback [18] [43]. Hence, through playing BSGs, players can acquire a clear understanding of the relationship among the business elements, as well as gain insights on how different decisions would yield different outcomes. BSGs allow players to experience the change over time [9]. Further, the games are helpful for players to understand systemic effects and consequences [36].

Third, the BSGs are found to be effective as a tool that provides a structured, problem-solving approach to working professionals. One of the benefits that a participant can experience in BSGs is to be exposed to diverse business scenarios [48]. The problem-solving skills for such diverse scenarios may not be easily attained by traditional learning methods, due to the inter-relation of many complex factors. Through playing BSGs, participants could develop skills related to problem-solving and strategic decision-making, as well as behavioral skills [48] [55].

Fourth, BSGs provide a risk-free environment for experimenting. Decision-making skills can be learned effectively through an empirical trial-and-error approach [15]. By allowing participants to iterate the decision-making process with different strategies, BSGs help the participants acquire decision-making skills more efficiently than traditional learning methods [18] [22] [48]. In contrast to decisions made in real-world situations that have real financial/social consequences, BSGs activities are relevant in the game itself. This risk-free approach provides BSGs players with confidence and less stress [2]. The informants in this study accordingly note the value of BSGs in risk-free, trial-and-error decision exercises.

5.1.3. Business perspective. By means of dealing with a wide range of business processes and functions, BSGs effectively aid business professionals to understand overall business environments, which in turn enables better performance. Informant claims focus on the benefits of gaining a macro business perspective.

BSGs may allow participants to learn in all areas of business [18]. BSGs are usually designed for players to experience the processes in cross-disciplinary fashion to find relationships or structures among the information components [63]. Many business professionals work in a specific discipline, yet even these individuals switch disciplines from time to time. Hence, for those who work in silos, it might be difficult to understand how other parts of the organization operate and what their priorities are. BSGs permit business professionals to grasp macro business perspectives, enhancing their managerial skills. Several informants in this study mention this.

5.2. Patterns of Argumentation

Given that the application of BSGs to business practice is not extensively studied, it is worthwhile to understand how working professionals make sense of these new business tools. While sensemaking is an individual activity [58], it can be socially applied, since individuals project themselves in the context of social groups or organizations [5]. Hence, sensemaking could be also called a social activity [6]

[13]. In regard to the discourse of the informants toward BSGs, we find argumentation patterns, focusing on an inherent direction of organizational strategy toward adoption or use of BSGs.

Reviewing the written reports obtained from the 43 informants, we found that their arguments are mostly based upon their firsthand experience with BSGs in the course. One pattern revealed frequently by the analysis of the arguments is *generalization – personal experience* pattern, through which informants assume that their experience with BSGs will be generalized in a business environment. This would be natural; individuals who go through a certain phenomenon and gain a positive experience tend to insist on the positive value of the phenomenon, based on their experiences. This type of retrospective sensemaking conforms well to Weickian social psychology [57] [5]. However, this evaluation of value should be accepted with caution, because the choice could be biased for confirmation. More specifically, people might select only a positive evidence of ground to support their claim, however non-intentional [41]. Nonetheless, this pattern is a frequent and powerful pattern, used to make sense when identifying the value of BSGs in practice.

Another identified pattern is *generalization – personal projection*. This is similar to the previous pattern, except the ground is based on the individual's projection that he plans to continue with BSGs in his own working environment. In this pattern, informants usually ground their claim on their opinions of the BSGs or their expectations that they can proceed with the BSGs. These project their opinions/expectations, obtained from playing BSGs, to their workplace environment. Then they assume that their projection would be generally accepted by other working professionals or business practices. This pattern also might be susceptible to confirmation bias. However, given that this is a frequent pattern of argument throughout the analysis, it could be accepted as an appropriate pattern of making sense in an application of BSGs to business practice.

There are also arguments based on a *causal reasoning – general principle* pattern, which relates to the informants' reasoning of value of BSGs. In this pattern, informants assert that BSGs are effective toward bringing value to business practice. To support the claim, these respondents apply a general principle regarding the learning or management process. In most cases, the informants consider that general principles are applicable to the use of BSGs in the business environment. This pattern frequently appears in the analysis, which suggests that it is a common pattern for making sense of the application of BSGs to business practice.

The analysis of this study reveals that there are largely three types of grounds and two types of warrants. And the argument patterns are basically the combinations of the identified grounds and warrants. There are two reasons why there are a limited number of argument patterns appearing from the analysis.

First, the objective of this study is to understand how business professionals accept the values of BSGs and transfer the values to their workplace. Arguments can be classified into three main types: substantive, authoritative, and motivational [8]. Given that the informants are asked for their own opinions regarding the research topic, the arguments that the informants made are likely to be a substantive type argument, in which warrants usually reflect an assumption regarding the way that they see the world around them [8]. Thus, there would be not much room for authoritative arguments or motivational arguments to be used in this type of topic. This is one reason why only limited patterns of arguments are revealed through the analysis.

Second, this study mainly asks individual informants to provide their arguments regarding the potential transferable values of BSGs to their workplace based on their involvement in BSGs throughout their course work. Most of their answers come from their personal experiences or thoughts. This is why many grounds are based on personal experience/projection. Hence, informants make sense of values of BSGs (i.e., their claims) and generalize them to a generic situation in many cases.

5.3. Implications

Despite the growing interests in simulation games and, in particular, business simulation games [62], there remain significant gaps in our understanding of the degree to which game playing influences the behavior of professionals with problem solving and decision making effectiveness. This study attempts to first help fill the gap by analyzing the arguments about BSGs from those working professionals who have extensive experience with BSGs, and second to gain a better understanding of the application of BSGs by viewing the sensemaking patterns of arguments. This stream of research should help to shed further light on the theories related to the sensemaking process of business professionals when they accept a new (technology enabled) business tool.

We expect that this research will help practitioners understand how best to leverage BSGs to enhance their productivity and effectiveness in problem solving and decision making capacities. The identified categories in the application of BSGs, as well as the specific claims obtained from working

professionals, are offered to broaden practitioners' knowledge. Further, those who consider using BSGs in the business education/training sector will gain insights regarding how to improve their current/future curricula. With its compatibility to a new, generational learning method, the importance of BSGs in business education/training is expected to grow. In order to most effectively adopt BSGs in curricula, especially in professional and executive programs, it is vital to understand how business professionals perceive the value of BSGs. This study begins to shed light on how educators' can enhanced business education in a way that lends itself to our future generations, the millennials and beyond.

5.4. Limitations

This study has limitations. The analysis in this study is based on the written reports from informants who have taken an MBA course, which could be considered a limited data source. Also, they played the same BSGs. As discussed in the discussion section, the homogeneity in data source might have constrained the diversity of data. Also, there might not have been sufficient time for informants to reflect on the real value of BSGs at their workplace. Many students actually mentioned it was their first experience in playing BSGs extensively. To overcome these limitations, a future study may be based on data from more general situations, such as data gathered from individuals who have experienced BSGs for years in various business areas.

Another issue to be noted is the theoretical lens adopted for this study. A Toulminian sensemaking framework is a useful way to exhibit the sensemaking process of IT adoption [5] [29], but the framework is mostly used to interpret *past* or *current* practices rather than *future* expectation. Therefore, the contributions of this study might pose a constraint in providing the value of BSGs that have been identified by working professionals to date. Given that BSGs are not yet widely adopted in business practice, it is still worthwhile to reflect on the previous and current values, since few discursive analyses are available.

6. Conclusions

This study identifies the sensemaking process of business professionals in regard to the application of BSGs to business practice. The findings of this study suggest that patterns of argumentation exist at present. This study found potentially applicable areas for these patterns in business simulation games. The results concur with the informants' findings: The conclusions contribute to theories related to business simulation games, and thus benefit those practitioners who would use business simulation games.

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Appendix: Coding Process Example

Coding phase	Coding activity	Example (Excerpted from Informant's [#21] report)
Open coding	Step 1: Read the written reports carefully Step 2: Mark segments of text related to the transferring values of business simulation games to business practices	"The first Simulation that we as a class were introduced to was in relation to the subject matter of project management. The Project management simulation introduced the concept of "Scope, Resources, and Schedule," and how tradeoffs within the given resources have to be balanced. The simulations we carried out ranged from simple process analytics to global supply chain management. The additional simulations that followed, the basic concept was a simple one of reinforcing managerial concepts in operations along with providing students an applicable way of exploring and discussing their decisions. *The variety of decisions made and rationale behind the decision making process of the simulation game was intriguing and beneficial providing immediate feedback. It allowed students to see multiple view points for the same problem and discuss the analysis in reaching that point. Though I feel the course could have benefitted from more in class discussions following these simulations, the experience was still enjoyable and mentally stimulating.* *I am truly excited to apply the learned concepts of the material referenced and experience gained through the simulation games. Although I have yet to apply these concepts in my current position as the sales coordinator for the XXX* I have begun to outline some proposed changes that have been inspired and encouraged through my understanding of the material and application of concepts in a simulated environment. In addition, this summer I will be on the Global Supply Chain process improvement project for hydroprocessing catalyst. And though the material taught within this course has given me the foundation to provide value to my organization, it is the simulations that have given me the ability to see how the learned concepts are applicable.* *The Global supply chain management simulation played within this course has given me the ability to experience the bullwhip effect in relation to the global environment.* For example one of the identified or defined issues that will be explored in our upcoming supply chain project is the inconsistency with the inventory of raw materials. *The experience gained through the simulation has helped me understand in hypothesizes that one of the possible reason for the inconsistency in raw material inventory could be the bullwhip effect. The opportunity to apply this knowledge and actual experience gained through the simulation will be invaluable both to my organization and me."*
Axial coding	Step 3: Code the claim concerning the value of business simulation games Step 4: Code the ground supporting the claims Step 5: Code the warrant connecting the ground with the claim	Claim: Business simulation games provide learners with opportunity to experience with applying theoretical concepts to real situation. Ground: I could learn the concepts through other materials and simulation helped me understand how the concepts are applied through simulations. Warrant: My experience with business simulation game that helps me understand concepts and apply them to my workplace will be applicable to other people. (Inferred from the context)
Selective coding	Step 6: Identify the topic of claim Step 7: Identify the type of ground Step 8: Identify the type of warrant Step 9: Identify the pattern of argumentation	Topic of claim: Enhancing learning experience Ground: Personal Experience Warrant: Generalization Argumentation pattern: [Enhancing learning experience] – [Generalization] – [Personal Experience]

*: anonymized company name