THE USE OF BUSINESS GAMES AT DIFFERENT EDUCATIONAL LEVELS: INTEGRATION, PRACTICE AND RESEARCH INVOLVING UNDERGRADUATE AND GRADUATE MANAGEMENT STUDENTS

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ABSTRACT

Although articulation between teaching and research is a constructive precept of Brazilian universities, there is a gap between undergraduate programs, with focus on teaching, and graduate programs, with focus on research. Considering the potential of business games for managerial education, allowing practice (under controlled risk and uncertainty) and research, within the precepts of management laboratories, it is necessary to consider the use of this methodological approach at different educational levels with the aim of integrating undergraduate and graduate students. Thus, the aim of this article is to better understand the process of integrating students of different educational levels through business games. The study is qualitative and exploratory-descriptive, based on the experience of playing a business game by undergraduate students enrolled in the discipline called "Simulated Business Management" along with graduate students enrolled in the discipline called "Management Laboratory II" at a federal university in the southern region of the state of Rio de Janeiro. The data were collected through semi-structured interviews and were submitted to content analysis. The results indicated that the integration between graduate and undergraduate students during the managerial experience led to maintenance or improvement of the quality of social learning through the business game. They also indicated that the articulation between teaching and research at different levels of education, through business games, can contribute to more virtuous relationship between undergraduate and graduate education.

Keywords: business games; integration; undergraduate; graduate.

INTRODUCTION

The training of management professionals requires innovative teaching methods, since the conventional teacher-centered model no longer meets the expectations of students and the market. To fill this gap, business games are an alternative, by permitting the development of management practices and decision-making skills (Rosas & Sauaia, 2006; Closs & Aramburu; Antunes, 2009; Oliveira & Sauaia, 2011; Kriz & Auchter, 2016).

In this respect, one of the challenges of management education, be it in academia or in-company training programs, is to provide a holistic learning environment. To surmount this challenge, one of the alternatives is to use experiential learning methods, such as business games (Sauaia, 2013; Oliveira & Sauaia, 2011). In an extensive study, Kriz and Auchter (2016) found that the majority of the students surveyed preferred experiential teaching methods over conventional ones and that the long-term effects of teaching were more evident in students submitted to an experiential learning process.

Besides this, the transposition of theory into practice in a controlled setting allows the students to make decisions under risk and uncertainty, establish cause-effect relations and develop management competencies in a process of learning by doing. That interaction facilitates attaining significant learning, experienced in the Kolb cycle (Kolb & Kolb, 2005; Motta, Melo & Paixão, 2012).

In light of these multiple contexts, the proposal of a management laboratory that congregates business games, simulators and applied research tools is to allow students to rub elbows with the world of scientific research besides playing the games (Oliveira, 2009; Saiaua, 2013; Silva, 2015). Research is indispensable in the training of students, since the articulation of teaching, research and extension is a precept of most universities. Although discussions occur about the inseparability of this articulation, only a few effective actions to enable real integration between undergraduate and graduate students can be found in the literature (Nicolini, 2003; Bertero, 2007; Pinto & Motter Junior, 2012; Rodrigues, 2012).

Therefore, the objective of this study is to shed light on a proposal to integrate students at different levels (undergraduate and graduate) by means of business games, to identify the pros and cons of the process. Within this panorama, the research problem is to answer the following question: What are the advantages and disadvantages of using business games to integrate undergraduate and graduate business administration students?

That question is justified by the need to innovate in management teaching practices, to encourage research and learning through action, along with the duty of universities to break down the barriers between teaching and research. In this respect, other researchers have found satisfactory results through the promotion of interchange between students of different levels to foster the collective construction of knowledge and research (Cury, 2004; Fernandes et al., 2015).

The first supposition of this study is that social learning can occur through student-student relationships, and the quality and intensity of these relationships are variables that impact the success of applying educational games (Kriz & Hense, 2006). The second supposition rests on the criteria proposed by Kriz and Hense (2006) to measure the quality of the logical model of a game, indicating two factors: (a) greater variety of interactions among participants is an input for the quality of the simulation; and (b) highly qualified players achieve better results in the game regarding the learning objectives than do less qualified players. Therefore, it is logical to expect that social learning between undergraduate and graduate students and interaction among students with different qualifications will positively impact the quality of the game, and hence of the learning process.

The article is organized into four more sections besides this introduction. The second section describes the theoretical framework, followed by discussion of the methodological aspects. Then the fourth section presents and analyzes the data and the last section contains our final considerations.

THEORETICAL FRAMEWORK

The theoretical framework is based on three main topics: description of business games and management labs, discussion of business games and social learning, and the relationship between undergraduate and graduate education.

BUSINESS GAMES AND MANAGEMENT LABORATORIES

Business games are widely used to develop the competencies of business administration students (Faria et al., 2009). A business game can be defined as an experiential environment with enough similarity to the real world that it can induce responses that would be applied in reality. It can also be characterized as a method used to create settings in which changes in behavior and learning can occur and where managerial behavior can be observed. In this sense, some business games are highly complex, integrating all management areas, while others are simple or functional, targeted at more specific areas of organizations (Keys & Wolfe, 1990; Faria et al., 2009).

One of the pillars supporting the use of business games for management education is the Experiential Learning Theory (ELT) of David A. Kolb (Oliveira, 2009; Ben-Zvi, 2010; Oliveira & Sauaia, 2011). In turn, the ELT was strongly influenced by other important theories of learning and human development, such as those of Paulo Freire, Carl Jung, Jean Piaget, Lev Vygotsky, John Dewey, Kurt Lewin, William James, Carl Rogers and Mary Parker Follett – in the search for a theory where experience has a central role (Kolb, 2015).

The ELT first of all involves the dialectic relationship between concrete experience and abstract conception, which enables the acquisition of experience. In the second place, there is also a dialectical relationship to transform experience by means of reflexive and active experimentation. The model generates a recursive and spiral process, so that the learner touches on all the mentioned aspects: concrete experience, reflexive observation and active experimentation. Within the context of learning, the ELT defines a process of building knowledge where the student experiments,

reflects, thinks and acts, in a cycle where concrete experiences serve as a base to observe and reflect, and from those reflections, to extract abstract concepts that can imply action. The action occurs when this implication is tested, generating the possibility of creating new experiences, in a continuous cycle of learning (Keys & Wolf, 1990; Kolb & Kolb, 2005; Oliveira, 2009; Oliveira & Sauaia, 2011; Hauge et al., 2013; Silva, Oliveira & Motta, 2013; Kolb, 2015). In this context, Kolb's cycle is depicted in Figure 1.

Therefore, the use of business games for management education fills a gap in the conventional learning dynamic, which is focused on the teacher rather than the student, allowing a link between theory and practice, and thus demonstrating the real utility of the theory. In this same logic, the use of business games for management education is supported by an extensive literature (Kolb & Kolb, 2005; Kriz & Hense, 2006; Faria et al., 2009; Ben-Zvi, 2010; Crookall, 2010; Station, Johnson & Borodzicz, 2010; Oliveira & Sauaia, 2011; Motta, Melo & Paixão, 2012; Hauge et al., 2013; Silva, Oliveira & Motta, 2013; Kriz & Auchter, 2016; Mrtvi et al., 2017; Hernández-Lara, Perera-Lluna & Serradell-López, 2018).

Figure 1 Kolb's Cycle
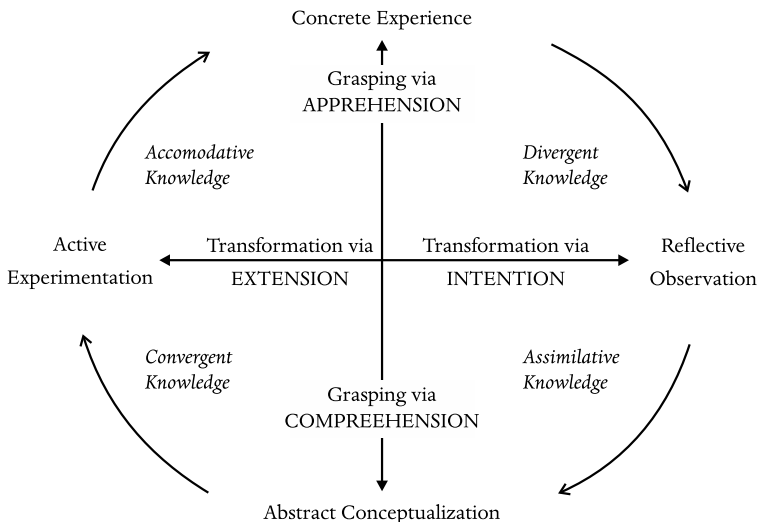
Source: Kolb (2015, p. 68).

In Brazil, the work of Professor Antônio Carlos Aldair Sauaia stands out (Oliveira, 2009; Oliveira et al., 2010; Motta, et al., 2011; Mrtvi et al., 2017) by developing the methodological proposal of the management laboratory. This proposal envisions the establishment of a teaching-learning venue where students can grasp the application of the fundamentals of management in controlled circumstances, which is one of the advantages of using business games for management education, since mistaken decisions made by the student will not cause damage to a real company. Therefore, the management laboratory rests on the conceptual tripod that includes organizational simulation, business gaming and applied research (Oliveira & Sauaia, 2011; Sauaia, 2013). It should be noted that the simulator is different from the game, because the simulator is the device by which the game is operationalized. In turn, the game is the experiential activity that allows making decisions under uncertainty and risk, interaction of the participants, and construction of relations between theory and practice, among others (Rosas & Sauaia, 2006; Sauaia, 2013). Furthermore, although business games have important advantages compared to conventional models, they cannot entirely replace expositive classes. Instead, the two approaches complement each other (Silva, Oliveira & Motta, 2013).

SOCIAL LEARNING AND BUSINESS GAMES

In developing a logical model to measure the quality of a business game, Kriz and Hense (2006) presented some questions that should be contained in a game for it produce the expected effects. Among the 50 parameters established in the study, due to methodological limitations we briefly examine two of them: achieving learning objectives and social learning.

Achieving educational objectives is a key factor for the development of knowledge by students. In this respect, Bloom's revised taxonomy presents a continuum of learning objectives, starting from the most elementary to the most elaborate, where the student is permitted to correlate the elementary objectives, already internalized, to achieve more complex goals (Hauge et al., 2013).

Although interaction of the participants is a classic variable in the application of business games, there are indications that social learning, which takes place by means of student-student relationships, is a leading factor, so the quality and intensity of these relationships are important variables for the successful application of the management experience. Also, the planning of how these interactions can occur and how they can influence the progress of the game can be designed during the construction of the logical model of the simulation. In this sense, the variety of interactions among the game's participants is associated with social learning (Kriz & Hense, 2006). Therefore, it can be perceived that the interaction and collaboration in a business game can be tied to the positive results in terms of learning (Lodders, 2013; Hernández-Lara; Perera-Lluna; Serradell-López, 2018).

The advantages of cooperative learning are perceptible in the development of group knowledge, the availability of cognitive models, as well as in cognitive conflict, which can result from social interaction. From this perspective, the social construction of knowledge is an instrument to activate individual cognitive processes that are important to understand, memorize and transfer new knowledge. The processes related to group learning consist of identifying gaps in individual and collective knowledge, increasing shared knowledge, developing abilities and meta-knowledge about a determined subject, developing social skills and motivational and emotional cohesion within the group, and integration of tacit knowledge (Friedrich, Hron & Hesse, 2001; Dolinska, 2017; Le Page & Perrotton, 2018).

In another panorama, the theory of social learning, developed by Albert Bandura, "stresses learning by experience, observation and imitation, and also perceives learning as a process developed in social interaction, so that people's actions are also influenced by the stimuli of their social environment" (Bandura, 1986, cited in Freitas & Godoi, 2008, p. 45). In this respect, social learning occurs as a result of social interaction or involving some type of social interaction, since people respond to their setting. Based on these influences, the construction of knowledge involves the interplay of cognitive and affective motivation, resulting in social construction (Lefrançois, 2016).

Based on the search for balance or its reestablishment, the individual constructs knowledge by means of others, because knowledge only makes sense when it is communicated and shared, so that social learning is found in others, in their backbone, be it through observation, interaction or experimentation (Godoi, Freitas & Carvalho, 2011). Both for Kolb and Bandura, learning needs to be experienced, and for the latter author, the emphasis of the learning process is on observation, and thus imitation, since the observation of an event that is modeled (by the teacher or another actor) can culminate in some type of performance by the observer (Lopes et al., 2013; Lefrançois, 2016).

In light of these multiple contexts, the importance of social learning for business games can be noted in terms of collective learning, capacity for innovation and performance of teams (Lodders, 2013). However, research is also a relevant factor in the management laboratory, and consequently for training in administration. Therefore, the next section examines the integration between undergraduate and graduate education as another aspect to enhance the quality of both levels of teaching.

INTEGRATION BETWEEN UNDERGRADUATE AND GRADUATE EDUCATION

Article 207 of the Brazilian Constitution of 1988 enshrines the principle of inseparability of teaching, research and extension. The literature on the integration between undergraduate and graduate education, although scarce, indicates that one of the strategies to articulate teaching and research is integration between undergraduate and graduate students. It also indicates that Brazilian universities often stray from the constitutional precept, by separating the activities of teaching, research and extension (Cury, 2004; Gomes, 2012; Rodrigues, 2012).

There is a lack of articulation between undergraduate and graduate education, with distinct objectives, located at different levels, inside and outside the teaching institution (Marafon, 2001). The distance is justified by the traditional structure of Brazilian higher education, where undergraduate programs are conceived as precursors for the propagation of the knowl-

edge that will serve as the basis for the work of future professionals, while graduate programs are focused on research and the systematic production of new knowledge, so that the effective integration between teaching and research in Brazil traditionally only occurs at the graduate level, including teacher training (Bertero, 2007; Nunes, 2007; Rodrigues, 2011; Valadão Junior & Rodrigues, 2012).

Furthermore, the development of graduate education in Brazil occurred under the influence of endogenous factors and/or meritocracy, and/or by focus on research detached from teaching, in a "parallel growth between the two sectors, where articulation consists of the action of teachers concomitantly at the undergraduate and graduate levels" (Marafon, 2001, p. 120). Another observation, presented by Cury (2004), is that the consolidation of graduate education has not always happened at the same time as the consolidation of the institution, or on the other hand, resulted from the enhancement of undergraduate education. All these factors mentioned in the literature influence this distance between undergraduate and graduate education.

Brazil's National Plan for Graduate Education (Brasil, 2010) indicates, as one of the strategies to meet the targets set for 2020, the practice of actions to expand graduate education, because the performance of the economy will depend crucially on the cohort of people with advanced degrees, due to the aging of the population and also the need to enlarge the critical mass of researchers. Therefore, it is necessary to implement strategies to give continuity to the learning of students who have concluded their undergraduate studies, because the expansion of graduate education will play an important role in the country's future economic performance.

Although research is a specific component of graduate education and teaching is the main focus of undergraduate education, both levels should be articulated, because through their nuances, planned ties and productions resulting from integration, "the university can gain greater legitimacy and benefit from the socialization of these levels of teaching, extending to society at large" (Cury, 2004, p. 791). Moreover, through greater integration of undergraduate and graduate education, the effects of the interaction

can be raised to the macro level, given the potential for production of benefits to society.

Specifically regarding administration programs, the National Program for Training of Administration Professors (PCDA) was launched in 2004, aiming to improve management education in Brazil (in line with the Fourth National Graduate Education Plan). It included projects and activities aimed at integration between undergraduate and graduate education in the process of training teachers. The joint efforts among the National Associate of Graduate Education and Research in Administration (ANPAD), the National Association of Undergraduate Administration Programs (ANGRAD) and the Office to Coordinate Improvement of University Personnel (CAPES), led to the offer of financing for so-called Pro-Administration projects, signaling the institutionalization and integration among agents regarding operationalization of the PCDA (Fischer, 2005; Freitas & Fischer, 2007; Silva, Oliveira & Motta, 2013). However, there are no reports in the Brazilian literature of the continuity of the program (Lourenço, Lima & Narciso, 2016).

Examples of integration are the successful experiences of articulation between undergraduate and graduate students through scientific initiation programs, where undergraduate students participate in scientific research, enabling them to develop their skills (Cury, 2004; Fernandes et al., 2015). However, this model is criticized in some quarters because it is only available to a small group of students rather than involving the entire academic community (Marafon, 2001).

The literature is not restricted to this model. Fernandes et al. (2015), in analyzing the evaluation reports of 35 graduate nursing programs for the period from 2007 to 2009, according to data presented to CAPES, identified some modalities of integration between undergraduate and graduate education, in particular a tutoring programs where the undergraduate students enrolled in scientific initiation projects receive tutoring from master's and doctoral students, establishing a means of interchange between scientific initiation projects and dissertation and thesis projects. The process was profitable, and some students published their studies in national and inter-

national periodicals. Another point of integration described was the Program to Improve Teaching, earmarked exclusively for graduate students to train them in teaching skills. This intervention was positively evaluated by the undergraduate students, because according to them the interaction promoted revitalization of curriculum components and sharing of working experiences of the facilitators, contributing to the training process and stimulating the students to participate in graduate programs, among other aspects.
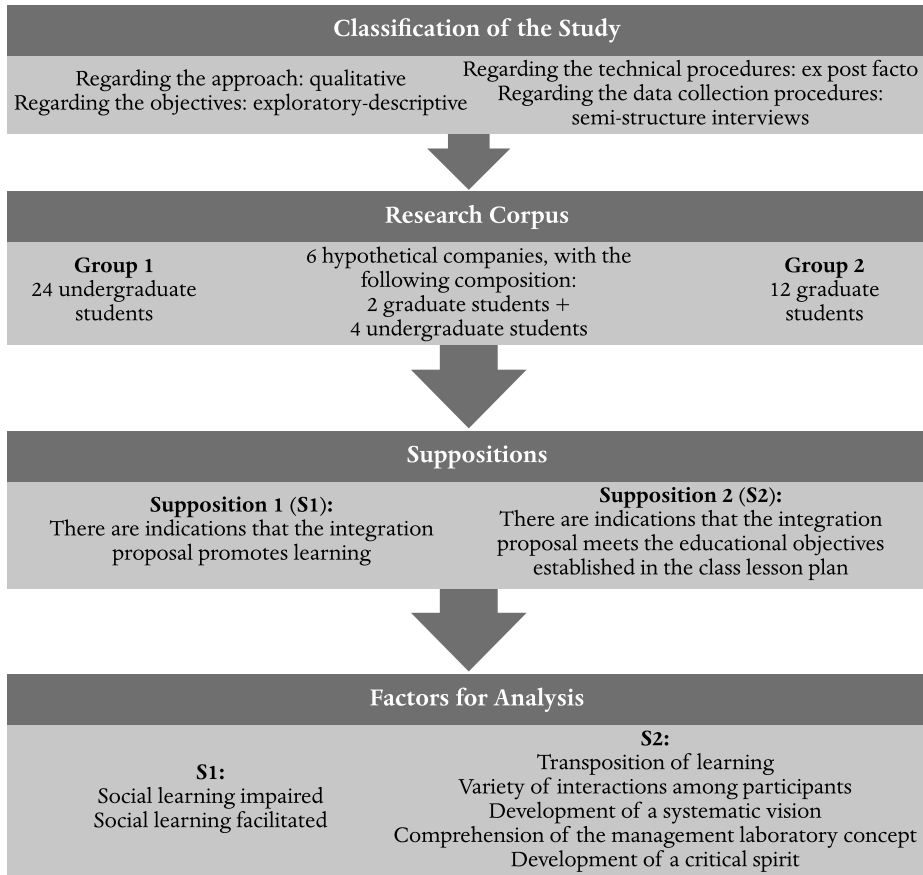
Programs to integrate students at different levels have been offered in the United States, for example, since 1988, where the experiences of undergraduate students derived from integration have been found to positively influence their decisions to pursue graduate study, and also to improve their performance in research (Hathaway, Nagda & Gregerman, 2002; Gilmore et al., 2015).

RESEARCH METHOD

This study is qualitative in nature, based on an exploratory-descriptive survey to investigate the factors involved in an experience, with the intention of understanding a determined phenomenon (the use of business games for integration between students at different levels). It systematically describes the main characteristics and behaviors of a determined research corpus, whose factors would have nebulous delineation in a quantitative study. By dealing with technical procedures, this study is also characterized as *ex post facto*, because the data were supplied by persons directly involved in a quasi-experiment and due to the impossibility of manipulating the variables, since the phenomenon occurred before the study was conducted. Therefore, since the discipline that integrated students of different levels in an experiential setting had already manifested its effects over time, we performed an investigation of the relations among the factors involved in the phenomenon (Silva & Menezes, 2005; Gil, 2008; Vergara, 2009; Cooper & Schindler, 2011; Richardson, 2012). Figure 2 depicts the research method.

More specifically, we investigated the interactions of students at different levels submitted to a business game, following the precepts of management laboratories, at a federal university located in the southern region of the state of Rio de Janeiro. Two groups of students were integrated in the program analyzed, one composed of undergraduate business students enrolled in a discipline called "Management Laboratory II" and the other formed by graduate students enrolled in a discipline called "Simulated Business Management", part of the Professional MBA Program. To play the game, six groups were formed, each one representing the executives of a hypothetical company, each composed of four undergraduate and two graduate students.

Figure 2 – Research Map

Classification of the Study		
Regarding the approach: qualitative Regarding the objectives: exploratory-descriptive		Regarding the technical procedures: ex post facto Regarding the data collection procedures: semi-structure interviews

Research Corpus		
Group 1 24 undergraduate students	6 hypothetical companies, with the following composition: 2 graduate students + 4 undergraduate students	**Group 2** 12 graduate students

Suppositions	
Supposition 1 (S1): There are indications that the integration proposal promotes learning	**Supposition 2 (S2):** There are indications that the integration proposal meets the educational objectives established in the class lesson plan

Factors for Analysis	
S1: Social learning impaired Social learning facilitated	**S2:** Transposition of learning Variety of interactions among participants Development of a systematic vision Comprehension of the management laboratory concept Development of a critical spirit

Source: Prepared by the authors based on Silva & Menezes (2005), Kriz & Hense (2006) and Vergara (2009).

The data were collected through semi-structured interviews follow-ing a script formulated according to the precepts indicated by Flick (2009), namely no steering, specificity, spectrum and depth. As also recommended by that author, the interviews were recorded and then transcribed in full, composing 26 pages. The interviews were structured based on the model of Kriz and Hense (2006), to elicit a description of the methodological pro-posal integrating students of different levels by means of business games, to identify the advantages and disadvantages of the process. In this respect,

we interviewed the mediator professor in charge of the program and 12 students (two from each team, one an undergraduate and the other a graduate student), forming the research corpus.

We used the logical model proposed by Kriz and Hense (2006) as the theoretical base to construct the suppositions and parameters for evaluation, because it is an instrument that allows assessment of business games, in particular the long-term results. A logical model should indicate how the game, its participants and setting interact to obtain the desired results. The model was constructed based on the science of analysis, which evaluates business games according to their uses and testing of theories, and on the science of design, which evaluates business games from the perspective of the usability of artifacts (Klabbers, 2003; 2018). Another relevant factor for choosing this model was the fact it was published in the leading periodical in the field and is widely used as a framework to assess business games (Mayer, Warmelink & Bekebrede, 2013; Kriz & Auchter, 2016).

The composition of our suppositions also followed the logical model proposed by Kriz and Hense (2006), according to which the interaction of the participants is a classic variable in business game applications. It also indicates that the social learning that occurs through the student-student relationship is an important factor, so that the quality and intensity of these relationships are variables that affect the success of applying the business game. These aspects formed the base of our first supposition.

With respect to the construction of the second supposition, Kriz and Hense (2006) established some criteria to determine the quality of logical models of games or simulations, and presented some variables that determine the quality of the process. For this study, we chose the following two criteria: (1) the variety of interactions among the participants as input for the quality of the simulation; and (2) the qualification of the players in obtaining results of the game (in relation to the learning objectives), whereby more qualified players obtain better results than less qualified ones.

Based on the second supposition, it is necessary to consider the learning objectives of the disciplines. Briefly, the general objective of the discipline "Simulated Business Management" is to present the management lab-

oratory idea as a method for management education, combining business games and applied research. The specific goals are to stimulate a systemic vision, to transfer learning and to develop a critical spirit. The objectives proposed for the undergraduate students are similar, but the method is substantially different (Oliveira, 2017).

After gathering the data, the next step consisted of analyzing them. We chose content analysis, which according to Bardin (2013, p.42) is defined as the "set of techniques to analyze communication, seeking to obtain a description of the content of communications, by applying systematic and objective procedures." This can involve using quantitative or qualitative indicators, to allow inferences of knowledge related to the mode of production and reception of each message.

To analyze the content we used categorical analysis, which "functions by operations to dismember the text into units, in categories according to analog regroupings" (Bardin, 2013, p. 153). The content analysis method has three phases: pre-analysis, exploration of the material and treatment of the results, as well as sub-steps (Bardin, 2013).

After transcribing the interviews, we used the ATLAS.ti® software to organize and classify the comments received, in an "operation of codification [...] based on previously formulated rules" (Bardin, 2013, p. 101). In this case, the rules pertained to some criteria determining the quality of a business game indicated by Kriz and Hense (2006), according the hypotheses of this study described in Figure 2. The findings are described and analyzed next.

PRESENTATION AND ANALYSIS OF THE DATA

The application of the business game lasted about two months, covering eight rounds. The teams were composed of two graduate students and four undergraduate students, with each team representing a company. The teams were classified as wholesale of manufacturing companies, whereby the three wholesalers negotiated freely with the three manufacturers, in an oligopolistic economic setting. The relations of the wholesale distributors with retailers and of the manufacturers with suppliers of raw materials were randomized by the computerized simulator.

At the end of each round, the companies received reports of their respective performances, influenced directly by the decisions made under risk and uncertainty, scored by the return on investment metric (ROI). Each student was responsible for a functional area of the company (planning, human resources, finance, marketing, operations and executive board), and at the end of the discipline, the students presented the results of their organizations as the main grading component, along with a technical report or scientific article based on the simulated organizational experience, making research an element for learning.

According to the interview with the mediator, the idea for integration between students of different levels derived from a movement for integration in the graduate program, because some undergraduate students who had performed well in the disciplines "Simulated Management Laboratory" I and II were invited by the mediator to take the master's level course called "Simulated Business Management" as an undergraduate elective. However, for the proposal of this study, the motivation started from the need to create a sufficient number of groups to form a competitive enviornment, as well as the need to provide the graduate students with an opportunity to experience how business games can be applied to teach undergraduate management students (in case they become teachers), and to meet the need to generate a large enough volume of data.

Table 1 Distribution of Frequencies of the Categories

Supposition 1	Freq.	%
Social learning facilitated	21	72,97
Social learning impaired	10	27,03
Total Observations	31	
Supposition 2		
Variety of interactions of participants	17	34,70
Transposition of learning	15	30,61
Development of a critical spirit	8	16,32
Development of a systemic vision	6	12,25
Comprehension of the management laboratory concept	3	6,12
Total Observations	49	

Source: Survey data.

For better visualization of the results, Table 1 presents the frequency distribution by categories and Figure 3 depicts the categories analyzed in more details, identifying the frequency of the contents declared by the interviewees about their respective companies (identified by numbers from 1 to 6 to preserve the anonymity of the students).

Table 1 contains the suppositions with the categories used. For Supposition 1, which involves social learning, the majority of the interviewees stated that the proposal for integration between the two levels facilitated learning through the relations among the participants (72.97%). With respect to Supposition 2, referring to the educational objectives of the discipline, the categories with highest frequency were those associating social learning to the variety of interactions of the participants (34.7%) and transposition of learning (30.61%). The other categories represented about one-third of the impressions of the interviewees.

These findings are in line with the theory, since teamwork is what will mediate the process of making decisions. In this respect, the students, in combining theory with practice, need to negotiate with the other executives of the simulated company so that their suggestion for applying a theoretical management technique can contribute to the success of the or-

ganization, since all decisions must be reached by consensus. On the other hand, when a student, more or less experienced, faces a particular situation in the game that is similar to the real world, he or she perceives an opportunity to share experiences and for observation by the other team members, some of whom may not have had this type of experience. In both cases, the members are involved in a cognitive conflict and at the same time collective construction of solutions, in which observation and experimentation play a fundamental role. For both ELT and social learning theory, these are important steps toward learning (Friedrich, Hron & Hesse, 2001; Kolb & Kolb, 2005; Godoi, Freitas & Carvalho, 2011; Lopes et al., 2013; Sauaia, 2013; Kolb, 2015; Lefrançois, 2016; Dolinska, 2017).

The relationship of these factors can be summarized in the comments of a graduate student of Company 5:

> We also perceive, as master's students, that...that we have information earlier, we also manage to perceive new things, and new points arise; ones that break our paradigms to some extent, which are actions that are even versatile; in more agile forms, which …reach a solution that we may have been foreseen, but it is …they are faster solutions. So, I found that...in relation to this, that it's also a gain…in spite of [our] experience, but we do not have experiences with new things, and the new is the future, isn't it?

Based on these comments, it is possible to perceive that social learning, especially when involving students of different levels, can facilitate learning when the students are searching for a solution to an organizational problem (Dolinska, 2017). Besides this graduate student of Company 5, eight other students had a positive perception regarding the social learning fostered by the experience. In this respect, an undergraduate student belonging to Company 2 stated that:

We,...the undergrads, all three undergrads of the team are freshmen, so for us it was a very interesting experience to be able to have closer contact with someone who is a teacher, someone who has more experience, someone who is studying for a master's, who has better knowledge,

perhaps even has publications in the area. It's really very interesting; we learn a lot.

In this sense, Kriz and Hense (2006) classify social interaction among participants as an essential variable for the application of business games. The reports of the majority of the students also indicate that social learning can occur through student-student relationships. Therefore, according to the authors, social learning is a relevant factor for the quality of a business game. Besides these factors, according to Godoi and Freitas (2008), learning happens by means of social interaction, and the situations and contexts are fundamental for this process, which also could be observed by the responses of this study. The positive relationships formed in the process of integration between graduate and undergraduate students observed here, although lacking depth, appears to jibe with the results of similar studies (Hathaway, Nagda & Gregerman, 2002; Cury, 2004; Fernandes et al., 2015; Hernández-Lara, Perera-Lluna & Serradell-López, 2018).

Our first supposition also elicited some negative reactions regarding social learning. In this respect, five students pointed to some difficulty of the integration of undergraduate and graduate students, such as an undergraduate student of Company 4 who stated that: "We perceived that the master's students in our class were very passive, in other groups they had computers, and were much more participative."

Besides this, a graduate student of Company 4 added:

> Because the two were segregated from the group, not only me, but the [other graduate student] as well. So,…I wanted to be more integrated; I could have contributed more especially because I have experience in a company so my vision is a bit broader. And I can say they wasted my potential and the potential of [the other graduate student], who is a really intelligent person.

It is important to note that of the five students who expressed discontent with the integration process, two belonged to the same team (their comments were transcribed above). This can indicate an internal misunderstanding in the group and an isolated situation within the experience.

In this context, the theory indicates that the quality of the interaction of the participants can affect the success of applying games. This can be associated with the below-average results obtained by that group (Kriz & Hense, 2006; Lodders, 2013). Nevertheless, there are indications that the performance in a business game does not have a direct correlation with significant learning, which in turn can occur irrespective of the game's result (Sauaia, 2006; Oliveira et al., 2010; Silva, Oliveira & Motta, 2013).

Figure 3 Frequency by Categories and Teams
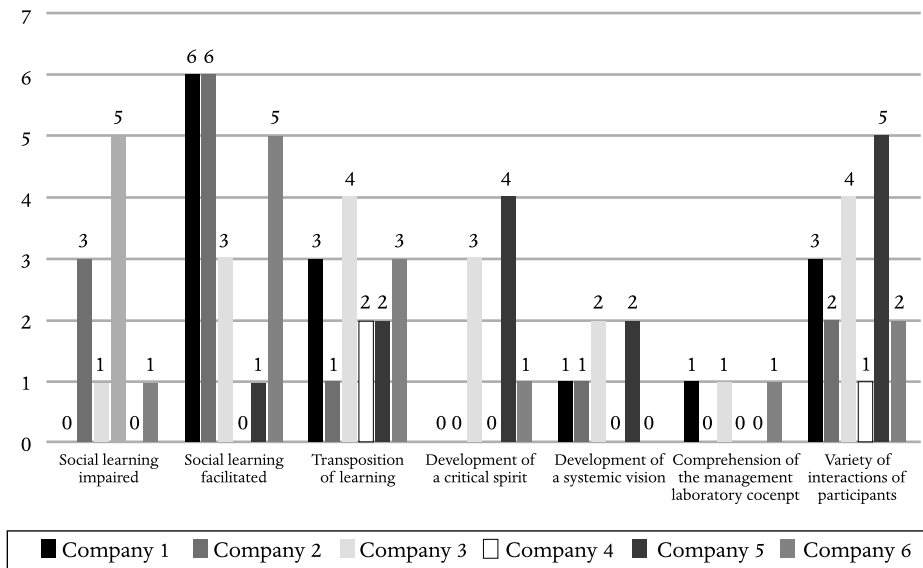
Source: Survey data.

An undergraduate student of Company 2 who demonstrated some dissatisfaction with the integration reported that the initiative and knowledge of the graduate students wound up stifling the activism of the undergraduate students. All the same, that student reported positive points of the integration, by saying that "the undergrads learned to rely on the master's student to make better decisions." Although acknowledging that the advantages of the integration outweighed the disadvantages, two other graduate students, from Companies 6 and 3, also reported negative points

of the integration, regarding the refusal of some of the undergraduate students to adhere to certain suggested strategies, and regarding the lack of protagonism of the undergraduate students, respectively.

It should be noted regarding this situation that this was an expected limitation of the process, since the interview with the mediator revealed that "in the expectation of having a more experienced student, he [the undergraduate student] could be a bit more relaxed at the time of making decisions,…but this happens in any group."

For the second supposition, we first analyzed the variety of interactions of the participants as an input for the quality of the game, which is related to social learning (Kriz & Hense, 2006). Regarding this characteristic, we classified as valid only the comments that assigned some type of value to an interaction that was different than expected for the game. In this sense, ten students (four undergraduate and six graduate students) expressed arguments that valued an interaction other than habitual ones with people in the game setting. Among these, we can highlight the comments of an undergraduate student of Company 1:

> It was a very interesting process. We were very enthusiastic to know there would be this connection, of meeting different people to be able to act with them, and to know this was the first time this had happened, that it didn't exist before. So, it was very interesting!

According to a graduate student of Company 1, this change in the composition of the game players was beneficial, and declared: "So, this integration between undergraduate and graduate students was valid, and I think it was even … a proposal of [the mediator] to assess whether this could be a model to be adopted."

With respect to the learning objectives of the discipline (part of the second supposition), transposition of learning elicited the largest number of observations (15 occurrences), by ten students (five undergraduates and five graduates). All of the statements indicated the perception that the theory was applied at some moment in the game, or that the experiences obtained in the game were useful in the real working world, which in

turn can reveal significant learning (Oliveira, 2009; Motta, Melo & Paixão, 2012; Hauge et al., 2013; Kriz & Auchter, 2016). Since the master's students might become teachers in the future and one of the objectives of a graduate program is to train people qualified to teach, the perception of attaining this educational objective is relevant, by pointing to the a need to think about undergraduate education in the sense of contributing to the learning process instead of just transmitting rote knowledge (Bertero, 2007; Valadão Junior & Rodrigues, 2012; Lourenço, Lima & Narciso, 2016).

The development of a critical spirit indicated as a learning objective during the game was mentioned in four interviews. Of the four students who demonstrated in their comments that they had developed a critical spirit in some way, two were graduates and two were undergraduates. The reflection of a graduate student of Company 5 illustrates this point:

> In this laboratory, I think that the number one contribution to being a positive practice is really this…, this closeness and also… the opportunity of your being seen as a student, as an apprentice let's say, and of knowing what deficient points you still have not observed, so I think this is a good opportunity of… of observing this, and in time seeking knowledge for yourself … better because sometimes you don't manage to map some points and in practice you manage to experience even the adversities that exist in the group.

Further regarding the specific objectives of the disciplines, five students reported that the game fostered the development of a systemic vision, the ability to see the organization as a whole, based on recombination of fragmented concepts in the teaching of theories (Oliveira, 2009; Sauaia, 2013). Of the five students, three were undergraduates and two were graduates. One of the leading perceptions in this question was from one of the undergraduate students, who referred to the management laboratory as providing "a moment that you experience the general aspects of a company in macro form."

Finally, the general objective of the two disciplines was to propose the use of the management laboratory concept as a method for manage-

ment education, combining business games and applied research (Oliveira, 2017). In this sense, only three graduate students' comments were classified as within this scope. This was the category with the fewest responses so classified in the entire study.

Figure 4 Map of Relations of the Factors for Analysis
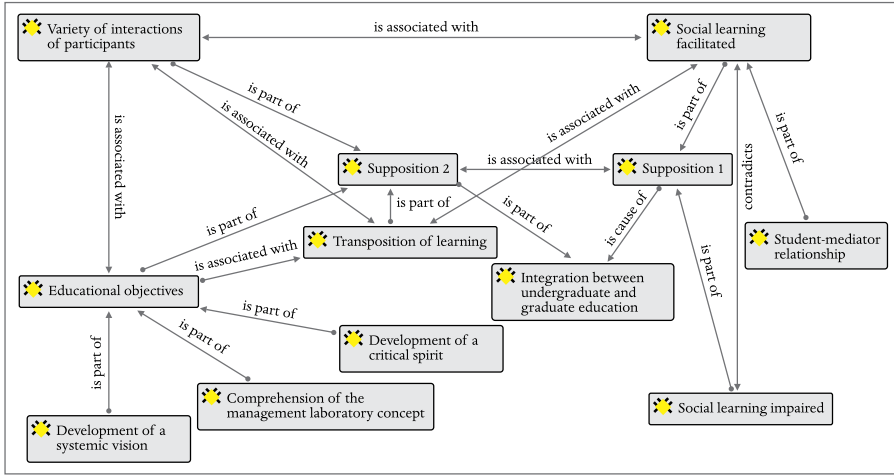
Source: Survey data.

On the matter of the learning objectives, the theory indicates that highly qualified players will achieve better results in the game than less qualified ones (Kriz & Hense, 2006). Based on the categorizations of the interviews, the graduate students had a higher response rate regarding the educational objectives than the undergraduate students. The standout was understanding of the management laboratory concept, which was correctly identified only by graduate students. This factor is important, because it indicates that the master's students, due to having more study hours under their belts and greater qualification, can be vectors of learning when integrated with undergrads (Fernandes et al., 2015).

Some positive considerations about the quality of the student-mediator relationship with respect to support and instruction emerged from analyzing the interviews. Although not delineated in the categories for

analysis, the dimension of the process designed in the logical model of Kriz and Hense (2006) encompasses the student-mediator relationship as also being a critical variable for the game's success. Finally, the content analysis, relying on the ATLAS.ti® software, generated a map that facilitates visualization of the interplay of the factors for analysis, presented in Figure 4.

FINAL CONSIDERATIONS

In response to the research question about the advantages and disadvantages of using business games to integrate undergraduate and graduate business administration students, the results suggest, as a chief advantage, that the central aspects of the experience are generally in line with the logical model of Kriz and Hense (2006), indicating that quality is interiorized in the management experience, and consequently in the process of integration and learning under analysis. Another important factor is the encouragement of research provided by the experience, which is a glaring need for Brazilian higher education, because one of the presuppositions of the management laboratory idea is to foster applied research (Cury, 2004; Oliveira, 2009; Oliveira & Sauaia, 2011; Rodrigues, 2012; Fernandes et al., 2015).

In this sense, indications can be observed that social learning was an important factor of the program, by enabling a larger variety of interactions among the participants, and that the process of transposing theory to practice was facilitated by the greater amplitude of the experiences of the students. In general lines, the learning objectives were better attained by the students with higher qualification, which suggests that graduate students can be vectors for learning in a process of integration. In this aspect, the two suppositions were confirmed, since social learning between undergraduate and graduate students and interaction of students with different qualifications positively affected the quality of the game, and thus of the learning process (Kriz & Hense, 2006).

On the disadvantage side, the integration experience was not satisfactory for two students. Nevertheless, these students belonged to the same team / company, and the comments of both indicated that that group was marked by segregation. This leads to the assumption there were cohesion problems on the team (a phenomenon that can happen in any group of people), which might have impaired the group's performance, since their economic results during the game were not satisfactory. From this context, in the case of a team where integration is impaired, either by lack of cohesion or some type of misunderstanding, the occurrence of social

learning will also be impaired, leading to performance that can be totally unsatisfactory. Nevertheless, for this case the results of the game should be considered with parsimony, since the performance in the game is not directly tied to significant learning (Sauaia, 2006; Oliveira et al., 2010; Silva, Oliveira & Motta, 2013).

Also on the matter of disadvantages, three students who mentioned some type of dissatisfaction with the integration also reported positive points of the integration for social learning, and indicated that the advantages outweighed the disadvantages. These findings support the objective of the study regarding comprehension of an educational proposal that integrates different teaching levels (undergraduate and graduate) by means of business games, to identify the pros and cons of the process.

The contributions of the study include the role of social learning in a business game on the implementation of a wider variety of interactions of the participants. This in turn can facilitate transposition of learning. The contributions also include aspects related to the benefits of integrating business students at different levels, with focus on management practice and research. Although the results do not allow concluding that the undergraduate students are more likely to pursue higher degrees, there are indications that the experience can instill in them some perceptions about the functioning of graduate education, as well as its potentials and challenges, reducing the distance between the two levels. So, the study contributes to the scanty debate about integration of undergraduate and graduate programs in business administration by discussing this process under the prism of business games.

As limitations, we can mention that the study covered only one experience, which prevents generalizations. Besides this, not all the students were interviewed: the sample was composed of 50% of the graduate students and 75% of the undergrads. Also, another variable tied to social learning, although emerging, was not evaluated in this study, namely the relative importance of the student-mediator relationship in the instruction and support dimensions (Kriz & Hense, 2006). A final limitation is the lack of scientific production in administration that encompasses integration be-

tween undergraduate and graduate students, and especially the integration of different levels by means of business games.

For future studies, we propose expanding analysis of the integration between undergraduate and graduate students via business games by interviewing all the students, to make the findings more consistent. We also suggest comparative studies between samples of students who participate in this type of program and those that do not. From another perspective, it would be interesting to correlate the method with theories that better explain the social learning phenomenon and teaching-learning methods at the two levels. We also suggest analyzing the long-term implications of integration, according to the effects on undergraduate students regarding pursuing higher degrees in comparison with undergrads not participating in integration programs.

Furthermore, since the scientific production produced by the students through use of the management laboratory during the experience was not examined by this study, we recommend analysis of the articles produced by students in similar programs regarding the processes of construction of knowledge (whether or not collaborative), as well as the learning processes. Other studies could also examine the use of business games as a teaching practice, since the "Simulated Business Management" class taken by the master's students (possible future teachers) also addresses the theoretical bases for the use of business games in management education. In this respect, the perception of master's students regarding the learning curve of the undergraduate students, in light of the Kolb cycle, can be investigated.

Finally, the gap between theory and practice, especially with respect to scientific research in administration in Brazil, prompts reflection on the need for better training of management professionals, since this need underpins the development of education in administration in Brazil, a substrate that is cause for shame when noting the possibility that the knowledge produced in academia has low relevance to practitioners. However, training good professionals, although explicit, is not the only function of the university. Rather, it is the diffusion of knowledge, to enable locating,

defining and contextualizing problems, translating the findings into a critical exercise articulated with other teaching levels, with other researchers, practitioners and research subjects. Based on this, the articulation between teaching and research, a presupposition of the management laboratory idea, combined with different teaching levels, can contribute to a more virtuous relationship between undergraduate and graduate education (Mascarenhas, Zambaldi & Moraes, 2011; Rodrigues, 2012; Sauaia, 2013).

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