



# Entrepreneurial attitude and conflict management through business simulations

Attitude and  
conflict  
management

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## Abstract

**Purpose** – The purpose of this paper is to elucidate the influence that participation in a simulation experience based on the automobile industry has on the entrepreneurial attitude (entrepreneurship attitude orientation) through conflict management learning.

**Design/methodology/approach** – The sample used in this paper consists of 427 advanced undergraduate students majoring in Business Management and Administration, Economics, Tourism and Research, and Marketing. The data are collected by means of a structured questionnaire.

**Findings** – Results show that the simulation experience increases positive results for personal control and self-esteem indicating that the participants applied the knowledge learned in the simulation improving their perception of control and conflict management approaches.

**Research limitations/implications** – The paper is focused on a business game based on the automobile industry in order to involve the participants into a realistic business management experience.

**Practical implications** – Results encourage the incorporation of these simulation tools into educational programs related to entrepreneurship. Business simulations improves conflict management within and between groups, especially in the complementary activities and negotiations with real agents, it also fosters motivation and cooperative attitudes.

**Originality/value** – This paper contributes to increase knowledge in conflict management for workgroups maintaining intensive and relentless relationships over a relatively long period of time in which the simulation develops. At a more practical level, experience on conflict management generates acceptance of the conflict as a part of the decisions making process, which improves the entrepreneurial attitude for all participants.

**Keywords** Entrepreneurialism, Simulation, Conflict management, Learning, Automotive industry

**Paper type** Research paper

## 1. Introduction

The concept of conflict has been object of analysis in diverse studies regarding the decision-making process within the firm. It has been considered as an element that fosters change and evolution in internal firm aspects regarding not only workgroups of functional areas but also relationships between them (Montoya-Weiss *et al.*, 2001). Hence, conflict configures the dynamics of organizational teams for the workgroup members to confront when individual interests differ in situations when common objectives need to be achieved (Desivilya and Eizen, 2005). One of these situations refers to the development of new business projects (González-Alvarez and Nieto-Antolin, 2005). In this context, the concept of entrepreneurship has been an object of special



study in recent years (Zeithaml and Rice Jr, 1987; Vesper, 1988; Steyaert, 1997; Carter, 2004). Entrepreneurship is a broad concept applied to such disparate situations that it is advisable to analyze its origins, classify the main lines of study, and determine its application to different environments defined by different socioeconomic factors (Brockhaus Sr and Horowitz, 1986; Krueger *et al.*, 2000). Literature has paid special attention to the entrepreneur's attitude as the most effective indicator in identifying the emergence of future entrepreneurs.

The use of simulators in the field of managerial decision-making training in firms is currently widespread in university instruction and business schools (Moratis *et al.*, 2006). Firms are also making increasing use of simulators, applying them not only to their internal decision-making processes but also in internal training of their managers (Thompson and Stappenbeck, 1997; Walters *et al.*, 1997). Entrepreneurship skills and attitudes can be trained through business simulations experiences. Different studies performed on the effectiveness of simulators in teaching-learning processes has shown very encouraging results, not only in what is called absorption and implementation of knowledge but also in the positive repercussions of simulator application on different factors related to motivation, performance and conflict management (see, among others, Thompson and Stappenbeck, 1997; Miles *et al.*, 1986; Lane, 1995; Arbaugh, 2000; Rulke and Galaskiewicz, 2000; Rachman-Moore and Kenett, 2006). The simulated sector plays a fundamental role according to its degree of competitiveness, dynamism or innovativeness. Hence, the automobile industry represents one of the most complex firm structures which enable potential entrepreneurs to manage elaborated decisions to experience realistic strategic management challenges for competition.

This study is designed to elucidate the influence that participation in a simulation experience generates on the entrepreneurial attitude through conflict management. This influence is analyzed through the development and subsequent empirical verification of a model based on the nature of the simulation and the group dynamics to solve internal conflicts. Hence, we attempt to respond to different lines of research suggested in prior studies that show the importance of including conflict management in the study of entrepreneurial attitudes (Jiwa *et al.*, 2005). However, the major contribution of this study is related to the application of business games to analyze such interrelation. The main findings of this research contribute to increase knowledge in conflict management for workgroups maintaining intensive and relentless relationships over a relatively long period of time in which the simulation develops. At a theoretical level, negotiation with external agents in a competitive environment expands the possibilities of experimental research and helps to understand the basis to put previous knowledge into practice in order to solve conflicts in a constructive way in contrast to a destructive approach. At a more practical level, experience on conflict management generates acceptance of the conflict as a part of the decisions-making process, which improves the entrepreneurial attitude for all team members. In this background, the contextualization of this study in the use of new information and communications technologies, specifically in the area of virtual simulators of entrepreneurial decision making in the academic environment constitutes an ideal link to analyze the importance of entrepreneurial attitude as a trigger for the emergence of the entrepreneur (Venkatesh and Davis, 2000; Curry and Moutinho, 1992).

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## 2. Foundations of the research

Conflict management studies regarding interrelationships among different economic agents tend to focus on experimental negotiations based on simulations. In most cases, all individual interests are oriented towards the achievement of specific goals regarding a determined task. Once the task is finished, there are no further bonds that keep the group together or at least uphold any kind of relationship. However, in simulation games experiences, groups of participants are formed to create virtual firms that compete among them in an emulated environment. In this case, the firm teams share goals, tasks, knowledge and outcomes for a long period of time as the simulation takes place. Hence, interdependence among all members of every team creates a strong group sense of identification fostered by competition (McGrawth, 1984; Ajzen, 2001).

This situation is similar to those in which a group of entrepreneurs join to develop a new firm project. Different conflicts of interest emerge as individuals offer different point of views on the ample range of decisions to be made when starting a new firm. A deep knowledge of the advantages and disadvantages of cooperation vs bargaining increases notably the skills and abilities to manage conflict efficiently in order to get to the optimal solution fast and reliably. University students can be trained on conflict management through participating in business simulations focusing on conflict management issues. Participants can evaluate whether their practice helped them to get to deals in a more efficient way while increasing their negotiation capabilities. These skills are crucial to foster entrepreneurial attitude of the participants, which represents the main focus of analysis for this study.

Firm simulators can be used to simulate specific processes (industrial, administrative, etc.) as well as business decisions (Faria, 2001). The latter are usually called business games, as they enable simulation of firm management in its totality, simulating the firm's activity over various periods of times (Segev, 1987). In this respect, the present study develops and verifies a model that includes the factors that influence entrepreneurial attitude and conflict management through participation in a business game based on the specific sector of the automobile industry. Participating in a simulation experience generates a learning process that goes beyond the mere absorption and generation of knowledge in the complex environment of a global operations of the automobile sector (Rulke and Galaskiewicz, 2000). The main basis of this is study is that group work, delegation of tasks and conflict management in the framework of the simulation experience promotes attitudes favoring management and development of an entrepreneurial project.

There are different kinds of computer simulators. In this research, it was required that the simulation experiences allows participants to put into practice the teaching-learning processes as well as the knowledge about management of an advanced university undergraduate. The reference of the requirements of the simulation tool was for the body of basic knowledge (CBK) published by the American Assembly of Collegiate Schools of Business (Eldredge and Galloway, 1983). Therefore, the simulator used had to satisfy the following minimum requirements:

- Include decision making in all of the functional areas of the firm, so that participants can have a global vision of the decision-making process and the interrelation between the different areas.
- Simulate a specific, real entrepreneurial sector familiar to the participants, in order to make the experience as close as possible to reality in an international context.

- Generate competition between firms and not compete with the simulator, as the simulator is an instrument but does not participate as an agent in the industry or the economy.
- Ensure that the results of the decision-making process come not only from the interrelations between the different functions of each firm but also from the decisions made by the industry as a whole. Thus, each firm depends not only on its own decisions but also, as in real life, on the decisions made by competitors.

Some of the simulators used most widely in European and North American business schools are *The Business Strategy Game* (Thompson and Stappenbeck, 1997), *Corporation* (Smith and Golden, 1994), *Praxis-MMT* (Arias-Aranda, 2007), and *Capstone* (Mitchell, 2006). In this study, the Praxis-MMT simulator, v. 10 was chosen as it fulfilled the requirements described above for the automobile industry including international markets operations and marketing as well as logistic, financial, operations, and human resources decisions.

The main goal of the current study is to determine the factors that influence the entrepreneurship attitude according to the management of internal conflict through a business game. Consequently, a model that includes the different dimensions of entrepreneurial attitude and conflict management is empirically tested in the context of a business simulation of the automobile industry (Lant and Mezas, 1990; Zantow *et al.*, 2005).

This main goal will help to increase understanding of those factors that turn participation in simulations into an instrument to improve understanding and knowledge of the decision-making process in the firm through conflict management and thus to influence the entrepreneurial attitude of the participants (Garavan and O'Conneide, 1994). This issue has special importance, as simulators are being increasingly used in training managers and business management students. Its application in the area of entrepreneurship requires rigorous study based on the existing theoretical contributions (Martins and Kellermanns, 2004). Hence, this paper introduces the simulation environment as a key element to analyze conflict and entrepreneurial attitude, demonstrating the considerable scope that exists for improving and managing such attitudes through the use of computer supported cooperative learning tools in a simulation experience (Romano *et al.*, 2005). The study is structured as follows: first, we present the theory and hypotheses. Then, we describe the methodology and results. Finally, we develop conclusions, both for managers and for the scientific community, while also presenting the study's limitations.

### 3. Theoretical review

#### 3.1 Conflict management modes

Literature on conflict management has identified a variety of behaviors showed by workgroup individuals when managing conflicts (Poole *et al.*, 1991; Sambamurthy and Poole, 1992; Arias-Aranda and Molina-Fernández, 2002). In this context, Rahim (1992) and Thomas and Kilmann (1974) outline five conflict handling modes that describe conflict management in organizational work groups: avoidance, accommodation, competition, collaboration, and compromise. Individuals with a competitive behavior in conflicts show criticizing behaviors of those with opposing interest within the conflict, use of threats to gain advantage and defend own interests under a competition

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framework, information disclosure of strategic information about oneself and suggestion of possible elucidations to the conflict forcing own views on others. On the other hand, those individuals avoiding dispute tend to defer and avoid any confrontation sources of the conflict itself. The collaboration handling mode is associated to a cooperative and collaborative trend in the individuals' behavior in order to solve the conflict while maintaining and even reinforcing the relationships with the rest of the group by considering the interests of all parties. The compromising behavior is characterized by a relatively deep analysis of own and other's positioning on the conflict in order to settle a possible solution in an intermediate field which may satisfy the group as a whole. Finally, accommodating individuals feel compelled by the goals and interest of others and tend to acquiesce with the solution adopted by the group, independently of his/her own interests.

In this study, the patterns followed by the participants in a business simulation regarding these conflict handling modes are the basis for analyzing whether the participation in a business simulation experience involves a trend on the participants conflict management modes towards a compromising/collaborating pattern, which also generates one the crucial skills of entrepreneurs when handling controversies with associates. Previous studies have analyzed these patterns on global virtual teams (Montoya-Weiss *et al.*, 2001). Specific conflict management patterns are followed by different individuals. This model entails five behavior outlines for managing conflicts within the workgroup. The collaborating and compromising patterns involve conflict engagement, while avoiding, accommodating and competing are reactions for either eluding conflicts or impose personal criteria on possible workgroup agreements. In addition, the avoiding and accommodating and competing patterns tend to be destructive on the relationships as they do not take into account the rest of the individuals concerns compared to the inherently constructive nature of the collaborating and compromising patterns which consider all concerns to reach to a shared resolution of the conflict.

### *3.2 Simulation as a teaching-learning tool*

The use of simulators in teaching firm management has been the subject of numerous studies (see, among others, Curry and Moutinho, 1992; Moratis *et al.*, 2006; Miles *et al.*, 1986; Faria, 2001; Jiwa *et al.*, 2005). As computer-supported cooperative learning tools (Romano *et al.*, 2005), simulators enable decision making in an environment that simulates real environments. They are thus useful for developing and strengthening managerial abilities. Specific literature has also analyzed how active learning influences motivation of business games participants (Asakawa and Gilbert, 2003). Participants are the only responsible for their decisions so instructors many times become mere observers (Segev, 1987; Arias-Aranda, 2007). The participants thus gain first-hand knowledge of the results of their actions and the extent to which their action-decision guidelines are effective. Many studies find the use of simulators to be more effective than the case method in fostering active learning (Cohen and Ledford Jr, 1994; Lainema and Makkonen, 2003; Abad-Grau and Arias-Aranda, 2006).

The simulation experience requires the development of group dynamics in order to generate cohesion in the groups, especially in the early stages of the simulation. It is important that the groups are conscious of belonging to an entrepreneurial project that requires a specific level of effort and responsibility on their part, particularly toward

their teammates. Thus, a phenomenon of self-monitoring occurs in the team itself that will demand responsibility from those members who diverge from the team's general behavior or reduce their level of effort, acting as "free riders" (Devine, 1999). In this respect, the literature has identified a significant relationship of group performance, among other variables of group character, to the capacity for conflict resolution and degree of trust among the members (Jehn, 1995; Partington and Harris, 1999). In the simulation, learning occurs on the individual level, that is, each participant acquires and generates new knowledge in the course of the simulation experience. This knowledge and learning can be produced differently in each member of the group, although the team's result is the same for all of the components. Further, the team's results are available once the simulation is over and can be compared to those of the other teams. However, to contrast the acquisition of new knowledge, some test to evaluate or measure the knowledge and thus find some indicator that shows that the process has been effective is required.

### *3.3 Entrepreneurship*

Most studies on entrepreneurship analyze entrepreneurship results, reasons, and methods (Stevenson and Jarillo, 1990). The first category is framed by the well-known analyzes of Schumpeter (1934), Kirzner (1973) and Casson (1982). The second category can be defined by the psychological or sociological approach and originates in the work of McClelland (1961). This perspective emphasizes the entrepreneur as individual, analyzing the factors that configure the entrepreneurial attitude in specific environments. Under this approach, the fundamental goal of analysis is to understand the entrepreneurial character. In the third and last category, researchers analyze the different characteristics of the entrepreneurial action based on the entrepreneur's capacity to achieve its goals and managerial techniques. Thus, the intention to become an entrepreneur depends on the known as "entrepreneurship attitude" (Ajzen, 1991). The more favorable this attitude, the greater becomes the possibility of the individual to assume entrepreneur-like behavior. This approach generates study of entrepreneurship from the perspective of the attitude prior to this kind of behavior (Robinson *et al.*, 1991). Attitude is defined as the degree to which a person evaluates something positively or negatively (Ajzen, 2001; Shaver, 1987), being this attitude is relatively stable but able to change depending on specific circumstances. Attitude can be understood as a general or specific predisposition that can be directed to different levels of performance (Ajzen and Madden, 1986). Therefore, measuring orientation to the individual's entrepreneurial attitude, varies according to demographic factors that surround the individual and specific characteristics of individual personality (Rosenber and Hovland, 1960; Shaver, 1987).

When trying to predict entrepreneurial conduct, scales that measure the orientation of an individual or group of individuals toward the kind of prior attitude that denotes future entrepreneur-like behavior are required (Robinson *et al.*, 1991). There are two approaches in the study of entrepreneurial attitude. Some studies consider it to be a one-dimensional construct derived from a personal affective reaction (Fishbein and Ajzen, 1975). The other, known as the tripartite model, is based on the idea that there are three kinds of reactions – reactions of affect, knowledge, and will. In this last approach, attitude is the combination of these three kinds of reactions (Shaver, 1987; Allport, 1935) and can be defined in the following manner: the affective component

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refers to the positive or negative emotions that someone holds toward something; these are the object of the individual's attitude toward that thing. The cognitive component, or component of knowledge, consists of the individual's beliefs and thoughts based on this attitude. Finally, the component of will relates to the intentions and predispositions toward a specific behavior directed to whatever may be the object of a specific attitude.

Regarding validated scales based on attitude to entrepreneurship, Robinson *et al.* (1991) developed the entrepreneurial attitude orientation (EAO). Also, the scale that measures entrepreneurial opportunity recognition (EOR) was developed by McCline *et al.* (2000). The EOR scale adds measurements related to risk assumption and the recognition of opportunities with respect to the EAO. Given that the perception of risk in simulation experiences is manifestly different than that in real entrepreneurship experiences (the individual reduces the perceived risk, as he or she is not risking personal assets or his or her own profits), the EAO scale fits better for this study. The EAO scale is based on analysis of personal characteristics that define the entrepreneur and has been applied in similar studies (Gartner, 1990; Collins and Moore, 1970; Brockhaus, 1975). Based on these characteristics, it identifies four constructs associated with entrepreneurial motivation and research on the term "entrepreneur": need for personal achievement (McClelland, 1961), need for control (Levenson, 1973), self-esteem (Crandall, 1973), and innovation (Kirton, 1984). Self-esteem includes a person's subjective appraisal of himself or herself as intrinsically positive or negative to some degree. Like achievement motivation and personal control, self-esteem has been viewed as one of the most effective predictor, of future performance (Jones and English, 2004). From here, the following subscales associated with entrepreneurship are developed (Robinson *et al.*, 1991):

- Business success: results associated with the creation and establishment of a business.
- Business innovation: associated with the development of innovative and unique business activities.
- Personal control of the results obtained: perception of the control or influence over one's own business.
- Personal achievement through business: understood as personal confidence and the individual's perceived competence.

#### 4. Development of the hypotheses

In the business game, participants know the results of their decisions prior to make the decisions related to the next period. This allows participants to analyze the evolution of the decision-making process over the entire simulation. This general vision of the overall development of the virtual entrepreneurial project for which they have been responsible, as well as the possibility of analyzing the same evolution for the case of the competitors (once the simulation is over), generates learning from the theoretical ground to real practice (Arbaugh, 2000). Thus, participants have to manage conflicts considering all concerns from the individuals belonging to his/her workgroup. The direct relation between learning based on theory and the putting into practice of this knowledge, along with the virtual firms performance, generates new knowledge that strengthens and stimulates the internal decision-making process (Zantow *et al.*, 2005) under a compromising/collaborative pattern. The new generated knowledge

decreases risk aversion, which influences positively the potential for innovation (Hofstede, 1993) and the generation of new ideas. In fact, the continual need to solve problems by considering not only the firm's current situation but also the decisions that might be made by its competitors fosters the development of innovative solutions (Jehn, 1995; Jehn and Mannix, 2001). Further, fostering competition in business games and the development of complementary communication activities with other agents in the economy (consumers, shareholders, competitors, etc.) as well as the need to negotiate the implementation of strategic politics with real agents (retailers, banks, chief executive officer (CEO), etc.) stimulates the participants to react to the environmental conditions in innovative ways (Partington and Harris, 1999).

Work groups created in the simulation encourage the perception of collectivity. This perception increases competition between firms is stimulated. In turn, management of internal decision-making conflicts influences the group's cohesion (Redpath and Nielsen, 1997). The division of responsibility and the internal delegation of tasks or decision-making by functional areas become functional instruments for ensuring that each member of the group is aware of his or her competences (Cohen and Ledford Jr, 1994). However, the communication needs to be constant and fluid, as many decisions transcend individual competences, while others influence several functional areas at a time (Jehn *et al.*, 1999). The level of commitment that a simulation experience demands from the participants is very intense. The quantity of information to process, as well as the large amount of time devoted to making decisions, not only in individual areas of competence but also arriving at substantial agreements with the other members of the group on corporate decisions, requires that the participants improve their managerial abilities (Devine, 1999; Bandura, 1997). The group's cohesion affects the self-confidence of the participants as the simulation progresses. The conflict with competitors also influences self-confidence positively to the extent that the members of the same group support each other and try to defend their positions against the competition (Zantow *et al.*, 2005). Therefore, and according to the previous background, the following hypotheses are established for further research:

- H1.* Participation in a simulation experience has a positive and significant effect on the participants' conflict management modes towards a compromising/ collaborative pattern.
- H2.* Participation in a simulation experience has a positive and significant effect on the business success, business innovation, personal control of results obtained, and personal business achievement.

## 5. Methodology

A questionnaire was used to gather data from participants and non-participants students in the simulation. The sample used in this study consists of 427 advanced undergraduate students majoring in Business Management and Administration, Economics, Tourism and Research, and Marketing at the University of Granada. Of these, 224 had participated in the simulation experience in work teams during the academic courses ranging from 2005 to 2008. Each team was formed of five to seven students, who dedicated a full month to the simulation, combining it with classes in their respective majors. The time per team devoted to the simulation averaged 20 hours per week, including the negotiations with real agents (retailers, bankers, and CEOs)

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and complementary activities (presentation of firms, communication contest, product fair, and general meeting of shareholders). The teams met freely at times and places that they determined to deliberate and make the decisions at each stage. The simulator chosen, Praxis MMT v.10, required the students to manage a manufacturing firm in the automobile sector in an industry composed of a total of six firms. The firms operated in six different markets and could choose where to locate their plants and establish commercialization networks for their products. The number of decisions to be made in each period numbered more than 500 in all of the functional areas of the automobile firm (logistics, human resources, finance, operations, sales, marketing, etc.). A professor acted as director of the simulation, his or her main role being to solve technical and organizational problems if they arose. None of the participants had previous knowledge on simulations and had not previously participated in any simulation experience as reported by them. The questionnaires were filled up right after the end of the simulation experience.

For the empirical analysis, the independent variables incorporated in this questionnaire were those from the scale on EAO developed by Robinson *et al.* (1991) containing 75 variables. For these cases, a Decile scale was used to ensure reliability and increase the range of sensitivity as university students in Spain are used to be evaluated on a one to ten points basis. This numbering system is undoubtedly the most intuitive and easy to conceptualize. Peabody (1962) argued that agree/disagree scales should simply be scored dichotomously according to the direction of response. This was based on his finding that, when people responded to attitude scales, a “composite score” derived by combining direction of response (agree or disagree) with the intensity of response (extent of agreement or disagreement) was dominated by the former. It may be reasonably concluded that increasing the response options beyond seven-points does not systematically detract from scale reliability, a conclusion shared by others (Russell and Bobko, 1992). So, since many people will have a discriminative capacity that exceeds seven points, restricting people to such scales results in a loss of potentially discriminative data. The end-defined format seems not to bias the data in any particular way. It is also interesting to note that an increasing number of recent authors (Hooker and Siegler, 1993; Watkins *et al.*, 1998) are using ten-point end-defined scales. Scale sensitivity becomes a critical concern since this construct has a high-trait component, and small deviations are highly meaningful. For measuring the five conflict-handling modes that describe conflict management in organizational work groups (avoidance, accommodation, competition, collaboration, and compromise) the scales developed by Montoya-Weiss *et al.* (2001) have been applied with a one to five-points Likert scale as the degree of sensitivity required is lower and this scale is easier for students to apply when they are used to the Decile scale.

## 6. Results

Statistical tools such as factor analysis, correlations, means, grand means, standard deviations, analysis of variance (ANOVA), and multivariate analysis of variance (MANOVA) were used for the analysis of the data gathered. Principal components analysis was used to reduce the data. Before applying the factor analysis, it was tested that factor analysis was appropriate to apply on this data, using statistical tests like Kaiser-Meyer-Olkin (KMO) and Bartlett's test of sphericity. The first one is a measure of sampling adequacy, where a value greater than 0.5 is desirable (Hair *et al.*, 2001).

The second one is used for testing the appropriateness of factor analysis showing variables are uncorrelated in the population (Malhotra, 2005). The approximate  $\chi^2$  two-square statistic was 1,845.765 with 78 degrees of freedom, significant at the 0.000 level. The value of the KMO statistic (0.593) was also large (0.5). Thus, factor analysis was considered as an appropriate technique for analyzing the correlation matrix. The results of the factor analysis were further analyzed by applying ANOVA, which bring out the significant differences among various categories of respondents and means and grand means, used to assess the extent and the direction of the differences. Regarding MANOVA, this technique was used to identify the interactions among the independent variables and the association among dependent variables.

Table I presents the descriptive statistics and their correlations. To ensure that there was no correlation between any of the predictor variables, we tested for possible multicollinearity, calculating the variance inflation factor for all of the predictor variables ( $FIV = 1 - R^2$ ). A value of 5.83 was obtained. Values below ten decrease the possibility of multicollinearity (Neter, 1989). An analysis of the convergent and discriminant validity of the measurements through an analysis of the correlations (Tables I and II) was performed with positive results. Cronbach's alphas were also calculated with values higher than 0.6 for all scales.

The average point-values for the groups of students who participated in the simulation experience and for those who did not are shown in Tables I and II. To verify

Group	Achievement	Control	Innovation	Self-esteem
Simulation experience	8,539	7,850	7,339	7,116
No simulation experience	6,938	5,863	6,028	6,878
<i>Simulation vs non-simulation groups</i>				
<i>t</i> -value	15.83	22.31	10.12	2.63
Significance level	0.000	0.000	0.000	0.000
MANOVA Wilks' lambda	0.783	0.773	0.703	0.638
<i>F</i> to eliminate	14.395	12.942	12.136	11.946
Cronbach's alpha	0.78	0.81	0.69	0.71

**Table I.**  
Average point-values and  
MANOVA test (I)

**Source:** Own processing

Group	Avoidance	Accommodation	Competition	Collaboration	Compromise
Simulation experience	2.184	3.285	3.789	3.842	3.967
No simulation experience	2.846	2.629	2.074	3.146	2.864
<i>Simulation vs non-simulation groups</i>					
<i>t</i> -value	5.833	6.895	14.465	7.284	10.475
Significance level	0.000	0.000	0.000	0.004	0.000
MANOVA Wilks' lambda	0.713	0.723	0.753	0.718	0.721
<i>F</i> to eliminate	12.324	12.543	12.432	12.458	12.496
Cronbach's alpha	0.81	0.79	0.68	0.83	0.69

**Table II.**  
Average point-values and  
MANOVA test (II)

**Source:** Own processing

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the hypotheses, a student's *t*-test was used. These values, as well as their significance level, are also shown in Tables I and II. In all of the subscales, the students who participated in the simulation experience scored higher than those who did not participate in all variables except for Avoidance as conflict management behavior. The largest difference appears in the subscale for control (1.987) and the smallest one in the subscale for self-esteem (0.238) (all the significance levels being of  $p < 0.0001$  except that for self-esteem with  $p < 0.004$ ). The analysis of the data indicates a significant difference between the values for the different items on the questionnaire in all of the subscales when comparing the participating group with the control group. These differences are also statistically significant. Nevertheless, MANOVA test was performed in order to verify the differences between the two groups. Although each of the subscales alone discriminates between both groups, the combined use of the four subscales shows greater robustness than any alternative discriminant function. The predictive value of the subscales is verified through the discriminant analysis based on the Wilks' lambda. The four scales contribute positively to the discriminant function with a lambda value of 0.628 and 84 percent precision in power of discrimination. Thus, the results show a significant increase in the point values in all of the subscales for the students who participated in the simulation experience. These results verify positively *H1* and partially *H2*.

Through a multiple regression, an analysis of further sub-questions of each measured dimension (achievement, control, innovation, and self-esteem) to understand what kind of different sub-areas establish better ground to perform for those students which have experience from simulation, was performed (Table III). The purpose was to clarify the relationship between the different independent variables with one particular dependent variable. In order to ensure basic requirements for performing the regression, linearity among variables, distributions normality and homocedasticity were analyzed. Linear relations among variables are examined through dispersion graphics. A linear relation is detected among dependent and independent variables. Regarding homocedasticity, distributions graphics did not show associations between residuals and predicted values. The regression analysis shows higher values in the relationships between entrepreneur attitudes and competition, collaboration and compromise dimensions of conflict management (Table IV).

## 7. Discussion and conclusions

Individuals belonging to workgroups that participated in the simulation experience score significantly higher in all those conflict management handling modes that reinforce internal relationships within the team (collaboration and compromise) with considerable differences with non-participants. Results show that the simulation experience increases the trend to behave in ways that keep the group in cohesion when managing conflicts. However, the accommodation and competition dimensions score higher in simulation participants as well. The learning process in which simulations participants are immersed allows them to experiment different approaches to conflict resolution. On the other hand, students with no simulation experience tend to position towards the extremes, either avoidance or compromise, as pressure to solve conflicts diminishes in comparison to business simulation. Tasks such like preparing materials involve much less-substantial conflicts than preparing a budget for next year expenditure in the firm communication strategy in the simulation. Only avoidance gets

**Table III.**  
Multiple regression  
analysis

Variable	Avoidance		Accommodation		Competition		Collaboration		Compromise	
	Model 1 B (Tip Er)	Model 1 B (Tip Er)	Variable	Model 1 B (Tip Er)	Variable	Model 1 B (Tip Er)	Variable	Model 1 B (Tip Er)	Variable	Model 1 B (Tip Er)
Constant	5.403 <sup>***</sup>	5.419 <sup>***</sup>	Constant	5.419 <sup>***</sup>	Constant	5.409 <sup>***</sup>	Constant	5.412 <sup>***</sup>	Constant	5.434 <sup>***</sup>
Achievement			Achievement		Achievement	0.084 <sup>***</sup>	Achievement	0.088 <sup>***</sup>	Achievement	0.084 <sup>***</sup>
Control			Control		Control	0.124 <sup>***</sup>	Control	0.121 <sup>***</sup>	Control	0.137 <sup>***</sup>
Innovation			Innovation		Innovation	0.116 <sup>***</sup>	Innovation	0.125 <sup>***</sup>	Innovation	0.113 <sup>***</sup>
Self-esteem			Self-esteem		Self-esteem	0.107 <sup>***</sup>	Self-esteem	0.114 <sup>***</sup>	Self-esteem	0.128 <sup>***</sup>
F	7.852 <sup>***</sup>	6.923 <sup>***</sup>	F	6.923 <sup>***</sup>	F	9.126 <sup>***</sup>	F	8.214 <sup>***</sup>	F	8.132 <sup>***</sup>
R <sup>2</sup>	0.34	0.36	R <sup>2</sup>	0.36	R <sup>2</sup>	0.33	R <sup>2</sup>	0.30	R <sup>2</sup>	0.40
Change R <sup>2</sup>	-		Change R <sup>2</sup>	-	Change R <sup>2</sup>	-	Change R <sup>2</sup>	-	Change R <sup>2</sup>	-

**Notes:** <sup>\*</sup>*p* < 0.05; <sup>\*\*\*</sup>*p* < 0.01

	I	II	III	IV	V	VI	VII	VIII	IX
I. Achievement	1.000								
II. Self-esteem	0.225	1.000							
III. Personal control	0.439**	0.065	1.000						
IV. Innovation	0.606**	0.215	0.480**	1.000					
V. Avoidance	0.265	0.369	0.462	0.365	1.000				
VI. Accommodation	0.275	0.476	0.645	0.562	0.576	1.000			
VII. Competition	0.683	0.561	0.459**	0.396	0.245	0.254	1.000		
VIII. Collaboration	0.499	0.387	0.283	0.348	0.434**	0.452**	0.112	1.000	
IX. Compromise	0.572	0.495	0.396	0.256	0.143	0.192	0.243	0.385	1.000

Notes: \* $p < 0.05$ ; \*\* $p < 0.01$

Source: Own processing

Table IV.  
Correlation matrix

higher scores in groups with no simulation experience. Engagement in a simulation experience of the automobile industry with complex decisions considering financial, operation, marketing, logistics and organizational issues among others requires a high capacity to manage workgroup conflicts. This leaves avoidance little space when the main goal is to apply learned knowledge and winning the simulating competition.

The significant change in participants' attitudes toward entrepreneurship indicates that the simulation had a positive and motivating influence on the need for personal achievement and control and self-esteem as desirable entrepreneur's attitudes (Jones and English, 2004). The regression analysis confirms the relationship between those attitudes and conflict management behavior towards internal workgroup reinforcement. These results are consistent with the study by Carlson (1985), which argues that attitudes are measurable and can be predicted by individuals' predisposition to entrepreneurship. Thus, the development of positive attitudes to entrepreneurship of participants indicates a greater predisposition to undertake entrepreneurial projects (Rae, 2005). These results encourage the incorporation of these simulation tools into educational programs (Zeithaml and Rice Jr, 1987) of future university degree-holders in Economics and Business and others interested in developing an entrepreneurial career. Because the simulation demands conflict management within and between groups, especially in the complementary activities and negotiations with real agents, it increases motivation and cooperative attitudes (Jehn, 1995).

Future research should emphasize the negotiators' role in the simulations, analyzing whether easier or more difficult negotiations influence entrepreneurial motivation and attitudes. Analyzing the inclusion of real professional agents in different aspects of the simulation is one of the lines of research that may clarify the participants' degree of immersion in the simulated reality. Further, technological advances can enhance simulation methodologies and improve their use in fostering entrepreneurship.

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