AN EXPERIMENTAL STUDY OF BUSINESS SIMULATION GAMES AS A MARKETING LEARNING METHOD: TRAINING MANAGERS MANAGEMENT MARKETING SKILLS

Francis Blasco
Mario Martínez Tercero
Universidad Complutense
Madrid, Spain
fblasco@emp.ucm.es
csegae09@cseg.ucm.es

Abstract

By means of a controlled experiment in an advanced marketing course, it has been contrasted that games (MMTv6 model) achieve higher learning levels than other learning methods. An objective of this article is to provide a more comprehensive vision of learning to facilitate the higher education of marketing managers. This theory is based on David Kolb's Theory of Experiential Learning [1]. The global aim of the study is to corroborate a Marketing Learning Theory which is expressed through three theoretical hypothesis related to show that learning marketing concepts and skills are better achieved through methods based on experience, such as marketing simulation games. The objectives of this study are: (1) To show that learning marketing concepts and skills are better achieved through based on experience methods, such as marketing simulation games. (2) To explain how marketing simulation games work: beginnings, current development, nature and results, practical applications and main differences as regards to other methods. (3) To state the importance of the learning process through experience in disciplines such as marketing. The experiment is developed with fifth year Comunication students in the School of Information Sciences of the Complutense University of Madrid as part of the subject called "Advanced Marketing". The selection of students who will take part in the simulation game is done randomly in order to guarantee that they all start from the same situation. They will also have to take an initial evaluation test by means of a practical marketing planning exercise to verify that students from both the Experimental Group and the Control Group have a similar level of knowledge regarding the contents of the first part of the course. The experiment was carried out as follows: (a) Initial Test: A traditional test is used and, on the other hand, information regarding the Learning Perception Pre-test is gathered. (b) Time to rest. (c) Experimental period: during this period the control group takes the second part of the course by means of the lesson method and practical exercises and the experimental group using a simulation game. (d) Final Tests: information related to the Learning Results Test is gathered, the Learning Perception Post-test, and the Questionnaire of the Experimental Group. The results obtained in each test will be summarised. The statistical software used in the whole verification process was the SPSSv14.

Keywords
Marketing simulation, experiential learning, marketing learning theory, simulation games.

1. INTRODUCTION

There has been a traditional confrontation between two totally different learning approaches, which Roger Schank (1997) has called, learning by "listening" and learning by "doing" methods. The first one is based on the most popular learning method used since the Medieval Ages: the "Master Lesson". On the other hand, the learning "by doing" approach uses alternative learning methods among which can be included practical assignments, internships or the more sophisticated methods, case study with or without computer support and simulation games (computerised in most cases) which use experience as an essential element to achieve learning objectives.
An objective of this work is to provide a more comprehensive vision of learning, to facilitate the higher education of marketing managers who are fully aware, that the failure of many companies is due to the lack of appropriate training of the responsible for the management of those firms (Schank, 1997) [2].

This work goes hand on hand with David Kolb's Theory of Experiential Learning since it considers such a Theory already corroborated by this author in his work: *Experiential Learning: experience as a source of learning and development* (1984) [1].
Furthermore, it could be said that this is one of many studies regarding the effectiveness of the simulation games as a learning method in higher education developed by authors such as Wolfe and Roberts (1986) [3], Faria (1987-1997) [4], Walters et al. (1997) [5], Tompson and Dass (2000) [6], Moizer et al (2006) [7]. Although none of them compares the effectiveness of marketing simulations games versus magisterial lessons.
The global aim of the study is to corroborate a marketing learning theory which is expressed through three theoretical hypothesis from which it can be deduced in a logical way five basic hypothesis, which in turn can be contrasted. The argument used is that if the five basic hypothesis can be contrasted, it will be able to corroborate the three theoretical hypothesis since those are logically derived from these.
In summary, it can be expressed the global objective through the following partial objectives:

1. To show that learning marketing concepts and skills are better achieved through based on experience methods, such as marketing simulation games.
2. To explain how marketing simulation games work: beginnings, current development, nature and results, practical applications and main differences as regards to other methods.
3. To state the importance of the learning process through experience in disciplines such as marketing.

2. APPROACH

2.1 Marketing Skills and abilities

Regarding to this study, the first step is to identify the knowledge and skills required by a marketing professional in any company. Main functions performed by the marketing manager will be analysed from different perspectives, which arise from the marketing planning process: Analysis, Identification of Objectives, Strategy Selection, Planning, Implementation, Monitoring and Assessment.
First of all, to fulfil these tasks, it will be identified the main skills and knowledge that a marketing manager should use as a base for the so-called "organised operational knowledge": abilities, technologies and pre-technological knowledge (Muñoz Seca and Riverola, 1997) [8].
From this point of view, the marketing manager needs to have certain skills and abilities in order to tackle the previously mentioned functions.
The following skills and abilities have been identified:

- Analytical ability
- Problem-solving skills
- Decision-making abilities
- Teamwork and interpersonal skills

According to Pérez López (1991) [9], Argyris and Schön (1978) [10], Muñoz Seca and Riverola (1997) [8], Revilla (1996) [11], and other prestigious authors, the two core skills, problem-solving and decision-making abilities, are also high-priority variables in the learning process.

2.2 Learning Theory

Once identified the basic skills and concepts that future marketing managers should have, it shall be explained the Theory which, from this perspective, explains in a clearer way how an individual learns: David Kolb's Theory of Experiential Learning (1984) [1].
The intellectual origins of this Theory are based on three different sources: first, the philosophical perspective of John Dewey's pragmatism (1938) [12], who can be considered as the precursor of the vision of learning as a creative activity; second, Kurt Lewin's Gestalt Theory (1951) [13]; and, finally, the rationalistic vision of Jean Piaget (1971) [14], who defended experience as a source of learning through the processes of adaptation and assimilation. Kolb (1984) [1] , points out that his Theory is based on the Thesis of the great Russian theorist Vytovsky who claimed that learning from experience is the process through which human development takes place. Based on Kolb and other authors' definition of learning who consider experience as the main element of the learning process, it can be concluded that learning is an ongoing process derived from experience which requires the resolution of conflicts among dialectical positions. Moreover, it is also a holistic process of adaptation to the

world, which includes exchanges between people and the environment. The main function of the learning process is the creation of knowledge.
David Kolb [1], based on his predecessors, represents the learning process as a cycle which goes through a number of stages: Specific Experience, Reflexive Observation, Abstract Conceptualisation and Active Experimentation (see Fig. 2).

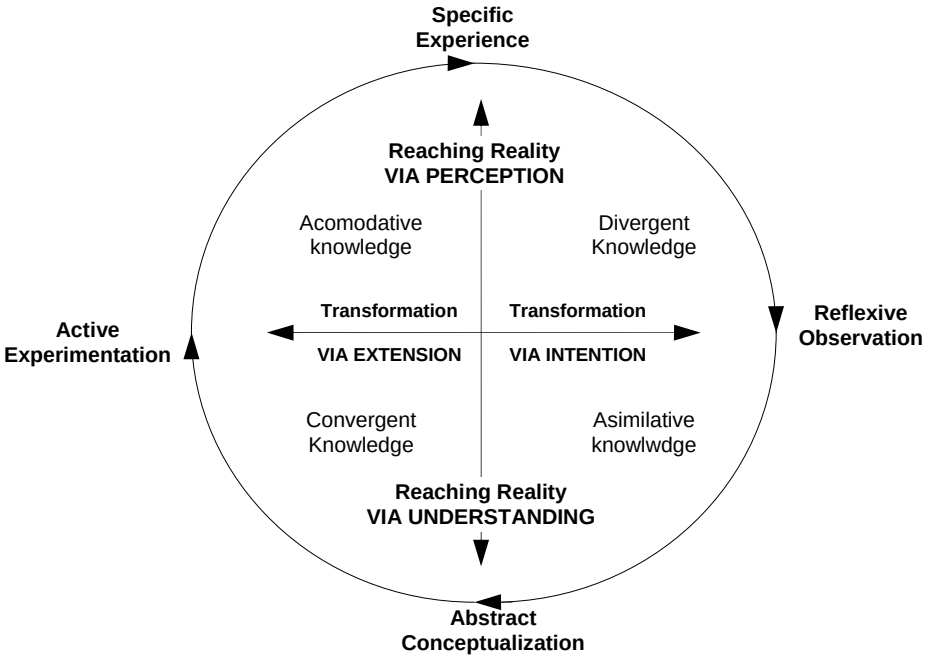

Fig. 2. The experiential learning cycle
SOURCE: Kolb (1984) [1]

2.3 Relationship between two process

Carefully analysing the process it can be observed that it starts with the involvement of the marketing manager with the reality of the organization which can be associated with Specific Experience stage described by Kolb [1]; it continues with the Internal and External Analysis of that reality, which can be identified with the Reflexive Observation stage; then comes the Identification of Objectives and Selection of Strategies during which the marketing manager will have to make assumptions on how to tackle specific situations, this is what Kolb describes as Abstract Conceptualisation; finally it comes to the stages of Planning, Implementation, and Monitoring and Assessment of Results achieved, which can be identified with Kolb's Active Experimentation stage which quickly leads to a new specific situation based on decisions made (see Fig. 3).

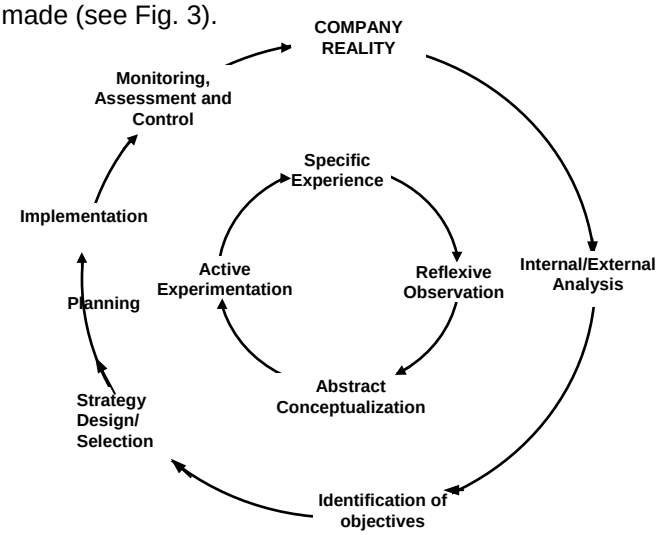

Fig. 3. Relationship between the Experiential Learning Cycle and the Marketing Planning Process
SOURCE: authors

The relationship between both processes is clear and makes us believe that the Experiential Learning Theory is the most appropriate way to explain the marketing learning process (see Fig. 4).
In this study, the following instruments will also be used, as part of this learning Theory:

- Kolb's Professional Skills Index (1984) [1], used to carry out one of the tests in our experiment.
- Ronald Fry's Learning Environments (1978) [15] which will help to study the different learning methods.

3. MARKETING SIMULATION GAMES

3.1 Simulation games as learning method

Once the basis of the learning process have been established, marketing simulation games will be presented, which represent the third cornerstone of our study. David Kolb (1984) [1] describes simulation games as "an appropriate method to facilitate experiential learning".
But, what is a simulation game? It is just a game where rules are based on an empirical model of reality. Also it must be based on a dynamic model, to become a true simulation since the evolution of time plays an essential role.
Any business simulation game, and therefore, a marketing simulation game, is made up by a number of basic elements (see Fig. 5).

- The players, teams which play the role of companies.
- An input, made up by the decisions the players make.
- The simulation model which is a dynamic simplification of a real system.
- An output, which are the results from the player's decisions during the simulation game.
- A context or game environment.
- The competitive nature of the game, although co-operation is not ruled out.
- The players cannot manipulate the simulated model.
- Repetition of the process.

Marketing simulation games, based on business simulation games, are focused on marketing related decisions and minimise the rest of the functional areas of the organization.

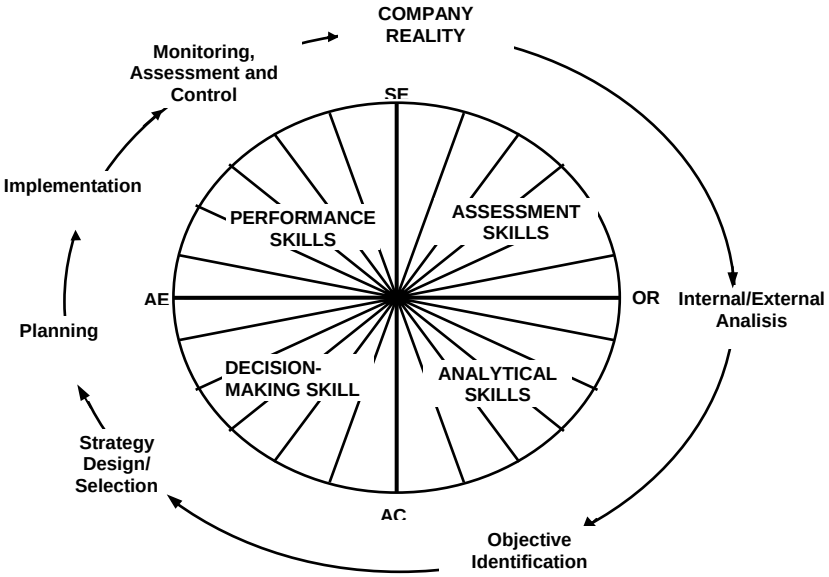

Fig. 4. Relationship between Professional Skills and the Marketing Planning Process
SOURCE: authors

After studying these games as a learning method we came to the conclusion that these games must fulfil some requirements in order to be considered as such:

- They should be based on a black box model.
- They should provide players with immediate information including the cost of the process.

- The products must be clearly defined.
- There must be specific deadlines.
- Variety, width and depth in the decision making process.
- Dimensions, units and realistic parameters.
- Versatility and flexibility.
- They must be an emulation of reality.

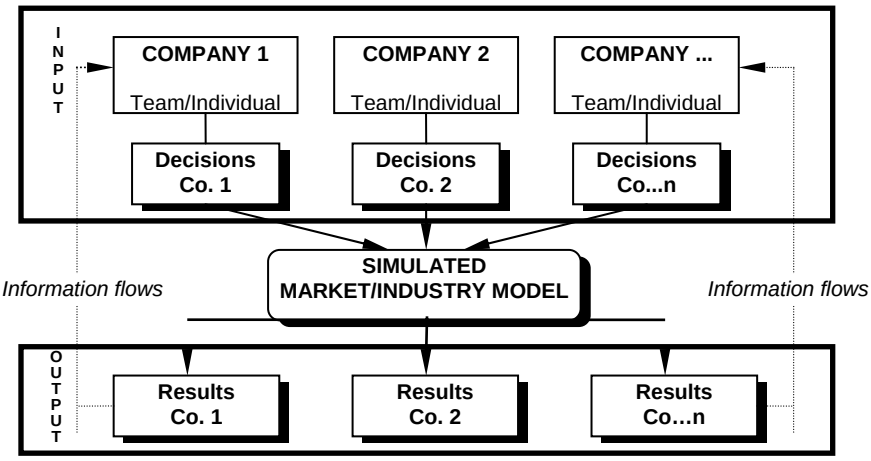

Fig. 5. Marketing Simulation Game
SOURCE: authors

3.2 Simulation games vs others learning methods

Simulation games are compared with two other popular learning methods: magisterial lesson and case method. The difference between these two methods has been established based on the Experiential Learning Theory. The two instruments used for this comparison are the Learning Environments and the Professional Skills Index.
The Learning Environments, introduced by Fry in 1978 [15], could be defined as any educational program, course design or class geared towards the different stages of experiential learning, thus, we can distinguish among (see Table 1):

- Highly Emotional Environments, geared towards Specific Experience.
- Complex Perceptual Environments, geared towards Reflexive Observation.
- Complex Symbolic Environments, geared towards Abstract Conceptualisation.
- Complex Behavioral Environments, geared towards Active Experimentation.

Each teaching method can reproduce one or several of these environments depending on the abilities and skills we want to develop. Therefore, some environments will be more complex than others.
According to our analysis, magisterial lessons method reproduces Perceptual and Symbolically Complex Environments, that is to say, they are geared towards the Reflexive Observation and Abstract Conceptualisation stages while case study and simulation game methods reproduce emotional, perceptual and symbolically complex environments, and so, they are geared mainly towards the Specific Experience, Reflexive Observation and Active Experimentation stages (Table 2).

PROFESSIONAL SKILLS INDEX	LEARNING ENVIRONMENTS
SPECIFIC EXPERIENCE *Affective Skills*	AFFECTIVELY COMPLEX ENVIRONMENTS
REFLEXIVE OBSERVATION *Perceptual Skills*	PERCEPTUALLY COMPLEX ENVIRONMENTS
ABSTRACT CONCEPTUALIZATION *Simbolic Skills*	SIMBOLICALLY COMPLEX ENVIRONMENTS
ACTIVE EXPERIMENTATION *Behavior Skills*	BEHAVIORAL COMPLEX ENVIRONMENTS

Table 1. Relationship between Kolb's Index, 1984 [1] and Fry's Learning Environments,1978 [15].
SOURCE: authors

LEARNING ENVIRONMENTS	LEARNING METHODS		
	Magisterial	Case Method	Simulation G.
AFFECTIVELY COMPLEX ENVIRONMENTS		X	X
PERCEPTUALLY COMPLEX ENVIRONMENTS	X	X	X
SIMBOLICALLY COMPLEX ENVIRONMENTS	X		
BEHAVIORALLY COMPLEX ENVIRONMENTS		X	X

Table 2. Learning Environments and the different Learning Methods
SOURCE: authors

If we refer to the abilities that are developed according to Kolb's Professional Skill Index [1] and compare the three methods, we could observe that while magisterial lesson and case method have quite a few shortfalls, simulation games are capable of developing emotional skills such as "personal involvement in the experience", "interpersonal skills", "sensitivity towards values", etc. This method is also able to develop perceptual skills such as "collecting and organising information", moreover, it develops behavioural skills as for example, "searching and exploring opportunities", "commitment with objectives", "decision-making", "setting feasible objectives", etc. It also develops symbolic skills such as, "experimenting new ideas", "analysing quantitative data", "verifying theories and ideas", etc.

4. EMPIRICAL RESEARCH

4.1 Hypothesis

The main objective of the research is to corroborate three hypothetical hypothesis. The first one is Kolb's Theory of Experiential Learning [1], which has been expressed as follows:

ThH1: The highest levels of learning take place when the individual goes through the four basic learning processes: Specific Experience, Reflexive Observation, Abstract Conceptualisation and Active Experimentation.
ThH2: Magisterial lesson method applied to marketing learning processes allows the student to complete, at the most, the basic learning Process in Experiential Learning which refers to Reflexive Observation and Abstract Conceptualisation, but it doesn't allow the student to complete the stages of Specific Experience and Active Experimentation.
ThH3: Simulation games, applied to marketing learning, allow the student to develop and combine the four basic learning processes in Experiential Learning.

The 2nd and 3rd theoretical hypothesis have been deduced from the analysis of the different learning methods used in marketing. The previous analysis is logical and rational, of a philosophical nature, however, the hypothesis must go under an empirical analysis and thus, it is necessary to corroborate the theoretical hypothesis by means of contrasting the following basic hypothesis logically deduced from the previous ones.
BH1: If Theoretical hypothesis (ThHs) are true, then the marketing students, who take part in courses which are based on simulation games, will make more efficient marketing decisions than those students who have completed their education only by means of magisterial lesson method.
BH2: If ThHs are true, then the students, who complete their marketing education by participating in courses based on simulation games, will value the contribution the course has made to the learning and training process higher than the students who have taken the same course based on magisterial lesson method.
BH3: If ThHs are true, then the students, who complete their marketing education through courses based on simulation games, will perceive that the course has helped them to improve the learning activities related to the "Reflexive Observation" and "Abstract Conceptualisation" stages, at least in the same measure than magisterial lesson method did during the same stages.

BH4: If ThHs are true, then the students, who complete their marketing education through courses based on simulation games, will perceive that the course has helped them to improve the learning activities related to the “Specific Experience” and “Active Experimentation” stages better than magisterial lesson method did in the same stages.

HB5: If ThHs are true, then the students, who have not completed their marketing education by means of courses based on simulation games, will perceive that the training course has provided fewer benefits in the learning activities related to the “Specific Experience” and “Active Experimentation” stages than the students who have completed their education through simulation game method.

4.2 The experiment

All these hypothesis can be observed during the experimental stage, and therefore the theoretical hypotheses can be corroborated or not. The next step will be to explain the methodology used to contrast these five basic hypothesis.

A casual cut study has been used by means of a controlled **“before-after” and “double blind” experiment** using two different groups (see Figure 6).

- An Experimental Group: this group takes part in a simulation game during the second part of the course. We have called this simulation game “Marketing Game Seminar”.
- A Control Group: this group takes the whole course combining the Magisterial Method with practical exercises into classroom.

The outline of the experiment is the following: during the first period it is gathered student information by means of a series of Initial Tests, then the course is delivered, and finally during the second period is collected all the data related with the Final Tests. Results have been obtained by means of two comparisons (see Fig. 7):

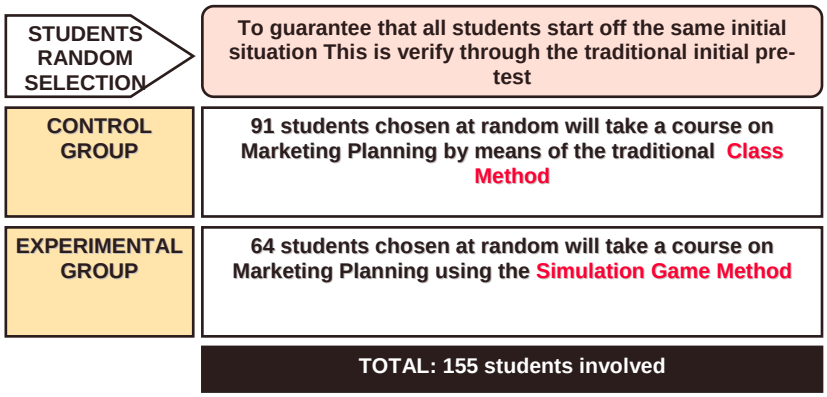

Fig. 6. A sample of the experiment
SOURCE: authors

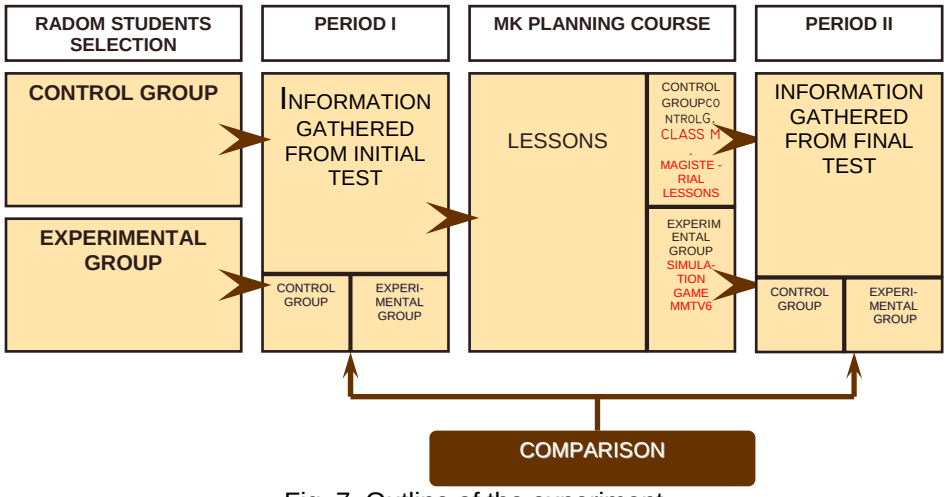

Fig. 7. Outline of the experiment
SOURCE: authors

- The evolution of students from the initial tests to the final tests (before-after analysis).

- The comparison between the scores given or obtained by the students in the Experimental Group and the Control Group.

The experiment is developed with 5th year Comunication students in the School of Information Sciences of the Complutense University of Madrid as part of the subject called “Special Marketing”. The students do not know that they are taking part in an experiment. The simulation game (MMTv6) is used during the second part of the course as an alternative teaching method which the students accept quite naturally. The selection of students who will take part in the simulation game is done randomly in order to guarantee that they all start from the same situation. They will also have to take an initial evaluation test by means of a practical marketing planning exercise to verify that students from both the Experimental Group and the Control Group have a similar level of knowledge regarding the contents of the first part of the course.
The experiment was carried out as follows:

- **Initial Test**: A traditional test is used and, on the other hand, information regarding the Learning Perception Pre-test is gathered.
- Time to rest.
- **Experimental period**: during this period the control group takes the second part of the course by means of the magisterial lesson method and practical exercises and the experimental group using a simulation game.
- **Final Tests:** information related to the Learning Results Test is gathered, the Learning Perception Post-test, and the Questionnaire of the Experimental Group.

The Learning Perception Pre-test and Post-test are based on Kolb’s Professional Skills Index [1]. The main objective of these tests is to find out the students’ degree of perception of his/her own learning process in each of the basic skills which appear during the four stages of the experiential learning process. This process is made up of 20 items, the last one being the total assessment. The calculation was carried out through a scale of apparently similar intervals of seven response categories**.**

4.3 Marketing Simulation Game chosen

Another important decision in the experiment was the choice of the marketing simulation game to be used by the Experimental Group. This was done in two stages. In the first one, we rejected all those games, which had not been tested enough in learning environments. Some of the marketing simulation games analysed from this perspective are the following ones: MARKSTRATv3, COMPETE, MMTv6, BRANDMAPS. The four simulation games analysed fulfilled this condition. The second one was the prestigious of the games in Spaniards Business Schools. MMTv6 and Markstratv3 are the two simulation games more extended, so we decided to do a deeper comparison between them (see Table 3 and 4). Finally, MMTv6 (PRAXIS) was chosen for the following reasons:

- It offered wider scope in decision-taking activities.
- It offered deeper decisions-taking activities.
- Uses specified products.
- Uses export markets.
- The products are clearly defined.
- Dimensions, units and realistic parameters.

The scope of the simulation game refers to the number of different decisions the game allows, while the depth refers to the high number of possible decisions introduced by the game per territory and product. We believe that the higher the scope, the more real the game is, and the deeper, the more complex the game becomes (see Tables 3 and 4).

4.4 Main results

Now, the results obtained in each test will be summarised. The statistical software used in the whole verification process was the SPSSv14.The results confirm the First Basic hypothesis (BH1) by means of the Learning Results Test that were quite revealing. The result of this test is measured through the solution to each specific problem. The success of the solution offered by the student is measured by the profits achieved by the company. The average profits achieved by the students in the Control Group were of -825 millions while in the Experimental Group the result was -554 millions. The average difference is thoroughly significant in T-Student Test (bilateral Sig. 0,002).

	Markstrat3	MMTv6
Management area reproduced	Marketing	Marketing
Other incident areas	-	Production
Marketing of	Durable Consumptions	Mass Consumptions
Sub-segment	Consumer electronics	Dairy products
Product	Non specified	Milk and Yogurt
Launching of new products	Yes	Yes
Launching of new trademarks	Yes	Yes
Export	Not	Yes
Number of companies taking part in the simulation	5	5
Definition of the period	1 year	1 year
Number of possible periods	12	10
Marketing Research	Yes	Yes
Habitual interface in Windows	Yes	Yes
Language	French, English	English, Spanish, Portuguese
Currency	Dollar	Dollar and Euro

Table 3. Markstratv3 vs MMTv6 (1)
SOURCE: authors

Decisions By Product/Market	MARKSTRAT3	MMT6
Production	1	1
Advertising Budget	2	1
Advertising Campaign	-	1
Mass Media	-	5
Consumer Price	1	3
Retails margin	-	3
Retails Price	-	3
Perceptual Objectives	1	1
Realization of Inventories	1	-
Sales Force	1	2
Sales Force Salary Level	-	2
Manufacturer Branches	-	1
Wholesalers	-	1
Physical R&D	1	-
Financing	2	2
POP	-	3
Trade Marketing	-	3
Sales Promotion	-	3
Type of Sales Promotion	-	3
Number of Sales Promotion	-	3
Details about Sales Promotion	-	3
Investment in Fixed Assets	-	1
Total Decisions Product/Market (deepness)	**10**	**45**
Products	**2**	**2**
Depth $D = \frac{decisions\ n^o / market\ n^o}{products\ n^o}$	**10**	**45**
Width: total number of decision	**116**	**189**

Table 4. Markstratv3 vs MMTv6 (2)
SOURCE: authors

Regarding the contrast of the BH2, which refers to the item of Global Course Assessment, we can conclude that the students in the Experimental Group rate the course higher than the students in the Control Group, moreover, the evolution of this item from the pre-test to the post-test is much better in the Experimental Group students than in the Control Group ones. The BH3 was contrasted through the Perception of Learning Tests analysing the items related with the Reflexive Observation and Abstract Conceptualization stages. The evolution of the students in the Experimental Group from the Initial to the Final tests is much more positive than that of the students in the Control Group. The students in the Control Group only achieve positive results in the item “organization of information” during the Observation and Reflection stage. They obtain quite low scores in the items “Build and test your own conceptual models” and “Design experiments to test your own ideas”.
It is interesting to point out that the Lesson Method only shows positive evolutions for the Control Group during the Abstract Conceptualisation stage. This fact can be taken as proof of the validity of

this theoretical model. According to all the results, the BH3 can be contrasted. Using a similar type of analysis by means of the T contrast of averages for two independent samples comparing results between the Control and Experimental groups, equally positive results for the Specific Experience and Active Experimentation stages is found. This will allow contrasting BH4 and BH5.

5. CONCLUSIONS

If the main objective is to educate and prepare students to develop the essential functions performed by the marketing professional, then they will have to learn the skills and abilities required to develop these functions, that is to say, analytical abilities, decisions-making skills, problem-solving and interpersonal abilities. All these abilities can be developed through a course based on marketing simulation games. To achieve higher levels of learning in the field of marketing education, we shall have to use methods which allow students to go through each stage of Kolb's experiential learning model should be needed, and, therefore, allow them to complete the "Experiential Learning Process". Marketing simulation games, when are used as a learning method, allow students to complete the above mentioned process.

References

[1] Kolb, D. (1984), Experiential Learning: Experience as the source of learning and development. New Jersey: Prentice Hall Inc.

[2] Schank, R. (1997), Virtual Learning. Mc Graw Hill.

[3] Wolfe, J. and Roberts, C.R. (1986), "The Effects of Different Grade Weights on Business Game Learning Levels", *Journal of Educational Technology Systems*, Vol. 14 (4), pp. 307-316.

[4] Faria, A.J. (1987a), LAPTOP: A Marketing Simulation. Business Publications. Plano, TX.
Faria, A.J. (1987b), "A survey of the use of business games in academia and business". Simulations & Games, 18 (2), 207-224.
Faria, A.J. (1997), "Business Simulation Games: Current Usage Levels. A Ten Year Approach, 1987 y 1997". Ontario: University of Windsor.
Faria, AJ. and Dickinson, J.R. (1997), LAPTOP: A Marketing Simulation. Burr Ridge, IL: Richard D. Irwin, Inc.

[5] Walters, B.A., Coalter, T.M. and Rasheed A.M.A. (1997), "Simulation Games in Business Policy Courses: Is There Value for Students?" *Journal of Education for Business*, Vol. 72 (3), pp. 170-174.

[6] Thompson, A.A. Jr. and Stappenbeck, G.J. (1998), *THE BUSINESS STRATEGY GAME: A global simulation*. 5th ed. Boston. Irwin McGraw-Hill.

[7] Moizer, J., Lean, J., Towler, M. and Smith, G. (2006),"Modes of Learning in the Use of a Computer-Based Business Simulation Game", *International Journal of Learning Technologies*, Vol. 2 (1), pp.49-61.

[8] Muñoz Seca, B. and J. Riverola (1997), Gestión del Conocimiento. Barcelona: Folio.

[9] Pérez López, J.A. (1991), Teoría de la acción humana en las organizaciones: La acción personal. Rialp. Madrid.

[10] Argyris, C. and D. Schön (1978), Organizational Learning: A Theory of Action Perspective. Reading Mass: Addison Wensley.

[11] Revilla, E. (1996), Factores determinantes del aprendizaje organizativo. Club Gestión de Calidad. Madrid.

[12] John Dewey's pragmatism (1938) in Haskins, C. and Seiple, D. I. edited (1999), Dewey reconfigured: essays on deweyan pragmatism. Albany : State University of New York Press.

[13] Lewin, K. (1951), Field theory in social science: selected theoretical papers. Edited by Dorwin Cartwright. Harper and Brothers. New York.

[14] Piaget, J. (1971), Structuralism. Harper Torchbooks. New York.

[15] Fry, R.E. (1978), Diagnosing Professional Learning Environments: An Observational Framework for Assesing Situational Complexity, Dissertation Thesis. Massachusetts Institute of Technology.