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Factors of Success in Improving Performance in a Marketing Simulation Game

Abstract. *The emergence and development of business simulation games, in general, and marketing simulation games, in particular, have changed the way courses in these fields can be approached in higher education institutions. To identify the key success factors that contribute to improved student performance in a marketing simulation game, we used the quantitative marketing research method. The sample consisted of undergraduate students attending the 'Marketing simulation' course. The factors that we tested using the structural equation modelling technique (SEM) were: teamwork, feelings during the game, personality, marketing knowledge, attributes of the marketing simulation game, and characteristics of the marketing simulation game. After analysing the results, a significant relationship could be observed between these factors and the students' performance in the marketing simulation. The article proposes specific recommendations for the digitalisation of universities, students, simulation games developers, professors, trainers, and marketing professionals.*

DOI: 10.24818/18423264/59.1.25.03

Keywords*: performance, marketing, simulation game, marketing simulation game, factors, success.*

JEL Classification: M31, A22.

1. Introduction

Marketing is considered the most important function of a company, being the heart of all organisational activities at the strategic and operational levels. Today's companies, faced with a hyper-competitive and digitalised environment, have realised the importance of the holistic marketing approach and the need to think strategically (Kang & Na, 2020). Based on this idea, companies are more interested in hiring business graduates with work experience and skills in the real world, not only because they have a bachelor's degree. In this sense, higher education institutions must adapt to this reality and correlate their curriculum with the needs of the labour market. Business simulation games, in general, and marketing simulation games, especially, can contribute to this topic by proving a practical approach to the learning process.

As a vehicle for learning, business simulation games have been available since the late 1950s, first used in 1957 at the University of Washington (Faria, 2006). From this point, the popularity of these educational tools grew rapidly as follows: in 1962 there were 29 marketing simulation games, in 1969 it was described nearly 190 business simulation games (over 40 of which were marketing games), and in 1980 there were 228 business games (out of which 46 were marketing games) (Graham & Gray, 1969; McRaith et al., 1962). Over time, to provide students with an active learning experience, higher education institutions began to incorporate simulation games into their courses.

Faria (2006) stated that business simulation games were used by more than 1.700 degree-granting universities in the United States of America and about 12.000 university business educators. On the other hand, in a more recent study focused on Croatian universities, Pejić Bach et al. (2020) asserted that around 20% of academics from the economic and business fields used simulation games. There are enough reasons for students, teachers, and marketing professionals to use marketing simulation games because the benefits seem substantial and the drawbacks are either avoided or improved to the point where they may not matter. Marketing simulation games are associated with strategic thinking (Pagani & Otto, 2013), experiential learning (Laverie et al., 2020), a risk-free environment (Tiwari et al., 2014), and increased educational performance (Van Esch et al., 2020).

This article is structured as follows: the literature review presents the hypothesis of the study and the conceptual research model, we continue with the methodology of the study, then we discuss the main findings, and we draw theoretical and practical implications in the conclusion section.

2. Literature review and model specifications

Marketing simulation games provide hands-on experience that allows participants to bridge the gap between theoretical knowledge and practical application, replicating real-world marketing challenges in a controlled environment and promoting a deeper understanding of market dynamics, which includes consumer behaviour, competition, and external factors (Lemon & Verhoef, 2016). In addition, many simulation games are collaborative and improve communication and teamwork skills. Bolton et al. (2019) suggested that participants in a business simulation game develop their strategic thinking skills and improve their skills to adapt to a dynamic and turbulent market. Moreover, marketing simulation games offer participants a global perspective of the market, and stimulate them to have customer-centric approaches, to make ethical decisions and to budget their activities according to the specifics of the market.

Developed by the training and development group StratX, Markstrat simulation game uses a large set of instruments in markets with varied consumer preference in order to improve the efficiency of the strategic decisions that fall under the main marketing areas such as marketing mix, market analysis, and market research. Therefore, the digital platform became an effective educational tool, especially for marketing management, which is commonly used by students or companies in their training activities, as it allows greater knowledge of the firm's marketing practices and can go beyond the basic development of a traditional strategic plan (Campomar et al., 2013). This practical approach to learning uses a digitally created environment where up to six teams per industry compete against each other. This means that team members should develop strategies that consider both short- and long-term plans to better promote and sell their brands within their portfolio, as they have to face a certain number of competitors when, ultimately, they want to have the best Share Price Index (SPI).

Markstrat is a strategic marketing simulation game that successfully deploys marketing tools for participants to use in a virtual market for marketing-related decisions. Therefore, the authors consider it important to evaluate whether there are correlations between attributes, characteristics, and performance.

Therefore, the authors propose the following hypotheses:

Hypothesis 1 (H1). *Student teamwork (ST) positively influences performance in a marketing simulation game (PMSG).*

The use of marketing simulation games (e.g., Markstrat) can increase the capacity for teamwork, as it uses such a traditional learning tool, and it stimulates participants in terms of learning how they can work in teams. It is evident that marketing simulation games can be used as an effective tool remotely. A study (Hayes et al., 2010) has shown that when working in international teams, a team member with previous experience related to the actual simulation used is not a decisive factor in terms of team success. Moreover, internationally diverse teams

do not underperform when compared with non-diverse ones, but may feel the need to work harder to achieve similar results.

Hypothesis 2 (H2). *Students' feelings during the game (SFDG) influence performance in a marketing simulation game (PMSG).*

Previous studies in this field of research indicated that both positive and negative feelings seen through the emotions that participants feel can have an impact on motivation, and thus on their subsequent performance (Pekrun, 2006). Furthermore, the scientific literature supports the fact that, in general, emotions have an important impact on performance (LeBlanc & Posner, 2022).

Hypothesis 3 (H3). *Personality (SP) influences performance in a marketing simulation game (PMSG).*

Kickul (2001) has drawn out a performance model highlighting that personality antecedents influence group process variables and, in turn, simulation performance variables decoded through the lens of profit, market share, return on sales/assets/equity, asset turnover, and stock price.

Hypothesis 4 (H4). *Students' marketing knowledge (ST) positively influence their performance in a marketing simulation game (PMSG).*

Research based on a marketing simulation game trying to show whether it boosts marketing knowledge and student performance at final examinations has proved a positive performance in terms of quantitative questions (Whiteley & Faria, 1989). This can show potential towards converting theoretical concepts used within a simulation to actually drive final performance as reflected in SPI.

Although not directly related to performance (SPI), Dickinson et al. (1990) suggested that in a business simulation game, the inability to adapt to the digital environment might have been influenced by the participants' level of marketing knowledge.

Hypothesis 5 (H5). The **perceived importance of marketing simulation game attributes (IMSGA) has a direct influence on** *performance in a marketing simulation game (PMSG).*

Hypothesis 6 (H6). *The characteristics of a marketing simulation game (CMSG) influence the performance of a marketing simulation game (PMSG).*

Based on previous discussions, we propose the following research model and hypotheses (Figure 1):

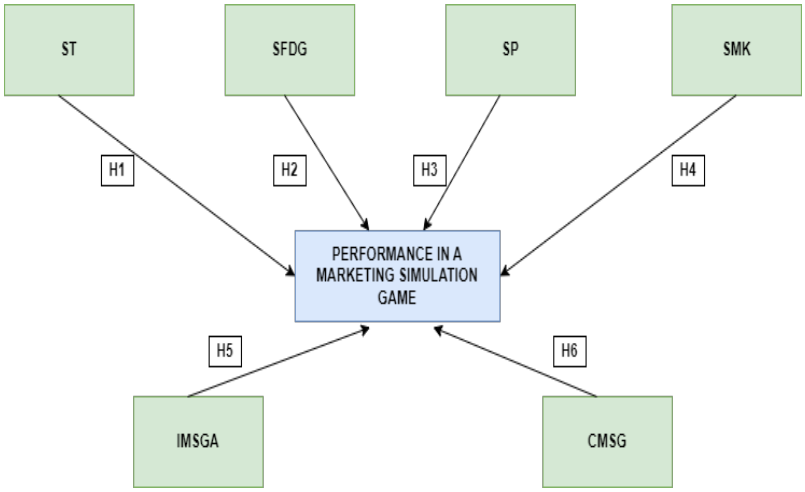

Figure 1. Research Model
Source: The authors' own creation.

3. Methodology

To test these hypotheses, we conducted a quantitative survey. Data were collected using a questionnaire from a sample consisting of undergraduate students enrolled to the Marketing simulation lecture. For instrument validation, the questionnaire was tested in a group of 20 students. In its final form, it included 17 items that measure seven factors using a five-point Likert scale (where 1 = strongly disagree and 5 = strongly agree). After validation, the questionnaire was uploaded to Google Forms and sent to the students.

Data collection was carried out between 8 January and 26 January 2024. We received a total of 198 questionnaires and, after validation, 28 were removed from the sample due to incomplete answers. The result was a sample of 170 questionnaires. The response rate was 85,8%.

A confirmatory factor analysis (CFA) was used on all indicators measured for each individual factor, to keep only the relevant elements for the next phase, which load the model according to the usual norms above 0.5 (Kline, 2023). Therefore, for ST, the first three relevant indicators were retained out of 17 measured indicators. For SFDG, the first three relevant indicators of 14 indicators measured. For SP, the first three relevant indicators were retained out of 18 indicators measured. For SMK, the first two relevant indicators of the 14 measured indicators. For IMSGA, the first three relevant indicators were retained out of 11 measured indicators. For CMSG, the first 3 relevant indicators of 15 indicators measured for the analysis.

The conceptual model, presented in Figure 1, was represented in a structural equation model (see Figure 2), to test the influence of each factor and to be able to describe the explanatory situation of the investigated phenomenon.

4. Results

The model, based on structural equation modelling (SEM), used the maximum likelihood estimation technique and was run in IBM SPSS AMOS. To begin the analysis, the normal distribution of the data was first checked. Table 1 presents the assessment of normality and it can be seen that both skewness and kurtosis describe relatively good normality values for each indicator measured. The multivariate kurtosis value of 38.87 is well below the mean limit of 78.70 recommended by experts (Cain et al., 2017).

Table 1. Assessment of normality

Variable	min	max	skew	c.r.	kurtosis	c.r.
SMK 1	1.000	5.000	-0.326	-1.738	-0.210	-0.560
SMK 2	2.000	5.000	-0.545	-2.900	-0.305	-0.812
SP 1	1.000	5.000	-0.715	-3.808	0.298	0.793
SP 2	2.000	5.000	-0.441	-2.349	-0.470	-1.251
SP 3	1.000	5.000	-0.512	-2.726	-0.028	-0.074
CMSG 1	2.000	5.000	-0.334	-1.781	-0.762	-2.029
CMSG 2	1.000	5.000	-0.941	-5.011	0.933	2.484
CMSG 3	2.000	5.000	-0.436	-2.321	-.511	-1.361
SFDG 1	1.000	5.000	0.732	3.899	-0.515	-1.370
SFDG 2	1.000	5.000	0.469	2.499	-0.598	-1.591
SFDG 3	1.000	5.000	0.555	2.954	-0.759	-2.021
IMSGA 1	3.000	5.000	-0.753	-4.006	-.598	-1.592
IMSGA 2	2.000	5.000	-0.424	-2.258	-.557	-1.482
IMSGA 3	2.000	5.000	-0.473	-2.520	-.153	-0.407
ST 1	1.000	5.000	-1.254	-6.676	0.809	2.154
ST 2	1.000	5.000	-1.003	-5.340	0.462	1.229
ST 3	1.000	5.000	-0.725	-3.858	-0.067	-0.177
SPI	1.000	3.000	0.178	0.948	-1.366	-3.636
Multivariate					38.865	9.442

Source: The authors' own creation.

To validate the model's ability to adequately explain the investigated phenomenon, that is, the conceptual model, several model fit indices were calculated and compared (Hayduk & Littvay, 2012). The fit statistics of the model showed a good fit to the data: CMIN/DF: 1.329; GFI: 0.903; IFI: 0.952; TLI: 0.941; CFI: 0.950; RMR: 0.052; RMSEA: 0.044. The standardised regression weights for the tested model can be observed in Table 2. The negative sign presented in the SFDG is due to the reverse coding of the variable, meaning that the students'

feelings during the game were actually positive and they did not present fear of making decisions.

Table 2. Standardised regression weights for the default model

			Estimate
SMK	**<---**	**PMSG**	**0.700**
SP	**<---**	**PMSG**	**0.537**
CMSG	**<---**	**PMSG**	**0.943**
SFDG	**<---**	**PMSG**	**-0.266**
IMSGA	**<---**	**PMSG**	**0.682**
ST	**<---**	**PMSG**	**0.685**
SPI	**<---**	**PMSG**	**0.097**
SMK 1	**<---**	**SMK**	**0.713**
SMK 2	**<---**	**SMK**	**0.665**
SP 1	**<---**	**SP**	**0.738**
SP 2	**<---**	**SP**	**0.700**
SP 3	**<---**	**SP**	**0.550**
CMSG 1	**<---**	**CMSG**	**0.652**
CMSG 2	**<---**	**CMSG**	**0.630**
CMSG 3	**<---**	**CMSG**	**0.615**
SFDG 1	**<---**	**SFDG**	**0.542**
SFDG 2	**<---**	**SFDG**	**0.902**
SFDG 3	**<---**	**SFDG**	**0.800**
IMSGA 1	**<---**	**IMSGA**	**0.869**
IMSGA 2	**<---**	**IMSGA**	**0.885**
IMSGA 3	**<---**	**IMSGA**	**0.500**
ST 1	**<---**	**ST**	**0.633**
ST 2	**<---**	**ST**	**0.687**
ST 3	**<---**	**ST**	**0.662**

Source: The authors' own creation.

To verify that all latent factors and measured indicators are adequate, score validity tests were performed. The results of the convergence validity and discriminant validity test are presented in Table 3 and Table 4. Convergent validity shows that each group of variables indeed measures the same construct, as their intercorrelations are appreciable in magnitude (Table 3). All estimated standard loadings exceeded the recommended level of 0.5, suggesting good convergent validity (Fornell & Larcker, 1981), and Cronbach alphas were higher than 0.7 suggesting good reliability for all construct scales.

Table 3. Convergent Validity and Reliability Tests

Construct	Items	Factor loadings > 0.5	Cronbach alpha > 0.7
Students' teamwork ST	ST 1	0.87	0.949
	ST 2	0.89	
	ST 3	0.50	
Student feeling during the game SFDG	SFDG 1	0.54	0.791
	SFDG 2	0.90	
	SFDG 3	0.80	
The students' personality SP	SP 1	0.74	0.779
	SP 2	0.70	
	SP 3	0.55	
Students' marketing knowledge SMK	SMK 1	0.71	0.918
	SMK 2	0.66	
The importance of marketing simulation game attributes IMSGA	IMSGA 1	0.63	0.835
	IMSGA 2	0.69	
	IMSGA 3	0.66	
Characteristics of the marketing simulation game CMSG	CMSG 1	0.65	0.905
	CMSG 2	0.63	
	CMSG 3	0.61	

Source: The authors' own creation.

Discriminant validity shows that the intercorrelations between factors assumed to measure different constructs (the square root of the AVE) are above the interconstruct correlations, which means good discriminant validity (Table 4). All the coefficients presented have $p < 0.05$.

Table 4. Correlations and Square Root of the AVE

	ST	SFDG	SP	SMK	CMSG	IMSGA
ST	**0.800**					
SFDG	0.271	**0.339**				
SP	0.159	0.067	**0.199**			
SMK	0.080	0.034	0.020	**0.100**		
CMSG	0.128	0.054	0.032	0.016	**0.160**	
IMSGA	0.153	0.065	0.038	0.019	0.031	**0.191**

Source: The authors' own creation.

Figure 2 reveals the structural model and the estimates of the standardised parameter estimates resulting from the study.

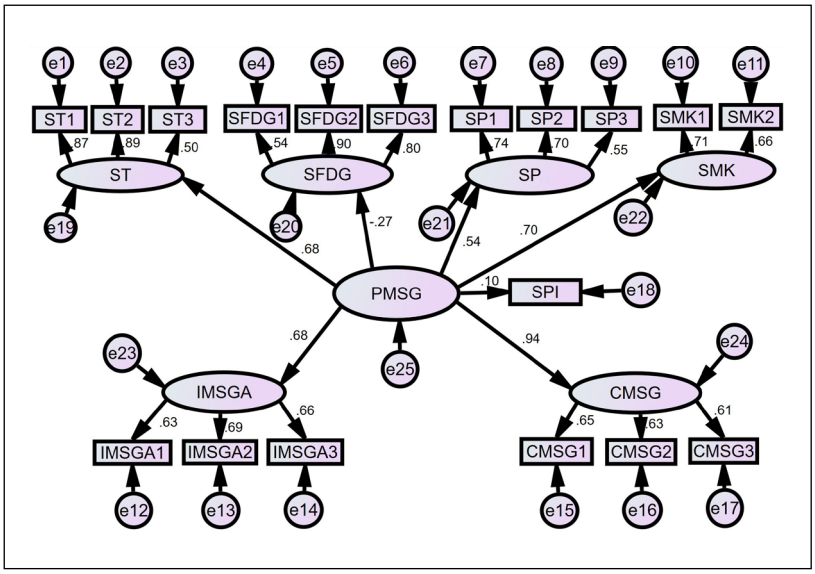

Figure 2. Research model with estimates of standardised parameter estimates

Note: PMSG = performance in a marketing simulation game, ST = Teamwork of students, ST1 = Actively involved in decisions, ST2 = constructive team interactions, ST3 = team empathy, SFDG=Student feeling during the game, SFDG1=Indifference, SFDG2=Lack of confidence, SFDG3 = Fear, SP = The personality of students, SP1 = Work under pressure, SP2=Courage, SP3=Negotiation skills, SMK = Marketing knowledge of students, SMK1 = Marketing mix, SMK2=Promotion, IMSGA=The importance of attributes of marketing simulation game, IMSGA1 = Being realistic, IMSGA2=To simulate market-orientated activities, IMSGA3=Constructive team interactions, CMSG=Characteristics of the marketing simulation game, CMSG1=Practical applicability, CMSG2=Quick results, CMSG3=An overview of economic situations, SPI=Share price index.

Source: The authors' own creation.

5. Discussions

Based on factor analysis, the results of our research illustrate some of the key factors to improve performance in a marketing simulation game. The authors identified and analysed six factors: four of them refer to students (teamwork, feelings during the game, personality, and marketing knowledge), while the other two refer to the marketing simulation game (attributes and characteristics).

The results confirmed H1 that teamwork (ST) positively influences performance in a marketing simulation game (PMSG). The influence is quite significant at 0.68. Within the teamwork of students, constructive team interactions matter the most, followed by the decision to actively participate in decision making and team empathy. In this sense, Freeman (1996) highlighted that a person's attitude toward teamwork has an influence on their grade point average and, thus, their educational performance. Within a study conducted by Petkova et al. (2021), an idea emerged when analysing high scores obtained by students (thus a strong indicator of performance) within a team linked to the fact that the student knew the

actual contribution he brought to the team and the positive attitude he also had. Furthermore, the results confirmed the second hypothesis (H2) that the students' feelings during the game positively influence the performance in a marketing simulation game (PMSG). The negative value of -0.27 displayed in the model is explained by the reverse coding of the parameters, indicating that the students did not suffer from lack of confidence, were not afraid, and were not indifferent during the simulations. These results are in line with other studies(Kramer, 1999).

According to the analysis, personality (SP) influences their performance in a marketing simulation game (PMSG), which supports H3. The influence is slightly above average at 0.54. Within the personalities of the students, the greatest emphasis was placed on working under pressure, on their courage, and on their negotiation skills during the simulations. The research results also confirmed H4. It can be observed how the concepts knowledge levels of the analysed are closely correlated 0.70 cu PMSG, all correlations being positive and statistically significant, most of them at a confidence level of 99%. Students mainly used their knowledge of marketing mix and promotion techniques. The results of the study show that the students' perception of their knowledge about everything that means marketing, marketing mix, sales, research development, or production does not influence the SPI score in any way. Thus, the study shows that the theoretical part is not always sufficient when it comes to simulating a complex experience, and there are many more important variables than theoretical knowledge that must be considered to succeed on the market, even if it is also about a simple simulation.

These results highlight that there is a correlation between the degree to which students consider the attributes of a marketing simulation game to be important for a marketing simulation game and the performance in a marketing simulation game (PMSG) (H5). Although there is no real impact in terms of the extent to which students consider that the analysed attributes are important to a marketing simulation game and the Share Price Index score, the attributes of the game itself are relevant on their own 0.68. The most important aspects were to simulate as many market-orientated activities as possible, constructive interactions, and realistic. For example, it is easy to use and learnt quite quickly, provides a sense of realism, promotes learning-by-playing, determines participants to fence against intense competition, teaches them analytical skills and techniques, generates high levels of motivation and interest (Campomar et al., 2013), and is entertaining and fun (Tonks, 2002).

The study confirmed H6 that the characteristics of the marketing simulation game influence student performance, and this to the greatest extent, with a significance of 0.94. The most important characteristics are practical applicability, quick results, and a comprehensive overview that a marketing simulation can provide. Simulations and games have been shown to shape student performance (Vlachopoulos & Makri, 2017). Research indicates that business simulations impact the decision-making process (Tiwari et al., 2014) and, in varied academic settings, can significantly impact student performance by enabling decision making based on real-time results.

6. Conclusions

The emergence and development of business simulation games, in general, and marketing simulation games, in particular, have changed the way courses in these fields can be approached in higher education institutions. From a theoretical point of view, this article contributes to the enrichment of the literature on marketing simulations. Provides a theoretical framework that brings about some success factors in improving performance in a marketing simulation game. Furthermore, the article presents the student's perceptions of these factors, highlighting the fact that performance is associated with the following factors: teamwork, feelings during the game, personality, marketing knowledge, marketing simulation game, and marketing simulation game.

One of the most important practical implications of our study is for higher education institutions. In the process of continuous effort of digitalisation, universities have to include simulation games into the curricula as an independent lecture or as a practical activity to the existing ones. Business simulation games have a great impact on the learning experience of students and will increase the understanding of concepts and their implementation in practical activities. Moreover, simulation games represent a good way in which students can exercise their transversal competencies, such as teamwork, networking, and collaboration, and communication skills.

This is a collaborative aspect that allows students to develop significant team skills such as communication, coordination, and conflict resolution, which are highly valued in the professional world. Simulation games as part of the curriculum will prepare students for a more digital workplace, where digital tools are commonly used. In this sense, students who learn to use IT related programmes at their universities are much better prepared for future careers and will be more flexible and competent in digital environments (Goulart et al., 2022).

Also, developers of business simulation games, in general, and marketing simulation games, in particular, could take into consideration students' perceptions regarding their features as key stakeholders. This approach will lead to adjustment of the level of difficulty, improving the simulation game by adding new features, or making the interface more user-friendly.

Our study is valuable for students who may consider success factors to improve performance in marketing simulation games. They could learn specific strategies and tactics that enable them to achieve better results in such games. Also, by considering the results of our study, they will be much open-minded when they are involved in a simulation game. Educators and trainers could use the information in the article to improve their teaching methods and provide more effective guidance to students on the use of marketing simulation games as learning tools. Additionally, marketing professionals could use the results to enhance their skills and knowledge in marketing through simulation games. These skills can be applied in real-world business settings to achieve better results in marketing strategy and campaign execution.

Regarding future research lines, it might be relevant to expand the study to other marketing simulation games, such as Cesim, LiveMaX, or Simbound. Since this study has been based on some of the factors that improve performance in a marketing simulation game, future research should be conducted to identify and analyse other relevant factors.

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