

Usage of Business Simulation Games in Croatia: Perceived Obstacles

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Business simulation games (BSGs) enhance learning, since they actively involve students in the educational process through game playing. They began to play important role in business education in many universities in Croatia. However, quantitative information on their usage in higher educational institutions (HEIs) in Croatia is still scarce. Goals of the paper are to explore: (1) differences among BSGs users and non-users according to demographic characteristics, (2) differences among BSGs users and non-users according to perceived obstacles of BSGs usage, and (3) impact of both demographic characteristics and perceived obstacles on the decision on usage or not-usage of BSGs. A survey was taken in business and economics departments of HEIs in Croatia. A regression model has been used to test the impact of demographic characteristics of educators and the perceived obstacles to the usage of BSGs in educational practice. Results indicate that BSGs usage is currently at a low level, mainly due to the lack of funds and management support. Academic rank, gender, and attitude toward new technologies also impact BSGs usage.

Key Words: business economics education; business simulation games; perceived obstacles

JEL Classification: O32, O33, P46

Introduction

The information and technology era makes technology an inevitable factor, both in the private and professional life (Zoroja 2011). New generations of students grew up with computer games and are much more interested in dynamic and active way of learning than in traditional teaching style (Prensky 2008). Students prefer active, visual and interactive learning, especially focused on problem solving and on real business situations (Whiteley and Faria 1989). However, it is important to highlight that traditional teaching methods should not be replaced with innovative methods of learning, but it is important to combine them with BSGs, simulations, multimedia instruction and interactive activities in order to make

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studying easier, interesting, and more effective (Tan 2007; Tal 2010; Lin and Tu 2012). Ex-cathedra lectures should be combined with BSGs in order to motivate students and to enable them to learn by virtual, direct and concrete experience (Proctor and Marks 2013).

BSGs are widely used in developed countries, like United States, where Faria and Wellington (2004) found out that 30.6% of the professors surveyed used BSGs in their teaching. On the other side, surveys done in other countries are scarce, and indicate much lower levels of usage. Chang (2003) found that only 7.4% professors are using BSGs in their teaching at the time of the survey, while number of professors tried to use them and later quit on their usage. In order to fulfill the gap in knowledge on the usage of BSGs in transition countries, the survey on the usage of BSGs in business and economics departments of HEIs in Croatia was conducted, with the following goals: (1) differences among BSGs users and non-users according to demographic characteristics, (2) differences among BSGs users and non-users according to perceived obstacles of BSGs usage, and (3) impact of both demographic characteristics and perceived obstacles on the decision on usage or not-usage of BSGs.

This paper consists of five sections. After the introduction there is a literature review of BSGs, their history and usage. Research methodology is explained in the next section, including a sample description and the research method. Results are presented in the fourth section. The last section, Conclusion and Discussion, outlines educational implications of BSGs, research limitations of this paper and comparison with other research.

Literature Review

BSGs can be defined as a representation of the reality through simplified simulation model which imitate some business situation or process (Pasin and Giroux 2011; Blazic et al. 2012). They request active business decision making, or rather they request reaching the best results in given conditions and circumstances (Zapalska and Brozik 2008; Zantow, Knowlton, and Sharp 2005). Simulation games were first used in the United States army in the 50' (e. g. war strategies, operational researches and information technology). After their positive effects in the army, they were used by multinational companies in educating their own employees and employing new working force (Cook and Swift 2003). Also, at that time several BSGs were developed for the consulting firm of McKinsey & Company (Gonen, Brill, and Frank 2009). Having proved themselves valuable

tool of integration of theoretical knowledge and management practice their usage in the education started to increase significantly in the 70' and 80' of the last century (Neville and Adam 2003).

Today, many corporations, managers, professors, consulting firms and business programs use BSGs in the educational process (Gonen, Brill, and Frank, 2009). Simulation games are also useful for the employees in knowledge based industries (Roblek et al. 2013). Faria and Wellington (2004) found out that 30.6% of the HEIs' professors used BSGs in their classes. Even larger level of usage has been found in Primary and Secondary education level in United States. Proctor and Marks (2013) found out that 40.5% of the professors in Primary and Secondary educational level are using BSGs. However, research on the usage of BSGs in other countries indicate that the usage of BSGs is much lower, with 7.4% professors using BSGs in their teaching in Hong Kong (Chang 2003).

The main advantage of BSGs is that they allow students to be an active participant in the educational process, in which students are learning-by-doing (Aldrich 2005). Participants make the decisions without serious consequences or assumptions of personal risk, because BSGs represent reality through simplified simulation model (Summers 2007; Pejic Bach and Ceric 2007; Pasin and Giroux 2011). Therefore, they allow managers to improve their decision-making skills by formulating and confirming a detailed analysis of their decision, which have positive effects on their future business work and decisions (Gonen, Brill, and Frank 2009). In addition, during the BSGs, students learn how to work in a team with different types of people and how to solve the conflict situation (Kim, Park, and Baek 2009). Also, business simulation games (BSGs) have positive influence on motivation and learning performances (Tao, Cheng, and Sun 2009; Yasarcan 2010).

There are also shortcomings of using BSGs in class. Professors or educators need more time to prepare for the usage of BSGs in the class compared to the ex-cathedra teaching (Lunce 2006). Lack of adequate BSGs which deal with theory of the course and simplification of reality are also important obstacles in usage of BSGs (Blazic et al. 2012). Most simulations (from the US or the UK) do not replicate the conditions found in other cultures/economies. Simplified BSGs may give wrong ideas of real problems that happen in the business world and which managers have to deal with. That is why a development of a qualitative simulation game demands significant planning and investment in terms of time, experts and financial resources.

Besides the large number of advantages, major obstacles are also present to the usage of BSGs in educational process: financial investment, time and organizational constraints and lack of management support (Lunce 2006). Lack of funds and management support is also stated by Gilgeous and D’Cruz (1996). Lean et al. (2006) state that some professors consider BSGs as necessary and some even never heard of NSGs. Faria and Wellington (2004) stress the role of tradition and technology, as difficulty in changing classical teaching methods, and difficulty in adopting to new technologies. Surveys on the obstacles to the BSGs’ usage in business and economics HEIS in transition countries are scarce, and with this paper we shall try to fill in the gap in this area.

Methodology

SAMPLE DESCRIPTION

Professors, assistant professors and assistants that teach at the business and economics departments of Croatian HEIS are defined as the target population. According to the information provided by the Croatian Agency for Science and Higher Education (ASHE), business and economics departments of Croatian HEIS employed 1349 professors, assistant professors and assistants in academic year 2011/2012, when the survey research was conducted. List of potential participants was developed based on the web-sites of the business and economics departments of Croatian HEIS, where also their e-mail addresses were gathered. The e-mail, sent to the professors, assistant professors and assistants enterprises, was an invitation to take part in the survey. In the invitation mail, hyperlink to the web survey (Google Site tool) was provided. The survey was conducted in the period March–May, 2012, during which potential participants were contacted three times. That approach revealed a response of 152 participants in the research, with the response rate of 11.27%. Such response rate is comparable with the one of Faria and Wellington (2004), who reported 8.39% response rate in their survey.

Sample data on professors, assistant professors and assistants examined (see table 1) indicate the predominance of male participants (57.89%). Besides, assistants prevail in the sample (56.58%), while there is much smaller number of assistant professors (20.39%) and professors (23.03%). In comparison with the characteristics of population, our sample is to some extent biased towards male respondents and assistants. However, chi-square test revealed that these differences are not statistically significant.

TABLE 1 Comparative profile of responding professors and population characteristics

Respondents' characteristics	(1)	(2)	(3)	χ^2	<i>p</i>
<i>Gender</i>					
Male	95	62.50%	57.89%	0.445	0.504
Female	57	37.50%	42.11%		
<i>Academic rank</i>					
Assistants	86	56.58%	44.74%	3.523	0.171
Assistant professors	31	20.39%	30.26%		
Professors	35	23.03%	25.00%		

NOTES Column headings are as follows: (1) number of respondents, (2) percentage of firms, (3) percentage of population.

Professors, assistant professors and assistants participating in the survey are employed on three departments: Computer Science Department (23.68%), Marketing Department (30.26%), Management Department (15.13%), and Trading Department (30.92%). Data on the distribution of the total sample according to the departments is not available to the public.

RESEARCH INSTRUMENT

This research tries to investigate: (1) actual use of BSGs in business and economics departments of HEIs in Croatia, (2) demographic characteristics of BSG users and non-users, and (3) perceived obstacles to BSGs usage. Research was conducted with the usage of the research instrument developed based on the research of Gilgeous and D'Cruz (1996), Lean et al. (2006), and Faria and Wellington (2004). Table 1 presents items used for measuring what obstacles professors perceive regarding BSGs.

STATISTICAL METHODS

Several statistical methods were used in order to attain the goals of the survey. First, chi-square test was deployed in order to test the difference among BSGs users and non-users according to demographic characteristics. Second, chi-square test was deployed in order to test the differences among BSGs users and non-users according to perceived obstacles of BSGs usage. Finally, logistic regression was used in order to examine to what extent both demographic characteristics and perceived obstacles influence the decision on usage or not-usage of BSGs. Logistic regression was used for this purpose due to the reason that dependent variable was

TABLE 2 Research instrument description

Construct	Code	Item
Obstacles to BSGs usage	BSG_OBST1	Lack of funds
	BSG_OBST2	Lack of understanding from the administration
	BSG_OBST3	Considered as not necessary in education
	BSG_OBST4	Insufficient knowledge on the BSGs' usage
	BSG_OBST5	Difficulty in adaption of new technologies
	BSG_OBST6	Difficulty in changing teaching methods

NOTES Adapted from Gilgeous and D'Cruz (1996), Lean et al. (2006), and Faria and Wellington (2004).

defined as categorical binary variable with two outcomes (1-participant in the survey used and/or is using BSGs in their classes; 0-participant in the survey did not use BSGs in their classes).

Results

Aim of the paper was to examine: (1) differences among BSGs users and non-users according to demographic characteristics, (2) differences among BSGs users and non-users according to perceived obstacles of BSGs usage, and (3) impact of both demographic characteristics and perceived obstacles on the decision on usage or not-usage of BSGs.

DIFFERENCES AMONG BSGS USERS AND NON-USERS ACCORDING TO DEMOGRAPHIC CHARACTERISTICS

From the overall number of respondents, 40 respondents (26.32%) have used or are still using BSGs in their classes.

The analysis of the respondents that use the BSGs further indicates that statistically significant difference is present only according to the department, at 1% ($\chi^2 = 78.589$; $p = 0.000$). Computer Science Department have the highest ratio of participants that are using BSGs (75%), and Management Department is close with the 64% of participants that are using BSGs. The analysis of the respondents that use the BSGs further indicates that statistically significant difference is not present according to gender ($\chi^2 = 0.439$; $p = 0.507$) and academic rank ($\chi^2 = 3.792$; $p = 0.155$).

DIFFERENCES AMONG BSGS USERS AND NON-USERS ACCORDING TO PERCEIVED OBSTACLES OF BSGS USAGE

Table 4 shows perceived obstacles to using BSGs as perceived by the respondents according to the usage of BSGs in class. According to usage

TABLE 3 Characteristics of respondents according to usage of BSGs

(1)	(2)	(3)	(4)
<i>Gender</i>			
Male	27 (28%)	68 (72%)	$\chi^2 = 0.439; p = 0.507$
Female	13 (23%)	44 (77%)	Yates' $\chi^2 = 0.247; p = 0.619$
<i>Academic rank</i>			
Assistants	17 (20%)	69 (80%)	$\chi^2 = 3.792; p = 0.155$
Assistant Professors	7 (22%)	24 (78%)	Yates' $\chi^2 = 3.046; p = 0.218$
Professors	11 (31%)	24 (69%)	
<i>Department</i>			
Computer Science	27 (75%)	9 (25%)	$\chi^2 = 78.589; p = 0.000^{***}$
Marketing	13 (28%)	33 (72%)	Yates' $\chi^2 = 75.142; p = 0.000^{***}$
Management	15 (64%)	8 (36%)	
Trade	11 (24%)	36 (76%)	

NOTES Column headings are as follows: (1) characteristics of respondents, (2) using BSGs, (3) not using BSGs, (4) chi-square statistics. *** Statistically significant at 1% level.

TABLE 4 Perceived obstacles to using BSGs as perceived by the respondents according to the usage of BSGs

(1)	(2)	(3)	(4)	(5)
<i>Lack of funds</i>				
(a)	116 (76.32%)	30 (25.86%)	86 (74.14%)	$\chi^2 = 0.094; p = 0.759$
(b)	36 (23.68%)	10 (27.78%)	26 (72.22%)	Yates' $\chi^2 = 0.022; p = 0.882$
<i>Lack of understanding from the administration</i>				
(a)	111 (73.03%)	25 (22.52%)	86 (77.48%)	$\chi^2 = 4.754; p = 0.029^{**}$
(b)	41 (26.97%)	15 (36.59%)	26 (63.41%)	Yates' $\chi^2 = 4.102; p = 0.043^{**}$

Continued on the next page

of BSGs, the respondents were supposed to state if they perceive possible obstacle to using BSGs as important.

Obstacles that most respondents perceive as important are: lack of funds (76.32% perceive as important) and lack of understanding from the administration (73.03% perceive as important). On the other side, obstacles that most respondents do not perceive as important are: considered as (not) necessary in education (68.42%), insufficient knowledge on the BSGs' usage (78.95%), difficulty in adaption of new technologies (81.58%), and difficulty in changing teaching methods (89.47%).

TABLE 4 *Continued from the previous page*

	(1)	(2)	(3)	(4)	(5)
<i>Considered as not necessary in education</i>					
(a)	48 (31.58%)	8 (16.67%)	40 (83.33%)		$\chi^2 = 5.494; p = 0.019^{**}$
(b)	104 (68.42%)	32 (30.77%)	72 (69.23%)		Yates' $\chi^2 = 4.742; p = 0.024^{**}$
<i>Insufficient knowledge on the BSGs' usage</i>					
(a)	32 (21.05%)	0 (0%)	32 (100%)		$\chi^2 = 39.995; p = 0.000^{***}$
(b)	120 (78.95%)	40 (33.33%)	80 (66.67%)		Yates' $\chi^2 = 37.631; p = 0.000^{***}$
<i>Difficulty in adaption of new technologies</i>					
(a)	28 (18.42%)	10 (35.71%)	18 (64.29%)		$\chi^2 = 3.163; p = 0.075^*$
(b)	124 (81.58%)	30 (24.19%)	94 (75.81%)		Yates' $\chi^2 = 2.638; p = 0.104$
<i>Difficulty in changing teaching methods</i>					
(a)	16 (10.53%)	4 (25%)	12 (75%)		$\chi^2 = 0.057; p = 0.811$
(b)	136 (89.47%)	36 (26.47%)	100 (73.53%)		Yates' $\chi^2 = 0.006; p = 0.938$

NOTES Column headings are as follows: (1) Perceived obstacles to using BSGs, (2) *n* (%), (3) using BSGs, (4) not using BSGs, (5) chi-square statistics. *** Statistically significant at 1% level. ** Statistically significant at 5% level. * Statistically significant at 10% level.

Differences among BSGs users and non-users are also presented in table 4. Chi-square indicated that following differences are statistically significant. Non-users of the BSGs perceive following obstacles as more important to the smaller extent compared to users: lack of understanding from the administration at 5% ($\chi^2 = 4.754; p = 0.029$), considered as not necessary in education at 5% ($\chi^2 = 5.494; p = 0.019$), insufficient knowledge on the BSGs' usage at 1% ($\chi^2 = 39.995; p = 0.000$), and difficulty in adaption of new technologies at 10% ($\chi^2 = 3.163; p = 0.075$).

IMPACT OF BOTH DEMOGRAPHIC CHARACTERISTICS AND PERCEIVED OBSTACLES ON THE DECISION ON USAGE OR NOT-USAGE OF BSGS

In order to further clarify the listed perceived obstacles in using BSGs, the logistic regression model was designed with the usage of BSGs as a dependent variable. Results are presented in the table 5, where estimated values for logistic regression parameters are presented.

The data fit the model rather well with R^2 explaining 46% of the variations in usage of BSGs with demographic characteristics and perceptions of perceived obstacles for their usage. Model revealed that gender (male)

TABLE 5 Results of logistic regression model (usage of BSGs – binomial dependent variable)

Model	(1)	(2)	(3)
Academic rank (assistants)	2.146	1.295	0.098*
Academic rank (assistant professors)	2.348	1.116	0.035**
Academic rank (professors)	2.247	1.389	0.086*
Gender (male)	-1.783	1.013	0.078*
Lack of funds	0.921	1.235	0.456
Lack of understanding from the administration	2.156	1.114	0.038**
Considered necessary in education	24.609	24607.120	0.999
Instructions on ways of usage	23.736	14253.950	0.997
Difficulty in adapting to new technologies	2.600	1.261	0.039**
Difficulty in changing classical teaching methods	-0.097	0.993	0.922
Constant	-2.587	1.643	0.115

NOTES Column headings are as follows: (1) regression coefficients, (2) standard errors, (3) significance. ** Statistically significant at 5% level. * Statistically significant at 10% level.

and academic rank (assistants and assistant professors) are significant at 5% and 10% respectively. Perceived obstacles that significantly influence the usage of BSGs are: lack of understanding from the administration at 10% and difficulty in adoption of new technologies at 5%.

Discussions and Conclusions

SUMMARY AND COMPARISON WITH SIMILAR RESEARCH

BSGs improve learning while users are actively involved in educational process using the learning-by-example strategy (Faria 2001). After the BSGs participants analyse all steps and decisions made during the game, they gain increased understanding and additional experience, which is a great help for them in the real business world. Research conducted on the usage of BSGs were primarily oriented towards developed countries (e. g. Faria and Wellington 2004), and this research stems to shed some light on BSGs' usage in developing countries, using Croatia as the example. The results from the survey indicate that BSGs are used 26.32% of interviewed professors from economics and business departments at HEIs in Croatia. This result is comparable with the results with Faria and Wellington (2004) who found out that 30.6% of the USA professors surveyed used BSGs in their teaching. However, one should take into account that our

research was conducted in 2012, while research in USA was conducted in 2003.

Paper attained following goals. First, results revealed that among BSGs' users and non-users there are no statistical differences according to the department. These results confirm other authors' results that also did not found any differences according to gender (Chang 2003). Second, results revealed that BSGs' non-users perceive following obstacles as more important: lack of understanding from the administration, necessity of BSGs in education, insufficient knowledge on the BSGs' usage, and difficulty in adaption of new technologies.

Similar results were obtained by Lean et al. (2006) and Chang (2003), who found out following perceived obstacles as the most important: (i) the time necessary for professors or educators to prepare for a simulation game, (ii) a wrong choice of a simulation game which is not connected with the issue of the course, (iii) lack of knowledge about possibilities to use BSGs, (iv) financial and technical problems. Third, results of the paper revealed that decision on use or not to use BSGs is highly influenced by the gender, academic rank and following perceived obstacles: lack of understanding from the administration and difficulty in adoption of new technologies.

RESEARCH LIMITATIONS AND FURTHER RESEARCH

Since the innovation has become an imperative in achieving competitiveness at all levels it is important to involve BSGs in educational process in business and education in HEIs in Croatia. Therefore, BSGs could improve and modernize teaching methods, which could have a significant impact on improving and enhancing educational system, which would result with satisfied and well educated students.

Results of this research should be evaluated while taking into account relatively small sample of respondents. Therefore, some future work should include other business and economics institutions (e. g. business and economics departments of HEIs in Slovenia, Serbia, Montenegro, Austria, Italy, Czech Republic, and Slovakia). Such research should include in-depth interviews to find out more detailed information from professors who are using or have been using BSGs with their students. Future work should include research with students to understand what they think about BSGs and their usage in learning. Hence, it would be interesting to present selected BSGs in more lectures groups in order to compare and analyse learning results of each group of students.

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