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Evaluation of Use of Business Simulation Games for the Development of Entrepreneurial Competency

Solveiga Skuncikiene, Rasa Balvociute, Remigijus Ciegis

Siauliai University

Abstract

Based on the experience of foreign and Lithuanian scientists, this paper reveals the concept of entrepreneurship and different methods for its evaluation, and analyzes the concept of Business Simulation Game. The paper also presents findings of the evaluative research of using business simulation games for the development of entrepreneurial competency.

Employee training by using business simulation games represents one of the alternative ways for development of their entrepreneurial competency. Employee involvement into business simulation games is assumed to allow them to acquire new knowledge, share experiences, reveal personal characteristics, form new and develop already available skills.

Keywords: business simulation games, entrepreneurial competency, entrepreneurship competency ratio (*VKI*), employee learning.

Introduction

Research problem and relevance. Currently, in search for innovative training techniques and given the constantly increasing demand for business simulation knowledge and skills, business simulation games and their use becomes a relevant object of scientific discussions while focussing on entrepreneurial competency as one of the general personal competencies.

Employee training by using business simulation games represents one of the alternative ways for development of entrepreneurial competency in employees. Employee involvement into business simulation games is assumed to allow them to acquire new knowledge, share experiences, reveal personal characteristics, form new and develop already available skills.

According to Pruskus (2007), business as a mode of activity has many interlinks with a game, since both of them have several playing elements in common, such as competition, risk, free choice and specific rules. The person involved in professional activity is assumed to participate in a real game where he uses his personal characteristics, knowledge and skills for achievement of a particular activity result, however, unlike in a game, he (she) acts in a real environment where a faulty decision can cost an arm and a leg.

In Lithuania, business simulation games represent a rather new and poorly analyzed field, whereas in foreign countries many associations are involved in analysis of business simulation games issues what indicates their popularity in the world of science and practice (Skuncikiene, 2008). According to Bagdonas (2002), business simulation games can be examined in economical, managerial and administrative points of view, when the problem of validity of reality reflection and issue of reliability are analyzed with the aim to train learners to think critically, identify problems and find their solutions.

Greenblat, Duke (1981), Gredler (1992) suggest that business simulation games may be used as an effective technique for gaining new knowledge, development of skills, gaining interest of and motivating employees, adjustment of employees' attitudes, and dealing with problems related to corporate activities. According to Kriz (2001), in a course of business simulation game, a learning environment is generated where a closed social system is created that is approximate to the reality and encouraging to develop skills of communication, cooperation, decision-making and argumentation, leadership and management, time planning, etc., that are needed in a professional activity. Ruohomaki, Jaakola (2000), Kriz (2001) emphasize that using business simulation games for ensuring employee learning represents one of the modern challenges while recognizing importance of the reflective learning in practice and business simulation games for the analysis of the theory.

Despite the increasing interest in using business simulation games in the process of employee learning and evaluation thereof, no particular research aimed at evaluation of use of business simulations games for the development of employee entrepreneurial competency was found.

Based on the experience of foreign and Lithuanian scientists, this paper analyzes the concept of entrepreneurship, its evaluation, and the concept of Business Simulation Game, and presents findings of the evaluative research into using business simulation ga-

mes for the development of entrepreneurial competency.

Research subject: evaluation of use of business simulation games.

Research aim: by using Entrepreneurship Competency Ratio, to make the evaluation of use of business simulation games. To achieve this aim, the following ***objectives*** were set for the research:

- based on the experience of foreign and Lithuanian scientists, to define entrepreneurial competency and its evaluation in the theoretical point of view;
- by using Entrepreneurship Competency Ratio, to perform the evaluative research of use of business simulation games for the development of entrepreneurial competency.

Research methods: scientific literature analysis, analysis and synthesis, comparison, operations of systematization, questionnaire survey, and statistical data analysis.

Entrepreneurial competency and theoretical aspect of its evaluation

Entrepreneurial competency is defined as an integrated competency that is comprised of a set of personal characteristics, professional knowledge, social skills necessary for starting and developing a business. According to Kaufmann, Dant (1998), the term *entrepreneurship* can be interpreted in the following several points of view: by aiming to identify character or personal characteristics specific to an entrepreneur including ability to take risks, leadership, motivation, decision-making and dealing with problems, creativity, etc.; by analyzing business process and its outcomes that include establishment of new enterprises and implementation of innovations in the ever-changing environment; and by explaining the activity of an entrepreneur which involves search for new markets and entrance opportunities, aim to earn profits, management of the organization, etc. According to Zakarevicius (1998), Paulioniene (2007), *entrepreneurship* can be understood as an ability to build economic value-added, i.e., the ability to earn money, attract investment and get potential consumers of products interested in one's activity. In this particular point of view, the entrepreneurial competency is associated with the organization of business and acquisition of fundamental knowledge of economics. Otherwise, this concept can be seen as an ability to build not only economic value-added, but also social value where personal characteristics such as self-confidence, willingness to take risks, critical attitude, logical thinking and receptivity to innovations are needed. Lydeka (1996) is of opinion that entrepreneurship includes inborn and acquired features of a person that allow him to think innovatively, to act proactively and to take risks. According to Ciutiene, Sarkiunaite (2004), a business maker is a person, while business is a result of overcoming obstacles for creative initiative of that person. The ability of a person to make decisions and solve problems is determined not only by his professional expertise, but also by his (her) personal characteristics and social status.

Entrepreneurial competency is associated with the *Plum* competency model distinguishing among social, entrepreneurial and personal competencies, with the general competencies of work, management and business organization distinguished by Jovaisa, Shaw (1998), and with the technical, business management and personal competencies distinguished by Hisriech, Peters (cited in Strazdiene, Garalis, 2006).

Based on the analysis of different studies, entrepreneurial competency can be assumed to be made of the following three structural components: *personal characteristics*, *social skills,* and *knowledge of economics, finance and management* (Skuncikiene, 2008). *Personal characteristics* as a structural component of entrepreneurial competency includes both inherited and acquired personal characteristics of the individual. As Anselm (cited in Strazdiene, Garalis, 2006) reports, some persons are born with the inclination to entrepreneurship, however entrepreneurial level is higher if persons are further taught entrepreneurial competencies. Jack, Anderson (ibid) report that creativity and innovativeness cannot be learnt. Shepherd, Douglas (1997) are, however, of the opposite opinion by suggesting that formation of the previously mentioned characteristics can be encouraged through effective learning process. The inborn or inherent entrepreneurial characteristics include person's temperament, health, intuition, passion, resolution, self-confidence, self-discipline, creativity, innovativeness, etc. (Markevicius, 2002; Lydeka, 1996). Characteristics of creativity and inventiveness are also emphasized as being highly important. The acquired characteristics can be said to include all the personal qualities acquired by an individual through practice while learning or working – i.e., knowledge and practical experience. *Social skills* involve all the skills and abilities required for the individual's successful integration into the social-economic environment, i.e., cooperation, communication, tolerance, partnership, etc., that might by either acquired or inborn and can be developed through interaction with other individuals. *Knowledge of economics, finance and management* is associated with the interprofessional competency identified by Laur-Ernst (1990) while focusing on knowledge of particular subjects (such as economics, management, informatics, etc.).

Employee training through business simulation games represents one of the alternative ways of development of entrepreneurial competency. A business simulation game may also be identified as an environment for development of entrepreneurial competency or as the proactive learning technique of development of entrepreneurial competency (Skuncikiene, 2008). The first approach can be substantiated as follows: essentially, any business simulation game is a physical and dynamical model of the organization and its operation where optimal decisions must be made and interlinks among them and outcomes must be anticipated, i.e., as if simulated business environment is created. Business simulation games may also be used as a training technique both in organizations and in specialized institutions for the development of entrepreneurial competency of employees. Business simulation games enable employees to reveal their personal characteristics, develop social skills and acquire knowledge and skills of economics, finance and management in a quite short period of time.

Business simulation games are considered to be useful for employee training not only as an investment in development of their entrepreneurial competencies, but also as an additional means of motivation that reveal employee reliance on their ability to think individually and allow them to do so while shaping their understanding about corporate goals thus generating a stronger reliance on their skills to achieve those aims.

In this research paper, analysis of the entrepreneurship concept is followed by the analysis of the available evaluation methods of entrepreneurship concept. Kenworthy, Wong (2005) recommend to evaluate the application of business simulation games by using the semi-experimental method that involves testing attitudes of employees and need for knowledge and skills before the business simulation game and testing satisfaction of this need after the game. This approach of Kenworthy, Wong (2005) is further supported by Bagdonas (2002) and Patasiene (2008) by suggesting that if in the stage of evaluation a need for knowledge and skills is found to exist, the goal of the activity can be assumed to be achieved provided that the goal has been to evaluate the level of knowledge and skills. Schumann, Anderson, Scott, Lawton (2001) explain that two different models of evaluation can be used. One of the models suggested by the authors includes testing before and after the business simulation game, and another one – testing only after the business simulation game. Scientists prefer testing before and after the business simulation game as, according to them, this is the only way that the shifts in obtained knowledge and acquired skills can be evaluated best.

A business simulation game is assumed to be an intermediate link between the available knowledge, skills and competencies and the required knowledge, needed skills and competencies. To substantiate this statement, a research into possibilities of using business simulation game for the development of entrepreneurial competency in employees is required.

A presumption is made that employee entrepreneurial competency developed through business simulation games may be evaluated using the *Entrepreneurship Competency Ratio* (VKI) (Skuncikiene, 2008). This ratio is developed under the presumption that entrepreneurial competency of any individual is comprised of three equally important and interrelated components: personal characteristics, social skills and knowledge and skills of economics, finance and management.

Based on the examined scientific literature, it is impossible to differentiate which of the following components is more important – personal characteristics, social skills or professional knowledge and skills of economics, finance and management, since every component of the entrepreneurial competency is equally important and manifests under different circumstances.

$$VKI = \frac{1}{3} AS + \frac{1}{3} SG + \frac{1}{3} \check{Z}G \qquad (1)$$

where *VKI* represents Entrepreneurship Competency ratio;

AS represents Personal Characteristics index;

SG represents Social Skills index;

ŽG represents knowledge and skills of economics, finance and management.

Use of different methods of *VKI* calculation enables to evaluate employee entrepreneurial competency developed through business simulation games in detail in several different respects.

In the first case, in order to evaluate whether the need of employee for entrepreneurial competency is satisfied through business simulation game or not, it is necessary to calculate the *correspondence index that shows the correspondence of entrepreneurial competency developed through business simulation games to the needs of respondents*.

In this case it is assumed that all the personal characteristics, social skills and knowledge and skills of economics, finance and management included in the questionnaire are equally important for respondents in respect of their professional activities. According to Kenworthy, Wong (2005), Bagdonas (2002), Patasiene (2008), in order to evaluate the level of knowledge and skills acquired through business simulation game as well as the level of entrepre-

neurial competency, it is necessary to find out what shifts in knowledge and skills were achieved. For this purpose, shifts in particular personal characteristics, AS_i, social skills, SG_i, and knowledge and skills of economics, finance and management, $ŽG_i$ ($Egž_i$, $Fgž_i$, $Vgž_i$ respectively) are used for calculation of the Entrepreneurial Competency Ratio. Respective shifts in personal characteristics, social skills, and knowledge and skills of economics, finance and management are calculated using percentage frequencies of respondent choices before and after the business simulation game.

Alternative 1

Correspondence index showing correspondence of the revealed personal characteristics to the need of these characteristics, *AS*, may be calculated as follows:

$$AS = \sum_{i=1}^{14} a_i AS_i \qquad (2)$$

where a_i represents a weight of the particular personal characteristic in the index (all the personal characteristics are considered to have equal weights) provided that $\sum_{i=1}^{14} a_i = 1$;

AS_i represents evaluation of the particular personal characteristic.

$$AS_i = \frac{AS_{i\,po} - AS_{i\,prieš}}{100\%} \qquad (3)$$

where AS_i represents a shift in the particular personal characteristic of the respondent in percent;

$AS_{i\,po}$ represents frequency of respondent choice of the particular personal characteristic after the business simulation game;

$AS_{i\,pries}$ represents frequency of respondent choice of the particular personal characteristic before the business simulation game.

Correspondence index of the developed social skills to the needs of those skills, *SG*:

$$SG = \sum_{i=1}^{21} s_i SG_i; \qquad (4)$$

where s_i represents a weight of the particular social skill in the index (all the social skills are considered to have equal weights) provided that $\sum_{i=1}^{21} s_i = 1$;

SG_i represents evaluation of the particular social skill.

$$SG_i = \frac{SG_{i\,po} - SG_{i\,prieš}}{100\%} \qquad (5)$$

where SG_i represents a percentage shift in the particular social skill;

$SG_{i\,po}$ represents frequency of respondent choice of the particular social skill after the business simulation game;

$SG_{i\ pries}$ represents frequency of respondent choice of the particular social skill before the business simulation game.

Correspondence index of the acquired knowledge and skills of economics, finance and management to the needs of those knowledge and skills, *ŽG*:

$$ŽG = Egž + Fgž + Vgž \qquad (6)$$

Correspondence indexes of the acquired knowledge and skills of economics, finance and management to the needs of those knowledge and skills *Egž*, *Fgž*, *Vgž* are calculated respectively:

$$Egž = \sum_{i=1}^{9} e_i Egž_i,\ Fgž = \sum_{i=1}^{8} f_i Fgž_i,$$
$$Vgž = \sum_{i=1}^{9} v_i Vgž_i \qquad (7)$$

where e_i, f_i, v_i represent respective weights of particular knowledge and skills of economics, finance and management in the index (all respective knowledge and skills of economics, finance and management are considered to have equal weights) provided that

$$\sum_{i=1}^{9} e_i = 1,\ \sum_{i=1}^{8} f_i = 1,\ \sum_{i=1}^{9} v_i = 1$$

$Egž_i$, $Fgž_i$, $Vgž_i$ represent respective evaluations of particular knowledge and skills of economics, finance and management.

$$Egž_i = \frac{Egž_{i\,po} - Egž_{i\,prieš}}{100\%},$$
$$Fgž_i = \frac{Fgž_{i\,po} - Fgž_{i\,prieš}}{100\%},$$
$$Vgž_i = \frac{Vgž_{i\,po} - Vgž_{i\,prieš}}{100\%} \qquad (8)$$

where $Egž_i$, $Fgž_i$, $Vgž_i$ represent respective percentage shifts in particular knowledge and skills of economics, finance and management;

$Egž_{i\,po}$, $Fgž_{i\,po}$, $Vgž_{i\,po}$ represent respective frequencies of respondent choice of the particular knowledge and skills of economics, finance and management after the business simulation game;

$Egž_{i\,pries}$, $Fgž_{i\,pries}$, $Vgž_{i\,pries}$ represent respective frequencies of respondent choice of the particular knowledge and skills of economics, finance and management before the business simulation game.

If the calculated value of *VKI* is equal to 0, business simulation game can be claimed to satisfy the need for entrepreneurial competency, i.e., in a course of business simulation game, employees are enabled to reveal such personal characteristics, develop such social skills and acquire such professional knowledge and skills that are actually needed in their professional activities.

If the calculated value of *VKI* is close to –1, the business simulation game can be claimed not to satisfy the need for entrepreneurial competency.

If the calculated value of *VKI* is close to 1, business simulation game can be claimed to reveal such personal characteristics, develop such social skills and acquire such professional knowledge and skills the need for which was not identified by respondents.

Alternative 2

Entrepreneurial competency developed through business simulation games may also be evaluated by calculating *the entrepreneurship competency index depending on the importance of needs*, VKI_p. This evaluation technique is developed under presumption that it is important to evaluate whether the business simulation game enables employees to reveal such personal characteristics, acquire such social skills and obtain such knowledge and skills of economics, finance and management that are needed in their professional activities. In this particular case, determination of the percentage shifts in employee personal characteristics, social skills and knowledge and skills of economics, finance and management are excluded from the calculation of entrepreneurship competency index.

$$VKI_p = \frac{1}{3} AS_p + \frac{1}{3} SG_p + \frac{1}{3} \check{Z}G_p \qquad (9)$$

where indexes of personal characteristics (AS_p), social skills (SG_p), and knowledge and skills of economics, finance and management ($\check{Z}G_p$), respectively, must be calculated depending on the importance of needs.

Personal characteristics index depending on the importance of needs, AS_p, is calculated as follows:

$$AS_p = \sum_{i=1}^{14} a_i AS_{i\,po} / 100\% \qquad (10)$$

where $AS_{i\,po}$ represents evaluation of the particular personal characteristic after the business simulation game;

a_i represents weight of the particular personal characteristic in the index

$$a_i = \frac{AS_{i\,prieš}}{\sum_{n=1}^{14} AS_{i\,prieš}} \qquad (11)$$

$AS_{i\,pries}$ represents frequency of respondents' choice of the particular personal characteristic before the business simulation game;

The condition that $\sum_{i=1}^{14} a_i = 1$ holds.

Social skills index depending on the importance of needs, SG_p, is calculated as follows:

$$SG_p = \sum_{i=1}^{21} s_i SG_{i\,po} / 100\% \qquad (12)$$

where $SG_{i\,po}$ represents evaluation of the particular social skill after the business simulation game;

s_i represents weight of the particular social skill in the index

$$s_i = \frac{SG_{i\,prieš}}{\sum_{n=1}^{21} SG_{i\,prieš}} \qquad (13)$$

$SG_{i\,pries}$ represents frequency of respondent choice of the particular social skill before the business simulation game;

The condition that $\sum_{i=1}^{21} s_i = 1$ holds.

Knowledge and skills of economics, finance and management index depending on the importance of needs, $\check{Z}G_p$, is calculated as follows:

$$\check{Z}G_p = Egž_p + Fgž_p + Vgž_p \qquad (14)$$

First of all, respective knowledge and skills of economics, finance and management indexes depending on the importance of needs, $Egž_p$, $Fgž_p$, $Vgž_p$, must be calculated as follows:

$$Egž_p = \sum_{i=1}^{9} e_i Egž_{i\,po} / 100\%,$$

$$Fgž_p = \sum_{i=1}^{8} f_i Fgž_{i\,po} / 100\%,$$

$$Vgž_p = \sum_{i=1}^{9} v_i Vgž_{i\,po} / 100\% \qquad (15)$$

where respective weights of particular knowledge and skills of economics, finance and management, e_i, f_i, v_i, in the index are calculated as follows:

$$e_i = \frac{Egž_{i\,prieš}}{\sum_{n=1}^{9} Egž_{i\,prieš}}, \; f_i = \frac{Fgž_{i\,prieš}}{\sum_{n=1}^{8} Fgž_{i\,prieš}},$$

$$v_i = \frac{Vgž_{i\,prieš}}{\sum_{n=1}^{9} Vgž_{i\,prieš}} \qquad (16)$$

$Egž_{i\,po}$, $Fgž_{i\,po}$, $Vgž_{i\,po}$, represent respective evaluations of particular knowledge and skills of economics, finance and management after the business simulation game;

under the conditions that $\sum_{i=1}^{9} e_i = 1, \sum_{i=1}^{8} f_i = 1, \sum_{i=1}^{9} v_i = 1,$ respectively.

If the calculated value of the index is close to 1, the business simulation game can be claimed to satisfy the need for entrepreneurial competency, i.e., in a course of business simulation game, employees are enabled to reveal such personal characteristics, develop such social skills and acquire such professional knowledge and skills that are actually needed in their professional activities

If the calculated value of the index is equal to 0, the business simulation game can be claimed not to satisfy or to insufficiently satisfy the need for entrepreneurial competency.

With reference to the four-level evaluation model developed by Kirkpatrick (1998), it is assumed that evaluation process besides the evaluation of entrepreneurial competency may also include evaluation of employee's response to learning process, use of the acquired entrepreneurial competency in his (her) professional activity and change of corporate performance due to employee learning.

- *Response evaluation*. At this level, it can be found out whether employees liked business simulation game, how useful training programme was, etc. Such an evaluation is assumed to be rather subjective, however it may indicate whether employees are willing to directly apply knowledge acquired through business simulation game in their work. Positive employee's response may serve as a strong stimulus to transfer acquired knowledge and skills into professional activity. However, positive employee's response to learning process does not necessarily reflect that employee will successfully use what he (she) has learnt in his (her) professional activity and contribute to improvement of corporate performance.
- *Behaviour evaluation* enables to determine how employee behaviour was changed by business simulation game in the workplace. According to Higgs, Rowland (2001), employee behaviour, i.e., application of knowledge and skills acquired through business simulation game in the professional activity, should be evaluated only after some period of time after the training. These scientists perform employee competency evaluation before the business simulation game and after 8–10 weeks after the business simulation game. This gives the most precise evaluation of what competencies acquired through training are practically used by employees in their professional activities.
- *Performance evaluation* includes evaluation of employee performance (increased productivity, higher quality, lower employee turnover, etc.). Change of corporate performance due to use of business simulation games for employee learning requires detailed analysis of corporate financial ratios that can be done only after some period following the employee training.

In the scientific literature it is unanimously recognized that evaluation of the training impact on changes in corporate performance is one of the most interesting but at the same time most difficult levels of evaluation of training efficiency (for example, return on funds allocated to training may be calculated, etc.) (Pundziene, Dienys, 2003). Difficulty of this level of evaluation is determined by the fact that changes in corporate performance are determined not only by knowledge and skills acquired by individual employees, but particular influence may be occur due to many internal and external factors that affect corporate performance. According to Guskey (2004), evaluation aspects that have been discussed above are common and often used for evaluation of employee learning-training process. Scientific literature presents many attitudes and suggestions that it should be useful to determine the ultimate value of training expressed in corporate success criteria, such as economic advantage, human welfare, and social value.

General characteristics of the research

To perform an evaluative study into use of business simulation games for the development of entrepreneurial competency by using the Entrepreneurship Competency Ratio, an empirical research was carried out in a period of September, 2007 – March, 2008.

An anonymous questionnaire survey was used as the tool for the research. The questionnaire survey was performed in the following two stages: before the business simulation game the research was undertaken with the aim to find out the need for entrepreneurial competency, and after the business simulation game – to find out if employees' personal characteristics, social skills and knowledge of economics, finance and management that is needed in their professional activities is revealed through business simulation game.

Most of the questions included in the questionnaire were of the closed or semi-closed type. Respondents' opinions were assessed mainly by using Likert scale where respondents had to assess the presented statements in respective graded scales (with options *always, often, sometimes, never,* and *don't know*). Demographic data of respondents was gathered using nominal and interval scales.

Research involved 237 respondents working at organizations of different sizes and types that had experience of participating in one or more business simulation games. Geographical scope of the research encompassed Klaipeda, Kaunas, Vilnius and Siauliai regions.

EkoSys was one of the business simulation games used for the research, the model of which spanned economy of a single country. Business simulation game *EkoSys* was developed on the initiative of Ernst Schmidheiny Fund in 1993 in Switzerland, and on the initiative of Baltic Net Centre it has been applied in Lithuania since 2001. This business simulation game is realized in the following manner: participants working in teams make decisions and register them in decision lists. Instructors enter decisions made into to the specific computer application that processes data and outputs new information to learners. The application is also capable of providing additional information about the performance level achieved by individual groups and producing graphical charts.

Other business simulation games used in the research were developed in accordance with the *CELEMI* technique in Sweden (author – Mellander (1993)). These are the table business simulation games that allow participants not to go into guessing about the arrangement of their organization as of system, but to realistically feel it themselves, as participants' senses of sight, hearing and touching are integrated in a course of such learning. Employees learn from each other through communication and analysis of realistic cases and situations often faced by organizations.

Analysis of demographic data showed the following respondent distribution by gender: 76 men (32 percent) and 161 women (68 percent) were interviewed. Distribution of respondents by age was the following: 18-25 year old (22.5 percent), 26–35 year old (23.7 percent), 36–45 year old (21.6 percent), 46–55 year old (22.9 percent), and 56 and more year old (9.3 percent). The majority of respondents (as much as 65.8 percent) had university education. All the respondents were grouped into the following two large groups depending on the positions they occupy: white-collar workers (48.5 percent) and managers (26.8 percent). More than half of the interviewed respondents worked in the public sector (64.5 percent) and only 29.4 percent worked in the private sector.

In summary of demographic data of respondents, the conclusion was drawn that the majority of the respondents were white-collar workers with the university education working in public sector.

Findings of research into business simulation games as of the tool for development of entrepreneurial competency

Research into use of business simulation games for the development of employee entrepreneurial competency involved calculation of *the entrepreneurship competency index depending on the importance of needs*, VKI_p. This evaluation technique is developed under presumption that it is important to evaluate whether the business simulation game enables employees to reveal such personal characteristics, acquire such social skills and obtain such knowledge and skills of economics, finance and management that are actually needed in their professional activities. In this particular case, there was no need to determine and assess shifts in personal characteristics, social skills, and knowledge and skills of economics, finance and management. When calculating each index, AS_p, SG_p, and $\check{Z}G_p$, these personal characteristics, social skills, and knowledge and skills of economics, finance and management that were found to be most needed (percentage frequencies of respondent choice before the business simulation game) were respectively given greater weights.

If the calculated value of the index is close to 1, business simulation game can be claimed to have satisfied the need for entrepreneurial competency, i.e., business simulation game enabled employees to reveal such personal characteristics, develop such social skills and acquire such professional knowledge and skills that are actually needed in their professional activities.

If, however, the calculated value of the index is close to 0, business simulation game can be claimed not to have satisfied or to have satisfied the need for entrepreneurial competency less. Table 1 presents values of the calculated personal characteristics index depending on the importance of needs, AS_p, for different business simulation games.

Table 1

Personal Characteristics Index Depending on the Importance of Needs, AS_p

	Business Simulation Game *Decision Base*		**Business Simulation Game *Apples and Orange***		**Business Simulation Game *Cayenne***		**Business Simulation Game *Tango***		**Business Simulation Game *EkoSys***	
Personal Characteristics	a_i	$AS_{i\,po}$	a_i	$AS_{i\,po}$	a_i	$AS_{i\,po}$	a_i	$AS_{i\,po}$	a_i	$AS_{i\,po}$
Insistency	0.020	0.018	0.016	0.014	0.107	0.088	0.021	0.019	0.063	0.056
Activeness	0.039	0.036	0.048	0.046	0.062	0.059	0.053	0.050	0.037	0.036
Analytical thinking	0.078	0.072	0.048	0.046	0.026	0.026	0.063	0.060	0.058	0.057
Communication	0.059	0.054	0.063	0.061	0.040	0.039	0.053	0.050	0.042	0.041
Diplomacy	0.059	0.054	0.064	0.064	0.062	0.056	0.053	0.053	0.084	0.078
Charisma	0.137	**0.112**	0.224	**0.177**	0.040	0.025	0.222	**0.183**	0.147	**0.106**
Initiative taking	0.039	0.033	0.031	0.030	0.097	0.088	0.032	0.030	0.051	0.050
Prompt orientation in critical situation	0.039	0.033	0.048	0.046	0.101	0.089	0.063	0.060	0.062	0.061
Creativity	0.118	**0.099**	0.095	0.084	0.079	0.071	0.116	**0.103**	0.116	**0.111**
Flexibility	0.078	0.072	0.095	**0.092**	0.101	**0.096**	0.063	0.060	0.072	0.070
Motivation	0.118	**0.109**	0.095	**0.092**	0.122	0.111	0.095	0.092	0.097	0.093
Self-discipline	0.039	0.036	0.032	0.031	0.044	0.042	0.021	0.020	0.054	0.053
Tolerance	0.118	**0.109**	0.095	0.088	0.079	0.075	0.105	0.096	0.081	0.078
Self-reliance	0.059	0.054	0.048	0.046	0.044	0.039	0.042	0.040	0.033	0.032
Total:		0.893		0.901		0.815		0.895		0.866
AS_{po}		**0.295**		**0.297**		**0.269**		**0.295**		**0.286**

Where $AS_{i\,po}$ represents evaluation of the particular personal characteristic after the business simulation game, and a_i represents weight of the particular personal characteristic in the index.

As data in Table 1 shows, charisma is the personal characteristic best developed through every business simulation game, with the exception of *Cayenne*; business simulation games *Decision Base*, *Tango* and *Ekosys* develop creativity in employees; and games *Apples and Orange*, *Cayenne* contribute to development of flexibility.

In summary, all the researched business simulation games that are used for the development of entrepreneurial competency of employees reveal such personal characteristics that are actually needed in their professional activities as well as personal characteristics that, according to respondents, are needed less.

Table 2 presents values of the calculated social skills indexes depending on the importance of needs, SG_p, after different business simulation games. Analysis of the calculated social skills indexes depending on the importance of needs, after different business simulation games, leads to the conclusion that respondents' needs for social skills were insufficiently satisfied through every business simulation game concerned when compared to the satisfaction of respondents' need for personal characteristics.

Table 2

Social Skills Index Depending on the Importance of Needs, SG_p

	Business Simulation Game *Decision Base*		**Business Simulation Game *Apples and Orange***		**Business Simulation Game *Cayenne***		**Business Simulation Game *Tango***		**Business Simulation Game *EkoSys***	
Social Skills	s_i	$SG_{i\,po}$	s_i	$SG_{i\,po}$	s_i	$SG_{i\,po}$	s_i	$SG_{i\,po}$	s_i	$SG_{i\,po}$
Teamwork	0.049	0.008	0.050	0.006	0.043	0.001	0.051	0.006	0.036	0.002
Cooperation	0.053	0.008	0.054	0.006	0.039	0.001	0.053	0.006	0.028	0.002

Continued Table 2

Communication	0.053	0.008	0.052	0.006	0.040	0.001	0.051	0.006	0.031	0.002
Leadership and management	0.040	0.003	0.045	0.002	0.045	0.015	0.045	0.002	0.063	**0.010**
Practical work	0.040	0.012	0.049	0.009	0.046	**0.018**	0.049	0.007	0.028	0.002
Problem identification and solution	0.045	0.014	0.045	0.007	0.039	0.007	0.049	0.009	0.036	0.004
Analyzing causes and outcomes of the decisions made	0.043	**0.020**	0.047	0.013	0.043	0.006	0.049	**0.012**	0.040	0.000
Knowledge integration and search for rational solutions in the activity	0.045	0.003	0.051	0.002	0.045	0.008	0.049	0.003	0.054	0.001
Activity forecasting	0.045	0.003	0.050	0.002	0.043	0.004	0.048	0.001	0.055	0.003
Argumentation of decisions	0.058	0.004	0.054	0.006	0.041	0.005	0.054	0.004	0.045	0.004
Negotiation	0.049	**0.023**	0.047	**0.016**	0.058	0.013	0.047	**0.015**	0.055	0.008
Work routine planning and organizing	0.049	0.011	0.045	0.007	0.041	0.012	0.046	0.007	0.044	0.004
Time planning	0.036	0.008	0.041	0.006	0.040	0.012	0.040	0.006	0.038	0.003
Preparation and implementation of projects	0.053	**0.025**	0.040	0.012	0.052	0.016	0.042	**0.012**	0.062	**0.015**
Using basic concepts of economics, finance and management	0.053	**0.024**	0.049	0.011	0.053	**0.035**	0.049	0.009	0.061	**0.015**
Analyzing business situations	0.053	**0.021**	0.047	0.007	0.072	0.018	0.045	0.009	0.052	0.009
Thinking and search for non-standard solutions	0.058	0.018	0.052	0.012	0.049	0.007	0.051	0.010	0.055	0.004
Individual work	0.045	0.017	0.051	0.014	0.042	0.013	0.052	0.013	0.033	0.005
Emotional control	0.049	0.011	0.049	0.009	0.047	0.019	0.051	0.011	0.051	**0.012**
Oratory	0.040	0.015	0.042	0.011	0.059	0.018	0.040	0.010	0.061	0.010
Presentations in public	0.045	0.017	0.039	0.011	0.065	0.020	0.039	0.010	0.071	**0.012**
Total:		0.275		0.176		0.250		0.167		0.126
SG_p		**0.091**		**0.058**		**0.082**		**0.055**		**0.042**

Where SG_{ipo} represents evaluation of the particular social skill after the business simulation game, and s_i represents weight of the particular social skill in the index.

It was found that the need for social skills such as analyzing causes and outcomes of the decisions made, negotiation, preparation and implementation of projects, using basic concepts of economics, finance and management, and analyzing business situations was best satisfied through business simulation game *Decision Base*. Comparison of the calculated social skills indexes depending on the importance of needs after the researched business simulation games suggests that the need for social skills could have been best satisfied by employees through business simulation games *Decision Base* and *Cayenne* (see Table 2).

To calculate index of knowledge and skills of economics, finance and management, depending on the importance of needs, first of all individual indexes of knowledge and skills of economics, finance and management must be calculated depending on the importance of needs. Table 3 presents calculated values of knowledge and skills of economics index depending on the importance of needs.

Table 3

Knowledge and Skills of Economics Index Depending on the Importance of Needs, $Egž_p$

	Business Simulation Game *Decision Base*		**Business Simulation Game *Apples and Orange***		**Business Simulation Game *Cayenne***		**Business Simulation Game *Tango***		**Business Simulation Game *EkoSys***	
Knowledge and skills of economics	e_i	$Egž_{ipo}$	e_i	$Egž_{ip}$	e_i	$Egž_{ip}$	e_i	$Egž_{ip}$	e_i	$Egž_{ip}$
Understanding and use of basic concepts of economics	0.108	0.075	0.124	0.062	0.077	0.07	0.118	0.057	0.09	0.061

Continued Table 3

Understanding, analyzing, planning and management of a process of production	0.093	0.050	0.107	0.045	0.130	**0.11**	0.109	0.044	0.12	0.056
Understanding, analyzing, planning and management of a process of service development and delivery	0.124	0.095	0.071	0.030	0.113	**0.1**	0.096	0.041	0.1	0.057
Understanding key principles of operation of national economy	0.124	**0.114**	0.136	**0.110**	0.077	0.07	0.125	**0.094**	0.12	0.057
Understanding key principles of operation of main business entities	0.117	0.099	0.136	0.094	0.108	0.09	0.128	0.083	0.1	0.061
Attraction and management of investment	0.124	**0.105**	0.129	**0.098**	0.136	**0.13**	0.125	0.083	0.14	**0.097**
Achieving optimal performance with limited capacities and financial resources	0.046	0.025	0.071	0.033	0.078	0.05	0.066	0.027	0.10	0.048
Understanding principles of lending and saving	0.139	**0.118**	0.130	0.080	0.147	**0.14**	0.128	0.072	0.14	0.088
Understanding principles of pricing	0.124	**0.124**	0.097	0.060	0.134	**0.13**	0.107	0.066	0.1	0.067
Total:		0.805		0.611		0.88		0.569		0.591
$Egž_p$		**0.09**		**0.067**		**0.1**		**0.063**		**0.07**

Where $Egž_{po}$ represents evaluation of the particular knowledge and skills of economics after the business simulation game, and e_i represents weight of the particular knowledge and skills of economics in the index.

Analysis of the calculated values of knowledge and skills of economics index depending on the importance of needs suggests that business simulation games such as *Decision Base*, *Apples and Orange,* and *Tango* enabled employees to acquire knowledge about the key principles of operation of national economy, as well as knowledge and skills of attraction and management of investment; business simulation games *Decision Base* and *Cayenne* – knowledge on lending and saving, and pricing (see Table 3). The need for knowledge and skills of economics was best satisfied in a course of business simulation game *Cayenne*.

Table 4 presents calculated values of knowledge and skills of finance index depending on the importance of needs.

Analysis of the calculated values of knowledge and skills of finance index depending on the importance of needs leads to observation that business simulation game *Cayenne* proved to be best at enabling employees to satisfy their needs for professional knowledge and skills of finance, as it showed the highest value of the index (0.106) when compared to the calculated values of indexes of other business simulation games. It is also obvious that business simulation games enabled respondents to acquire knowledge and skills of attraction of financial funds (see Table 4).

Table 4

Knowledge and Skills of Finance Index Depending on the Importance of Needs, $Fgž_p$

	Business Simulation Game *Decision Base*		**Business Simulation Game *Apples and Orange***		**Business Simulation Game *Cayenne***		**Business Simulation Game *Tango***		**Business Simulation Game *EkoSys***	
Knowledge and skills of finance	f_i	$Fgž_{ipo}$	f_i	$Fgž_{ipo}$	f_i	$Fgž_{ipo}$	f_i	$Fgž_{ipo}$	f_i	$Fgž_{ipo}$
Understanding and using basic concepts of finance	0.136	**0.115**	0.121	0.075	0.118	**0.113**	0.123	0.076	0.105	0.079
Understanding and analyzing Balance-Sheet and Profit and Loss Account	0.119	0.082	0.130	0.055	0.120	**0.117**	0.116	0.056	0.111	0.082
Arranging and using accounting documentation	0.119	**0.110**	0.114	0.075	0.125	**0.124**	0.116	0.075	0.135	**0.111**
Analyzing financial information	0.119	**0.110**	0.121	0.084	0.087	0.085	0.124	**0.084**	0.119	0.075
Analyzing financial ratios	0.119	0.091	0.121	0.079	0.095	0.093	0.125	0.078	0.120	0.067
Analyzing financial sources	0.119	**0.100**	0.128	**0.089**	0.100	0.098	0.130	**0.084**	0.126	0.083

Continued table 4

Attracting financial funds	0.153	**0.129**	0.135	**0.089**	0.188	**0.180**	0.139	**0.086**	0.146	**0.101**
Cash flow management	0.119	0.089	0.128	0.069	0.167	**0.155**	0.128	0.064	0.139	0.085
Total:		0.826		0.614		0.967		0.604		0.683
$Fgž_p$		**0.091**		**0.068**		**0.106**		**0.066**		**0.075**

Where $Fgž_{i\,po}$ represents evaluation of the particular knowledge and skills of finance after the business simulation game, and f_i represents weight of the particular knowledge and skills of finance in the index.

Table 5 presents calculated values of knowledge and skills of management index depending on the importance of needs.

Table 5

Knowledge and Skills of Management Index Depending on the Importance of Needs, $Vgž_p$

	Business Simulation Game *Decision Base*		**Business Simulation Game *Apples and Orange***		**Business Simulation Game *Cayenne***		**Business Simulation Game *Tango***		**Business Simulation Game *EkoSys***	
Knowledge and skills of management	v_i	$Vgž_{i\,po}$	v_i	$Vgž_{i\,po}$	v_i	$Vgž_{i\,po}$	v_i	$Vgž_{i\,po}$	v_i	$Vgž_{i\,po}$
Understanding interlinks among departments of the organization	0.073	0.039	0.093	0.039	0.076	0.056	0.084	0.034	0.098	0.057
Creative dealing with problems and decision-making	0.109	0.067	0.073	0.034	0.062	0.039	0.070	0.028	0.077	0.026
Analysis and selection of marketing means	0.182	**0.154**	0.176	**0.109**	0.148	**0.132**	0.161	0.083	0.111	0.067
Personnel management	0.091	0.063	0.083	0.038	0.115	**0.094**	0.098	0.048	0.129	**0.090**
Preparation and implementation of projects	0.109	**0.093**	0.135	**0.098**	0.113	0.053	0.123	0.086	0.129	**0.090**
Short-term and long-term (strategic) decision making	0.109	0.050	0.114	0.055	0.100	0.079	0.119	0.056	0.100	0.054
Ability to manage and run organization	0.127	**0.118**	0.119	0.087	0.142	**0.122**	0.134	**0.098**	0.132	**0.092**
Planning, arrangement and control of the operation	0.091	0.049	0.073	0.033	0.069	0.052	0.077	0.038	0.109	0.071
Analysis of competitors	0.109	**0.092**	0.135	0.078	0.174	**0.160**	0.133	0.076	0.115	0.073
Total:		0.726		0.571		0.787		0.546		0.621
$Vgž_p$		**0.080**		**0.06**		**0.087**		**0.06**		**0.068**

Where $Vgž_{i\,po}$ represents evaluation of the particular knowledge and skills of management after the business simulation game, and v_i represents weight of the particular knowledge and skills of management in the index.

It was observed that most of the professional knowledge and skills of management were acquired by respondents through business simulation games *Decision Base* and *Cayenne* (respective values of indexes were 0.08 and 0.087); in a course of those business simulation games, learning employees were mainly involved in analysis of marketing tools selection, acquired abilities to manage and run organization and skills of competitors' analysis (see Table 5). During business simulation games *Decision Base*, *Apples and Orange,* and *EkoSys* respondents had also an opportunity to prepare and implement projects (respective values of indexes were 0.093, 0.098, and 0.090).

Table 6 presents generalized values of entrepreneurship competency ratio depending on the importance of the need, calculated for different business simulation games. The obtained values of ratios suggest that business simulation games *Decision Base* and *Cayenne* proved to be best at satisfying need for entrepreneurial competency (with the ratio value of 0.64) when compared to other business simulation games, namely *Apples and Orange*, *Tango*, and *EkoSys* (see Table 6).

Table 6

Entrepreneurship Competency Ratio Depending on the Importance of Need, VKI_p

Business Simulation Game	Values of Entrepreneurship Competency Ratio, VKI_p, depending on the importance of need
Decision Base	**0.64**
Apples and Orange	0.55
Cayenne	**0.64**
Tango	0.54
EkoSys	0.54

Business simulation games *Decision Base* and *Cayenne* were found to reveal such personal characteristics, to develop such social skills and to provide such knowledge and skills of economics, finance and management that are most necessary in employees' professional activities.

Calculation of entrepreneurship competency ratio and evaluation of entrepreneurial competencies of employees after different business simulation games suggest that business simulation games may be used as a training tool for entrepreneurial competency development in employees.

Conclusions

1. Entrepreneurial competency is defined as the integrated competency that involves a set of personal characteristics, professional knowledge, and social skills needed for starting and developing a business. Possession of entrepreneurial competency is assumed to enable a person to adapt easier to requirements of modern labour market and to use effectively individual's potential, what directly helps organizations to survive in a highly competitive environment.
2. Business Simulation Game is assumed to be a model of operation, used by employees for analysis of real or simulated economical, financial or managerial issues of the organization.
3. A presumption is made that employees' entrepreneurial competency developed through business simulation games may be evaluated using the Entrepreneurship Competency Ratio (*VKI*). This ratio is developed under presumption that entrepreneurial competency of any individual is comprised of three equally important and interrelated components: personal characteristics, social skills and knowledge and skills of economics, finance and management.
4. Calculation of entrepreneurship competency ratio and evaluation of entrepreneurial competencies of employees after different business simulation games suggest that business simulation games may be used as a training tool for development of entrepreneurial competency in employees. Findings of the research performed indicate that using all the business simulation games included in the research, employees are enabled to reveal such personal characteristics that are actually needed in their work, as well as personal characteristics that, according to respondents, are required less; the need of employees for social skills remains not fully satisfied or undersatisfied; employees are enabled to acquire knowledge and skills of economics, finance and management that are actually needed in their professional activities.

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S. Skunčikienė, R. Balvočiūtė, R. Čiegis

Imitacinių verslo žaidimų taikymo verslumo kompetencijos vystymui vertinimas

Santrauka

Dabar, ieškant inovatyvių darbuotojų mokymo metodų bei didėjant verslo modeliavimo žinių ir įgūdžių paklausai, aktualiu mokslinių diskusijų objektu tampa imitaciniai verslo žaidimai ir jų taikymas darbuotojų mokymuisi, akcentuojant verslumo kompetenciją, kaip vieną asmens bendrųjų kompetencijų.

Vienas verslumo kompetencijos vystymo būdų yra darbuotojų mokymas taikant imitacinius verslo žaidimus. Manoma, kad darbuotojams, dalyvaujantiems imitaciniame verslo žaidime, sudaromos sąlygos įgyti naujų žinių, pasidalyti patirtimi, atskleisti savo asmenines savybes, formuoti naujus ir vystyti turimus gebėjimus. Nepaisant didėjančio susidomėjimo imitacinių verslo žaidimų taikymu darbuotojų mokymosi procese ir jų vertinimu, konkretaus tyrimo, kurio tikslas būtų įvertinti imitacinių verslo žaidimų taikymą darbuotojų verslumo kompetencijos vystymui, nerasta.

Šiame straipsnyje, remiantis užsienio ir Lietuvos mokslininkų patirtimi, analizuojama verslumo kompetencija ir jos vertinimas, imitacinio verslo žaidimo samprata, pateikiami atlikto imitacinių verslo žaidimų taikymo verslumo kompetencijos vystymui vertinamojo tyrimo rezultatai.

Tyrimo objektas – imitacinių verslo žaidimų taikymo vertinimas.

Tyrimo tikslas – atlikti imitacinių verslo žaidimų taikymo vertinimą naudojant verslumo kompetencijos indeksą.

Tyrimo tikslui pasiekti suformuluoti tokie ***tyrimo uždaviniai:***
- remiantis užsienio ir Lietuvos mokslininkų patirtimi, apibrėžti verslumo kompetenciją ir jos vertinimą teoriniu aspektu;
- atlikti imitacinių verslo žaidimų taikymo verslumo kompetencijos vystymui vertinamąjį tyrimą naudojant verslumo kompetencijos indeksą.

Siekiant atlikti imitacinių verslo žaidimų taikymo verslumo kompetencijos vystymui vertinamąjį tyrimą naudojant verslumo kompetencijos indeksą, 2007 m. rugsėjo mėn. – 2008 m. kovo mėn. atliktas empirinis tyrimas.

Tyrimo instrumentas – anoniminė anketa. Anketinė apklausa buvo vykdoma dviem etapais: prieš imitacinį verslo žaidimą buvo siekiama nustatyti verslumo kompetencijos poreikį, po imitacinio verslo žaidimo buvo siekiama išsiaiškinti, ar imitacinio verslo žaidimo metu yra atskleidžiamos profesinėje veikloje reikiamos darbuotojo asmeninės savybės, įgyjami reikiami įgūdžiai, ekonomikos, finansų ir vadybos žinios. Daroma prielaida, kad imitacinių verslo žaidimų metu vystomą darbuotojų verslumo kompetenciją galima vertinti naudojant verslumo kompetencijos indeksą *VKI*, kuris sudaromas laikantis nuostatos, kad asmens verslumo kompetenciją sudaro trys lygiavertės, viena su kita susijusios sudedamosios dalys: asmeninės savybės, socialiniai gebėjimai bei ekonomikos, finansų ir vadybos sričių žinios ir gebėjimai.

Tyrimo metu apklausti 237 respondentai, dirbantys

įvairaus dydžio ir tipo organizacijose, dalyvavę viename arba keliuose imitaciniuose verslo žaidimuose. Tyrimo geografija apėmė Klaipėdos, Kauno, Vilniaus ir Šiaulių apskritis.

Analizuojant ir interpretuojant empirinio tyrimo duomenis, buvo nustatyta, kad taikant imitacinius verslo žaidimus, kaip darbuotojų mokymosi priemonę, galima vystyti darbuotojų verslumo kompetenciją. Atlikto tyrimo rezultatai rodo, kad naudojant visus tyrimo metu taikomus imitacinius verslo žaidimus, darbuotojai gali atskleisti tas asmenines savybes, kurių jiems reikia jų tiesioginiame darbe, ir tas, kurių, jų nuomone, reikia mažiau. Darbuotojų socialinių gebėjimų poreikis nėra visiškai arba yra mažiau patenkinamas. Darbuotojai gali įgyti profesinėje veikloje reikiamų ekonomikos, finansų bei vadybos žinių ir gebėjimų.

Pagrindiniai žodžiai: verslo imitaciniai žaidimai, verslumo kompetencija, verslumo kompetencijos indeksas, darbuotojų mokymasis.