Management Dynamics in the Knowledge Economy
Vol.6 (2018) no.2, pp.265-284; DOI 10.25019/MDKE/6.2.05
ISSN 2392-8042 (online)

Factorial Analysis Perspectives upon Students' Skills in the Knowledge Economy

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Abstract. *The main purpose of this research is to identify which is the necessary level of students' competencies according to the requirements of the knowledge-based economy. In this approach, we will highlight the influence of generic skills that stimulate the students to think strategically and learn through their experiences. Throughout the sections of the paper, we will highlight the facts and characteristics of the knowledge economy and the profile of the young generations of students who are going to be the future players whether as managers or as employees. The quantitative part of the research was realized throughout the administration of a 30 items questionnaire which was addressed to both undergraduates and graduates, enrolled in management and business study programs from "Stefan cel Mare" University of Suceava, Romania. The database with the results was processed using a statistical software - SPSS, v.19. In order to reveal more insightful correlations about the respondents' opinions, we processed a Factorial Analysis for Principal Components. This analysis shows the most significant factors which influence the students' learning behavior and options during the educational process. We consider that the results of such a survey should be of interest for the university governance in order to increase the generated intellectual capital by improving the students' generic skills.*

Keywords: *generic skills; knowledge economy; learning to learn; problem solving; strategic thinking.*

Introduction

The necessity of this study stems from the fact that traditional teaching and learning has become insufficient for today's dynamic environment. In this sense, we will pinpoint the emerging opportunities in order to develop those competencies of knowledge-based economy students. More than ever universities are facing a great challenge regarding the requirements of their students who must adapt to the fast-changing environment (Bejinaru, 2017a, b; Dima, 2014; Duderstadt, 2000; Wells, 2017). Instead of the well-known Newtonian linear thinking model, it is necessary to develop strategic thinking as a key skill in achieving a competitive advantage in this turbulent world (Bratianu & Vasilache, 2010; Bratianu & Vătămănescu, 2017; Spender, 2014). The big issue is that universities must be able to prepare students

for jobs very different from the traditional ones and also for jobs that are yet unknown but shall pop-up into the labor market at any moment. Thus, the teaching process should change in order to meet these phenomena (Felin & Powell, 2016; Nonaka, 1991; Nonaka & Takeuchi, 1995; Teece, 2009). In the same time, complex student skills could be developed during extra-curricular activities integrated in knowledge management strategies (Zbuchea, Pînzaru, & Anghel, 2014).

At this point, we believe that the classic ways of teaching and learning which consist of the basic knowledge transfer are rather obsolete and not adapted. The improvement we suggest is to change the focus from simple learning of knowledge, by memorizing and reproducing information, to developing thinking skills which will enable graduates to think and act in a strategic manner – which will empower them for life. Certain thinking skills, which are developed as a student will grant the strategic thinking (Bratianu, 2015) in almost any field of interest, in any region of the globe, at any age or in whatever other conditions. Thinking and action should embrace new dynamics based on the whole spectrum of knowledge comprising rational, emotional, and spiritual knowledge fields and the organizational knowledge dynamics under the influence of the nonlinear integrators (Bratianu, 2013; Shattock, 2009; Stewart, 1999; Sveiby, 1997; Unger, 2015; Viedma & Cabrita, 2012; Watson, 2010; Wells, 2017).

In the knowledge-economy, generic skills are considered that category of competencies which ensures a high level of employability. Generic skills are also defined as core skills, key skills, essential skills, basic skills, soft skills, key competences, or employability skills and represent those capabilities which are the most adequate to stimulate personal and professional development based on learning (Bedwell, Fiore, & Salas, 2014; Goatman & Medway, 2011; Singh & Gera, 2015). A critical problem for the implementation of a fresh vision by prioritizing generic skills in universities is the double-ground perspective, involving both professors and students. At this point, the students' motivation and behavior accounts for the most in order for such strategy to succeed. Students must acknowledge the necessity of developing generic skills, as creative thinking or learning to learn in a dynamic business environment. In order to habilitate themselves to face the world challenges, they should become more diligent and assume a greater responsibility for achieving such generic skills by themselves not only through information presented at courses and lectures at the university (Chan, 2010; Rahman, Mokhtar, Yasin, & Hamzah, 2011).

Students' skills in the knowledge economy

The effects of globalization are the most powerful and fastest in the business world. In this respect, the managers of multinational companies have resorted to developing and implementing emerging strategies based on the main resource which is generically accepted as knowledge. In this new knowledge economy (Hadad, 2017) it becomes obvious that the solution is to focus on creating knowledge strategies and to integrate them into the corporate strategies (Bolisani & Bratianu, 2017; Bratianu & Bolisani, 2015; Kotter, 2012; Nonaka & Zhu, 2012; Spender, 2014).

Against this globally dynamic background, universities face a continuing challenge of adapting the teaching process of their students. Traditional teaching and learning methods based mostly on information transfer and accumulation do no longer respond effectively to new standards in the knowledge economy and knowledge society. This mismatch occurs because of the acceleration of life rhythm in all areas and thus the lifetime of a piece of information is shortened and a continuous updating is required. At this stage of evolution, the problem consists in transferring the concentration of efforts towards the development of generic skills of students and implement learning by doing (Dawe, 2002; Gibb, 2004).

The core competencies, basic competences or key competences that we refer to when speaking about the capabilities of a student/graduate of a profession are in fact *the generic skills* that contribute to the process of learning of the individual, facilitating personal and professional development. The development of these generic competencies is more difficult to achieve from the students 'perspective than from the teachers' perspective. The major obstacle is imposed by the students who do not want to make an intellectual effort to learn how to learn topical issues and thus updating themselves their knowledge about the changing environment, but prefer to receive the processed information, being necessary only memorizing it and further retrieving it when they are evaluated (Bratianu & Vătămănescu, 2017). Learning to learn becomes a new challenge for the academic environment so that students develop their ability to learn how to discover new knowledge themselves and not only rely on the systematized information presented to courses and seminars. Developing this category of *generic skills* involves the students' responsibility and the major advantage lies in the fact that they will be able to find solutions to the various problems they will face in the future and which are now unknown (Gibbons-Wood & Lange, 2000). That means also to develop a new university culture based on organizational learning (Bratianu, Agapie, Orzea, & Agoston, 2011; Ghinea & Bratianu, 2012).

On a medium to long term perspective, generic skills facilitate the employment of graduates and increase their learning capacity which is considered the main feature for developing personal mastery in the turbulent environment faced by learning organizations (Chan, 2010; Senge, 1999; Senge, Scharmer, Jaworski, & Flowers, 2004; Sin, Taveres, & Amaral, 2016; Singh, Thambusamy, & Ramly, 2014). Senge (1999, p.8) explains how and why generic skills are greatly contributing to identifying "connections between personal learning and organizational learning". In this sense, comparing the two perspectives, of business schools and business practice we can observe that little alignment is achieved. Though the business environment requires better generic skills and faster knowledge creation, the business schools are adapting their curricula too slowly to these new facts. "Only a few soft skills are explicitly addressed in the business schools' curricula, while other are omitted or ignored" (Massaro, Bardy, & Garlatti, 2016, pp.236-237). Day by day, the soft skills category is enlarging by new entries such as the ability to collaborate, work in groups, read social cues, and respond adaptively (Davies, Fidler, & Gorbis, 2011).

Considering these premises, the main objective of the present paper is to analyze students' perceptions regarding the teaching and learning models and the transition from the basic system of acquiring knowledge as a quantitative approach to a system of learning how to think, namely to develop generic abilities for business, such as: collecting data and information, problem solving, creative thinking, learning to learn and strategic thinking. A transformation at this level within universities is possible only throughout the strategic vision of academic leadership (Bratianu, 2013). As knowledge-intensive organizations, universities have the necessary resources and, in this sense, they must implement more knowledge strategies and practice for the inside framework.

Generic skills developed by universities in the knowledge economy

In this dynamic context, employers became very demanding and this phenomenon pushes greatly the mission of the university (Prelipcean & Bejinaru, 2016). According to the global barometer which is represented by the specialized community reunited every year at World Economic Forum in Davos the top ten skills for 2020 are significantly different from the previous ranking in 2015. Connecting the dots, we can assume that the most wanted skill in the labor market, which is '*complex problem solving*' can be obtained mainly throughout academic education and research. This target is to be achieved by universities throughout revolutionizing both their learning agenda and teaching system. The development of such generic skills like '*complex problem solving*' may result by integrating efforts of students and university professors alike (Bereiter, 2002; Faherty, 2015; Gvaramadze, 2011; Jackson, Sibson, & Riebe, 2014; Maritz, Jones, & Schwetzer, 2015; Mintzberg, 2004; Whitefield & Kloot, 2006).

"The knowledge-based economy has opened many market opportunities and universities have been prompt in approaching them. Specialized knowledge is often no longer simply shared free of charge, but turned into a profit opportunity" (Bejinaru, 2017a, p.252). Universities obtain multiple benefits when improving their system: first they increase the performance level of their undergraduates and graduates and thus on the long run they will remain an option for future candidates, second they raise the quality of their research and thus they attract funds, investors, and clients from the business sector, third they grow their prestige and thus climb-up in global rankings. Consequently, there is no doubt that universities are interested in bettering their system both for prestige and more financial earnings (Bejinaru, 2016).

Universities came to understand that their 'products' are top of the global list and at this very moment undergo a real struggle. This aims at leaving behind the obsolete structure of the traditional teaching school and launch on the market a dynamic organization. The education sector is gaining customers from several areas: business companies that want to buy innovations, licenses, know-how, and databases; public and private organizations which need to employ specialized workforce; people who want to study and obtain an academic degree.

Today universities act as a real entrepreneur does – meaning to adapt to the market fluctuations, to the clients' needs and to provide to the global trends and necessities. This context is very advantageous for universities as their main resource is knowledge, their processes focus on knowledge transfer and creation, their products (undergraduates and graduates, Ph.D. students and researchers) represent the human capital and reflect a certain level of knowledge and so at this point universities have all prerequisite to growing. However, under these promising conditions, the competition in the academic area becomes fiercer.

in 2020	in 2015
1. Complex Problem Solving	1. Complex Problem Solving
2. Critical Thinking	2. Coordinating with Others
3. Creativity	3. People Management
4. People Management	4. Critical Thinking
5. Coordinating with Others	5. Negotiation
6. Emotional Intelligence	6. Quality Control
7. Judgment and Decision Making	7. Service Orientation
8. Service Orientation	8. Judgment and Decision Making
9. Negotiation	9. Active Listening
10. Cognitive Flexibility	10. Creativity

Figure 1. Comparative Top Ten Generic Skills

Categories of generic skills

As we previously mentioned when speaking about the requirements of the knowledge economy, the number of generic skills is growing and changing at the same time. Even if they are subjected to global changes in all domains and thus there are great differences every five years, at least, their significance remains the same. The 'generic skills' represent a certain category that may be certainly applied by different individuals, in different contexts but in similar ways. This type of skills may be learnt from other individuals while they are using them in practice (Curtis, 2004). Generic skills are especially important for students' future career because they are considered the most useful in terms of increasing their chances of getting employed for the appropriate job, in the field of their education, motivation and personality traits (Hande, Mohammed, & Komatil, 2015; Vainikainen, Hautamaki, Hotulainen, & Kupiainen, 2015).

The European Union, throughout its offices, engages efforts throughout research studies for identifying which are the employability necessities of companies in terms of core skills in order to introduce their development into the curricula of universities and thus to provide competent students' for the labor market. Further, we shall present a brief argumentation of the top 10 skills for 2020, from Figure 1. This rank was established by World Economic Forum in Davos – 2016 (Curtin, 2004; Curtis, 2004; Rodzalan & Saat, 2012; Ulger, 2016).

Putting together the main literature and business trends we further argue the significance of 5 categories of skills to be achieved by students for increasing their employability changes in the future. In this sense, we want to emphasize also their role in the development of our research.

For any career field, *complex-problem solving* represents a key skill that employers search to discover in their job candidates. It represents a major selection criterion as many blue-collar positions, administrative and managerial positions require such abilities of complex-problem solving on a daily basis. It is considered a soft skill which combines the basic abilities acquired through education and learning with the ability of creative and efficient thinking for solving problems acquired throughout the practical experience. As this is the most wanted skill that employers need from their future employees they inquire about the following issues during interviews: the capacity to analyze and frame the causes of the given problem, the creativity to generate several solutions which will lead to achieve the final goal, the capacity to decide for the final solution, the ability of implementing a complete plan and also the capacity of assessing the effectiveness of the implemented solution (Curtis, 2004; Dawe, 2004).

Critical thinking skills – are available for anyone who practices. Critical thinking represents a superior level which needs exercise in order to be developed. It functions like exercising a sport or playing an instrument, the more you practice and the better you comply with the rules, the better you become. It is important to acknowledge that improvement of critical thinking is not possible without conscious commitment to learning. At the work-place, critical thinking is useful for evaluating particular issues in a certain context. It represents something different from gathering of facts and knowledge which can be learnt once and then used in the same form in many other occasions, like the nine times table which we memorize in early school. This type of skills is important for employers because a person that is good at critical thinking is easily achieving the followings tasks: identify and understand the connections between certain ideas; acknowledges the role and relevance of arguments; identifies, builds and evaluates arguments; sights mismatches and errors of reasoning; approaches issues in a systematic and consistent manner; reflects upon their own hypothesis, believes and values. The role of critical thinking is to judge issues in a specific way in order to achieve the best possible option in a context known by the decision-maker (Curtis, 2004; Dawe, 2004).

Creativity – is defined today as a synergetic result of thinking and producing. To be creative means not only to generate new ideas, in this case, you are imaginative but also to produce added value out of your creative thinking. Creativity skills are needed in order to obtain new solutions for new problems in a changing and turbulent business environment. As the context and the factors are changing, the same happens with issues and barriers that must be overcome. In order to be creative one must be committed to his/her work and also passionate. To be creative means to bring something new into being. Creativity must not be regarded as a burden but as a means of benefiting from all opportunities that the avalanche of new products, new technologies, and new processes is bringing (Curtis, 2004; Dawe, 2004).

Searching, collecting and organizing data, information and knowledge represents a category of skills which is related to digital literacy and are basic necessities for students as they enable the students to prepare for the tasks of their future jobs in terms of understanding the issues and contexts they deal with (Curtis, 2004; Dawe, 2004). The internet and the digital revolution could generate added value to educational processes (Pînzaru, Zbuchea, & Anghel, 2014).

Learning to learn represents a very important skill that ensures adaptability for the long term which allows students to renew their knowledge and information in accordance with the latest requirements of the continuously changing environments. The ability to learn to learn provides great benefits for the development of individuals, groups, and organizations. "This competence includes awareness of one's learning process and needs, identifying available opportunities, and the ability to overcome obstacles in order to learn successfully" according to the Recommendation of the European Parliament (2006, p.16). Regarding the long-term vision of education at European Union's level and at the global level, strategies are yet to be discussed taking into consideration prospects of 'future key skills' (Davies et. al, 2011).

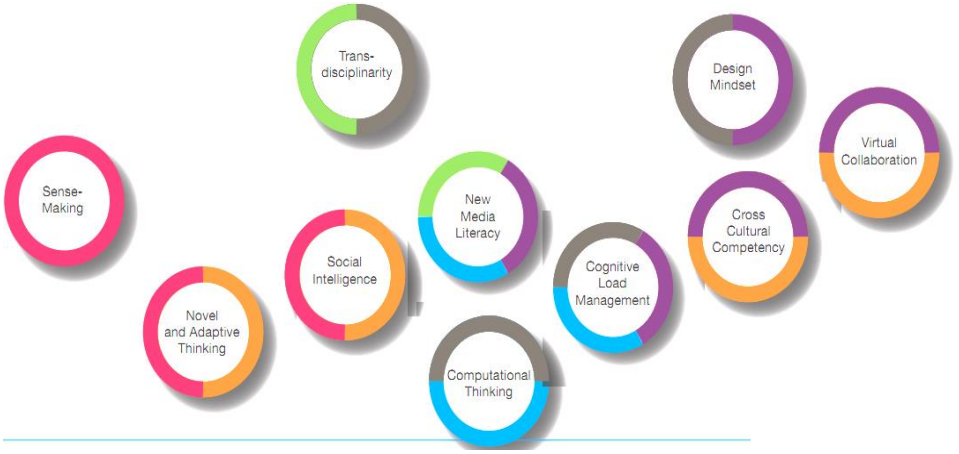

Figure 2. Key future skills (Davies et al., 2011)

Research methodology

This paper presents a research comprising a qualitative approach, throughout the literature review and a quantitative approach throughout the statistical analysis. For the investigated issue we developed the research throughout administrating a questionnaire of 30 items with response options on a Likert scale from level 1, the lowest to level 5, the highest. The items for the questionnaire were formulated in such a way as to reflect the students' interest and development potential in relation to the competences that will be required in the future and which we have presented in the previous sections. We were interested to picture their view regarding each of

the 5 competencies fields: collecting and organizing information, problem solving, creative thinking, learning to learn and strategic thinking. Overall, the research question is "What skills are they more interested in?". In this order, the hypotheses of the research which follow to be tested are:
H1: Students consider 'collecting data and information' a priority generic skill.
H2: Students consider 'problem solving' a priority generic skill.
H3: Students consider 'creative thinking' a priority generic skill.
H4: Students consider 'learning to learn' a priority generic skill.
H5: Students consider 'strategic thinking' a priority generic skill.

Our mission is that in the analyzed collectivity of undergraduates and graduates to obtain an integrative image of their perception regarding the importance and the role of developing generic skills and of their openness for such a teaching and learning approach. As a research tool, we used a 30-items questionnaire, which we distributed to undergraduates and graduates enrolled in the Faculty of Economics and Public Administration from "Stefan cel Mare" The University of Suceava, in Romania during the second semester period. In order to have more insights into their preferences, we have performed several steps of statistical analysis. Of course, the hierarchy of the factors shows their responsiveness to the investigated issue and thus the top values indicate their preferences but the lowest values reveal the skills they are not fond of.

The questionnaire was addressed to the students in the Faculty of Economics and Public Administration and we received feedback from 123 students, both undergraduates and graduates, enrolled in management and business study programs from USV. The questionnaire was built and transmitted to be answered throughout the Google platform – Event Feedback. All valid questionnaires were processed using SPSS, version 19. Additionally, a factorial analysis was performed, with a view to extracting the most important factors which are involved in developing students' skills in university programs (Arkkelin, 2014). Identifying and understanding the compositions and sources of these factors enables us to propose some options of improving the existing level of knowledge competencies and thus improve the curricula and furthermore the potential of the students as human capital within the knowledge economy.

Statistical tests and factorial analysis

In order to comply with the statistical methodology, we first assessed the accuracy of the method and employed the Bartlett and Kaiser-Meyer-Olkin (KMO) tests (Table 1). According to the values obtained from these tests, we have the validation for applying the factor analysis method onto the collected data. The value of KMO is .840 -which indicates a very good adequacy of the selected method. A value below 0,7 of the KMO test would have questioned the adequacy of the method. Both the Bartlett test and the KMO test show an excellent accuracy for using the factor analysis for the present research.

Table 1. KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.840
Bartlett's Test of Sphericity	Approx. Chi-Square	1793.155
	df	435
	Sig.	.000

For the factorial analysis, we selected the option of principal components analysis as a first step. The rotation option of principal components analysis is more advantageous because it maximizes the variance of the factors components and leads to smaller loadings of variables for each factor. The fundamental principle of this method is to extract the smallest number components that represent as much as possible from the total information contained in the original data, these new components expressing new attributes of individuals and built so that they are uncorrelated, each of these new variables being a linear combination of original variables. We have to specify that using the principal components analysis eliminates data redundancy (Arkkelin, 2014). The final output makes the interpretation of the factors more pertinent. Following this protocol, we obtained in the first rotation 8 factors explaining 66.572 % of the responses enclosed in the original database (Table 2).

For this type of analysis, a factor represents a latent variable which should be named and referenced according to the information embedded. The load structure of a factor may provide suggestions in this regard. Loading values greater than 0.6 are considered important, those below 0.4 are considered low. Higher load variables are the combination of the initial variables that determine the factor, so are the most relevant in deciding the name of the factor. Considering this general condition, we were allowed to further process the second rotation with an established number of factors in order to converge to the initial hypothesis of our research.

In this case, we can observe the loadings of factors' components in Table 3 and apply the presented rules we shall propose the factors titles considering primarily the components with the highest loadings. We shall further present in Table 4 the structure and names of the 5 factors.

Table 2. Total variance explained

	Initial Eigenvalues		
Factor	**Total**	**% of Variance**	**Cumulative %**
1	10.082	33.606	33.606
2	1.938	6.459	40.064
3	1.624	5.413	45.477
4	1.481	4.938	50.415
5	1.377	4.588	55.004
6	1.205	4.015	59.019
7	1.185	3.950	62.970
8	1.081	3.603	66.572
9	.919	3.063	69.635
10	.876	2.921	72.556
11	.777	2.589	75.146
12	.744	2.479	77.625
13	.700	2.333	79.958
14	.644	2.148	82.106
15	.622	2.073	84.179
16	.566	1.887	86.066
17	.497	1.656	87.722
18	.463	1.544	89.266
19	.414	1.381	90.646
20	.382	1.274	91.921
21	.370	1.234	93.154
22	.359	1.196	94.351
23	.298	.993	95.344
24	.288	.961	96.304
25	.250	.833	97.137
26	.227	.756	97.893
27	.208	.695	98.588
28	.159	.531	99.119
29	.150	.501	99.620
30	.114	.380	100.000

Table 3. Rotated Factor Matrix[a]

	Factor				
	1	**2**	**3**	**4**	**5**
Q 10	.660				
Q 18	.582				
Q 05	.577				
Q 30	.547				
Q 27	.544				
Q 28	.498				
Q 11	.496				
Q 24	.487				
Q 25	.483				
Q 19	.404				
Q 12	.403				
Q 23	.393				
Q 14	.375				
Q 13		.760			
Q 15		.712			
Q 29		.545			
Q 20		.480			
Q 17		.439			
Q 03		.336			
Q 06			.852		
Q 16			.668		
Q 04			.502		
Q 02			.427		
Q 21			.420		
Q 09				.713	
Q 22				.496	
Q 07				.468	
Q 08				.386	
Q 01					.506
Q 26					.401
Extraction Method: Principal Axis Factoring. Rotation Method: Varimax with Kaiser Normalization.					
a. Rotation converged in 7 iterations.					

Concluding upon the factor analysis results and conditions we further present the descriptive statistics and consistency tests for the 5 factors. Once more we state that we decided on the factors components according to their loading values, meaning in a descending order. The first four variables enclosed in Factor 1 have the highest loading values and thus are the most representative for the investigated category of students' skills. We applied this rule for all the factors and so for factor 1 we have the following 4 items: Q 10=.660; Q 18=.582; Q 05=.577; and Q 30= .547. For factor 2, we include: Q 13= .760; Q 15= .712; Q 29= .545; Q 20= .480. Items comprised in factor 3 are: Q 06= .852; Q 16= .668; Q 04= .502; Q 02= .427. In the formation of factor 4 we

have items: Q 09= .713; Q 22= .496; Q 07= .468; Q 08= .386. For factor 5 the matrix retrieved only two items: Q 01= .506; and Q 26= .401. The structures of these factors must be tested in order to validate the consistency.

Table 4. Reliability statistics of factors

	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
Factor 1	.740	.745	4
Factor 2	.758	.770	4
Factor 3	.803	.803	4
Factor 4	.706	.708	4
Factor 5	.468	.468	2

Starting with Factor 1 we performed the internal consistency test, in order to test the reliability of all variables comprised in each factor. As a general rule, values higher than 0.7 prove a very good internal reliability or consistency. The Cronbach alpha coefficient test performed for Factor 1 retrieved a value of .740 which confirms that these 4 variables have the most influence on students' perspective regarding the competencies of strategic thinking.

Looking at the Mean values (Table 4, below) of the descriptive statistics for variables present in factor 1 – strategic thinking, we obtain an average mean with the highest value M=4.59 which confirms that the respondents recognize the importance of this category of skills and are interested in developing their strategic thinking during their higher education cycles I and II. This high value of the Mean could also suggest the fact that students acknowledge the role of strategic thinking for their future professional activity and this thinking pattern influenced them in responding to the questionnaire. In this sense, it is obvious that they have expectancies from their professors in order to help them develop their strategic thinking skills according to the educational curricula.

Table 5. Descriptive statistics for Factor 1: Strategic thinking

Item	Variables	Value	Mean	Std deviation
Q 10.	Vision is important for business development.	.660	4.6341	.68075
Q 18.	Long-term thinking is essential in business.	.582	4.6016	.70988
Q 05.	We see future as a sequence of probable events.	.577	4.6829	.59115
Q 30.	The strategy is the path for achieving a long-term goal.	.547	4.4634	.78189

The four variables enclosed in Factor 2 have the highest loading values and thus are the most representative for the investigated category of students' skills. The Cronbach alpha coefficient test performed for Factor 2 retrieved a value of .758 (Table 5, above) which confirms that these 4 variables have the most influence upon students' perspective regarding the skills of learning to learn.

The value of the Mean for factor 2 is M=3.69 which is the lowest from all Mean values of the 5 factors. According to the average mean value, we can understand that these issues regarding the skills of learning to learn have been rated lower on the Likert scale by a majority of respondents but obviously not with the lowest (1). This might be interpreted as a hesitant behavior – due to the fact that graduates and undergraduates perceive the skills of 'learning to learn' as a higher level which implies more hard work, more responsibility and more diligence on their part. As we can observe in the composition of factor 2 (in Table 6) respondents agree more to the idea that '*Q15. Learning must continue after graduation'* due to the fact that they still feel vulnerable and consider that they should learn more in the future. The other three items which address the superiority of the learning process and the mental and spiritual effort necessary for the learning process were rated lower.

Table 6. Descriptive statistics for Factor 2: Learning to learn

Item	Variables	Value	Mean	Std deviation
Q 13.	Learning is a more complex than memorizing.	.760	3.2927	1.45834
Q 15.	Learning must continue after graduation.	.712	4.0569	.95214
Q 29.	In faculty we must learn how to learn.	.545	3.6911	1.22895
Q 20.	Learning must have a good motivation.	.480	3.7317	1.33719

The four variables enclosed in Factor 3 have the highest loading values and thus are the most representative for the investigated category of students' skills. The Cronbach alpha coefficient test performed for Factor 3 retrieved a value of .803 which confirms even a better consistency of these 4 variables which have the most influence upon students' perspective regarding the skills of creative thinking. Factor 3, designated as 'Creative thinking' has registered the second lowest Mean value M=3.97 from all factors. These statistical measures show that students have a problem with this category of skills whether they don't enjoy being creative, whether they don't know how to do it or maybe they consider the creative thinking approach too risky. The skills of 'creative thinking' are very important to be developed and encouraged during academic education because they will later generate competitive advantage for the organizations in the business environment.

Table 7. Descriptive statistics for Factor 3: Creative thinking

Item	Variables	Value	Mean	Std deviation
Q 06.	I like to have different ideas than others.	.852	3.5772	1.33065
Q 16.	New problems need new solutions.	.668	3.7073	1.26576
Q 04.	Any student can develop a creative thinking.	.502	4.3496	.92314
Q 02.	Creativity can rise both from failure and success.	.427	4.2602	.92184

The four variables enclosed in Factor 4 have the highest loading values and thus are the most representative for the investigated category of students' skills. The Cronbach alpha coefficient test performed for Factor 4 retrieved a value of .706 which confirms an average level of consistency of these 4 variables which have the most influence upon students' perspective regarding the skills of problem solving. When focusing on factor 4 – 'problem solving', the items which reflect this dimension have the highest mean value M=4.33. This reveals another thinking pattern of the respondents which tends towards pragmatism – and real problem solving.

Table 8. Descriptive statistics for Factor 4: Problem solving

Item	Variables	Value	Mean	Std deviation
Q 09.	Solving problems is learnt through practice.	.713	4.3577	.97619
Q 22.	A problem may have many solutions.	.496	4.4065	.90388
Q 07.	Learning methods of solving problems is more important than memorizing a big volume of information.	.468	4.1707	.97264
Q 08.	A problem reflects s difference between what we want and what we have.	.386	4.4065	.78758

The four variables enclosed in Factor 5 have good loading values and thus are representative for the investigated category of students' skills. The Cronbach alpha coefficient test performed for Factor 5 retrieved a value of .468 which is a quite low level of consistency of these 2 variables which represents the skills of 'collecting and organizing information'. At this point, we consider that the respondents had some difficulties in understanding the real meaning of the questions referring to the processes of collecting and organizing their data and information. At their education level, undergraduates and graduates tend to relate common questions to much more complex contexts. The composition of this factor shows that respondents had very heterogeneous options regarding the importance of the issues related to 'collecting and organizing information'. With respect to factor 5, the analysis of the descriptive statistics shows that the items referring to the process of collecting and organizing information, (i.e., Q01 and Q26) have an average mean of (M=4.28) which is the second highest value and indicates that the respondents rely on academic professors to provide relevant information at their courses and teaching activities. Regarding the activities of collecting and organizing information the questioned students were not so enthusiastic to do this kind of work by themselves and as previously mentioned prefer the support of a coordinator.

Table 9. Descriptive statistics for Factor 5: Collecting and organizing information

Item	Variables	Value	Mean	Std deviation
Q 01.	I prefer to summarize myself the courses for studying.	.506	4.2927	.96438
Q 26.	In business is better to gather yourself the data about the market.	.401	4.2683	.98408

Discussion of statistical research results

To conclude with, we will synthesize the main goal of the research, the methods used and the results obtained in order to validate the research hypothesis. The purpose of the research has been achieved as we presented and argued the students' preferences regarding the investigated categories of skills. We consider that the hierarchy of the factors obtained as a result of the statistical processing and analysis represents the validation of the previously stated hypothesis:
- *H1: Students consider 'collecting data and information' a priority generic skill*, was validated by the formation of *factor 5* (M=4.28);
- *H2: Students consider 'problem solving' a priority generic skill,* was validated by the formation of *factor 4* (M=4.33);
- *H3: Students consider 'creative thinking' a priority generic skill*, was validated by the formation of *factor 3* (M=3.97);
- *H4: Students consider 'learning to learn' a priority generic skill*, was validated by the formation of *factor 2* (M=3.69);
- *H5: Students consider 'strategic thinking' a priority generic skill*, was validated by the formation of *factor 1* (M=4.59).

The interesting fact, but rewarding, is that we initiated the research with equivalent hypotheses statements for the five areas of generic skills and at the end we obtained a validation ranking throughout the statistical analysis of students' responses. Of course, the hierarchy of the factors shows the students responsiveness to the investigated issue and thus the top values indicate their preferences and the lowest values reveal the skills they appreciate the least.

The results of the factorial analysis show the factors that most influence the students' perspective on the learning process provided by professors in their university. Analyzing the components of the factors and the values recorded by each item - we can notice that the students' preferred orientation regarding the teaching and learning processes is based on achieving business competencies because of the further arguments:
- students are motivated to become excellent professionals and managers;
- students are driven by achieving success and thus they acknowledge the role of education for their future ability to solve complex problems;
- students comply with but are not satisfied with the teaching style that implies the transmission of the learning objectives, the specification of competencies needed to be acquired at the end of the course and an evaluation requiring the application of acquired competencies and not only the retrieval of information from their memory;
- students are encounter difficulties to engage in creative thinking activities and learning due to a certain level of insecurity that they perceive towards this experience;
- students show a low acceptance of learning to learn skills as they associate this type of competencies to a higher level of intelligence, of expertise and considerably much more diligence on their behalf;
- students prefer the least classroom teaching and learning system through which information is delivered to them and the expected response from them should only reflect their storage and retrieval capacity.

Limits of the presented research may be considered the sample of students belonging to a single Romanian public university meaning that reflects a contextual perspective. However, the survey may be extended to the national level and international area also but after a calibration of the investigation instrument. The originality of the paper consists in the fact that provides insights into the perceptions of students when considering the options of learning generic skills as their acceptance of engaging with responsibility towards a new type of learning process.

Conclusions and perspectives

In conclusion, students are aware of what is important for them, they rate highly on strategic thinking and problem solving issues and afterwards, an average rating, on collecting and organizing information. These are the main skills which guarantee that they will become good businessmen, successful entrepreneurs or performant managers (Chan, 2010; Rahman et al., 2011; Senge et al., 2004; Sin et al., 2016). The half-down rated skills are creative thinking and learning to learn because are asking for more cognitive effort, given the time allocated to study, risks and uncertainty implied.

The usefulness of this research is that may be a starting point for changing the students' perspectives regarding the learning process in order to facilitate their skills acquiring and improvement. Also, it may be useful for Faculty leadership in order to adapt the teaching curricula and teaching methods in order to redirect the efforts of both teachers and students towards this type of skills which are greatly emphasized as critical for the new generation of employees and employers (Faherty, 2015; Jackson et al., 2014; Maritz et al., 2015). The current study provides a preliminary insight into the perception of students from a Romanian university about developing generic skills and into their readiness to assume the role of main actors in the learning process. We consider this information valuable as it represents a starting point for the elaboration of any curricula improvement or education strategy (Bedwell et al., 2014; Chan, 2010; Faherty, 2015; Hande et al., 2015; Massaro et al., 2016). Investigating the students' perceptions and their opinions we can better understand their needs and in this way, we can provide more satisfaction by offering more appropriate education services.

Acknowledgements*: The present paper has been financially supported by the Academy of Romanian Scientists, Program No. 15/2018 "Strategies for Implementing Knowledge Economy in Romania".*

References

Arkkelin, D. (2014). Using SPSS to Understand Research and Data Analysis. Retrieved from https://scholar.valpo.edu/cgi/viewcontent.cgi?referer=https://www.google.ro/&httpsredir=1&article=1000&context=psych_oer.

Bedwell, W.L., Fiore, S.M., and Salas, E. (2014). Developing the future workforce: An approach for integrating interpersonal skills into the MBA classroom. *Academy of Management Learning & Education*, 13(2), 171-186.

Bejinaru, R. (2016). Knowledge dynamics impact on intellectual capital in organizations. *Management Dynamics in the Knowledge Economy,* 4(4), 515-534.

Bejinaru, R. (2017a). Universities in the knowledge economy. *Management Dynamics in the Knowledge Economy*, 5(2), 251-271.

Bejinaru, R. (2017b) Dynamic capabilities of universities in the knowledge economy. *Management Dynamics in the Knowledge Economy*, 5(4), 577-595.

Bolisani, E., and Bratianu, C. (2017). Knowledge strategy planning: an integrated approach to manage uncertainty, turbulence, and dynamics. *Journal of Knowledge Management*, 21(2), 233-253.

Bratianu, C. (2013). Nonlinear integrators of the organizational intellectual capital. In Fathi, M. (Ed.). *Integration of practice-oriented knowledge technology: trends and perspectives* (pp.3-17). Heidelberg: Springer.

Bratianu, C. (2015). Developing strategic thinking in business education. *Management Dynamics in the Knowledge Economy*, 3(3), 409-429.

Bratianu, C., Agapie, A., Orzea, I., and Agoston, S. (2011). Inter-generational learning dynamics in universities. *Electronic Journal of Knowledge Management*, 9(1), 10-18.

Bratianu, C., and Bolisani, E. (2015). Knowledge strategy: an integrated approach for managing uncertainty. In Garlatti, A., and Massaro, M. (Eds.), *Proceedings of the 16th European Conference on Knowledge Management* (pp.169-177). Reading: Academic Conferences and Publishing International.

Bratianu, C., and Vasilache, S. (2010). A factorial analysis of the managerial linear thinking model. *International Journal of Innovation and Learning*, 8(4), 393-407.

Bratianu, C., and Vătămănescu, E.M. (2017). Students' perception on developing generic skills for business: a knowledge based approach. *VINE Journal of Information and Knowledge Management Systems*, 47(4), 490-505.

Chan, W.S.C. (2010). Students' understanding of generic skills development in a university in Hong Kong. *Procedia-Social and Behavioral Science*, 2, 4815-4819.

Curtin, P. (2004). Employability skills for the future. In Gibb, J. (Ed.), *Generic skills in vocational education and training* (pp.38-68). Adelaide: National Centre for Vocational Education Research.

Curtis, D.D. (2004). The assessment of generic skills. In Gibb, J. (Ed.), *Generic skills in vocational education and training* (pp.136-156). Adelaide: National Centre for Vocational Education Research.

Davies, A., Fidler, D., and Gorbis, M. (2011). *Future work skills 2020*. Palo Alto: Institute for the Future for the University of Phoenix Research Institute.

Dawe, S. (2002). *Focusing on generic skills in training packages*. Leabrook: National Center for Vocational Education Research.

Dima, A.M. (2014). *Trends in European higher education convergence*. Hershey: IGI Global.

Duderstadt, J.J. (2000). *A university for the 21st century*. Ann Arbor: The University of Michigan Press.

European Parliament (2006). Recommendation of the European Parliament and of the Council on key competences for lifelong learning. *Official Journal of the European Union*. Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32006H0962&from=EN.

Faherty, A. (2015). Developing enterprise skills through peer-assessed pitch presentations. *Education + Training*, 57(3), 290-305.

Felin, F., and Powell, T.C. (2016). Designing organizations for dynamic capabilities – Introduction. *California Management Review*, 58(4), 78-96.

Ghinea, V.M., and Bratianu, C. (2012). Organizational culture modeling. *Management & Marketing,* 7(2), 257-276.

Gibb, J. (2004). *Generic skills in vocational education and training. Research readings.* Adelaide: National Center for Vocational Education Research.

Gibbons-Wood, D., and Lange, T. (2000). Developing core skills – lessons learned from Germany and Sweden. *Education + Training*, 42(1), 24-32.

Goatman, A., and Medway, D. (2011). A future for undergraduate education in UK business schools? *Journal of Marketing for Higher Education*, 21(1), 107-114.

Hadad, S. (2017). Knowledge economy: characteristics and dimensions. *Management Dynamics in the Knowledge Economy*, 5(2), 203-225.

Hande, S., Mohammed, C.A., and Komatil, R. (2015). Acquisition of knowledge, generic skills and attitudes through problem-based learning: Student perspectives in a hybrid curriculum. *Journal of Taibah University Medical Sciences*, 10(1), 21-25.

Jackson, D., Sibson, R., and Riebe, L. (2014). Undergraduate perceptions of the development of team-working skills. *Education+ Training*, 56(1), 7-20.

Kotter, J. (2012). Accelerate. *Harvard Business Review*, 90(11), 45-58.

Maritz, A., Jones, C., and Schwetzer, C. (2015). The status of entrepreneurship education in Australian Universities. *Education + Training,* 57(8/9), 1020-1035.

Massaro, M., Bardy, R., and Garlatti, A. (2016). A soft skills training model for executive education. In Lepeley, M.-T., von Kimakowitz, E., and Bardy, R. (Eds.), *Human Centered Management in Executive Education* (pp.222-241). London: Palgrave Macmillan.

Mintzberg, H. (2004). *Managers not MBAs: a hard look at the soft practice of managing and management development*. London: Financial Times/Prentice Hall.

Nonaka, I. (1991). The knowledge-creating company. *Harvard Business Review*, 69(6), 96-104.

Nonaka, I., and Takeuchi, H. (1995). *The knowledge-creating company. How Japanese companies create the dynamics of innovation*. Oxford: Oxford University Press.

Nonaka, I., and Zhu, Z. (2012). *Pragmatic strategy. Eastern wisdom, global success*. Cambridge: Cambridge University Press.

Pînzaru, F., Zbuchea, A., and Anghel, L. (2014). Knowledge Development Through the Internet. In *ICICKM2014-Proceedings of the 11th International Conference on Intellectual Capital, Knowledge Management and Organisational Learning: ICICKM2014* (p.314). Academic Conferences Limited.

Prelipcean, G., and Bejinaru, R. (2016). Universities as learning organizations in the knowledge economy. *Management Dynamics in the Knowledge Economy*, 4(4), 469-492.

Rahman, S., Mokhtar, S.B., Yasin, R.M., and Hamzah, M.I.M. (2011). Generic skills among technical students in Malaysia. *Procedia-Social and Behavioral Sciences*, 15, 3713-3717.

Rodzalan, S.A., and Saat, M.M. (2012). The effects of industrial training on student's generic skills Development. *Procedia-Social and Behavioral Sciences*, 56, 357-368.

Senge, P. (1999). *The fifth discipline. The art & practice of the learning organi*zation. London: Random House.

Senge, P., Scharmer, C.O., Jaworski, J., and Flowers, B.S. (2004). *Presence. Exploring profound change in people, organization, and society*. New York: The Society of Organizational Learning.

Shattock, M. (2009). *Entrepreneurialism in universities and the knowledge economy. Diversification and organisational change in European Higher Education*. New York: Society for Research in Higher Education and Open University Press.

Sin, C., Taveres, O., and Amaral, A. (2016). Who is responsible for employability? Student perceptions and Practices. *Tertiary Education and Management*, 22(1), 1-18.

Singh, H., and Gera, M. (2015). Generic skills for sustainable development. *Indian Journal of Research*, 4(6), 290-291.

Singh, P., Thambusamy, R.X., and Ramly, M.A. (2014). Fit or unfit? Perspectives of employers and university instructors of graduates' generic skills. *Procedia-Social and Behavioral Sciences*, 123, 315-324.

Spender, J.C. (2014). *Business strategy. Managing uncertainty, opportunity, & enterprise*. Oxford: Oxford University Press.

Stewart, T. (1999). *Intellectual capital: the new wealth of organizations*. London: Nicholas Brealey Publishing.

Sveiby, K.E. (1997). *The new organizational wealth: managing and measuring knowledge-based assets*. New York: Berret Koehler.

Teece, D.J. (2009). *Dynamic capabilities and strategic management: organizing for innovation and growth*. Oxford: Oxford University Press.

Ulger, K. (2016). The creative training in the visual arts education. *Thinking Skills and Creativity,* 19, 73-87.

Unger, R.M. (2015). The task of the social innovation movement. In Nicholls, A., Simon, J., and Gabriel, M. (Eds.), *New frontiers in social innovation research* (pp.233-251). London: Palgrave Macmillan.

Vainikainen, M.P., Hautamaki, J., Hotulainen, R., and Kupiainen, S. (2015). General and specific thinking skills and schooling: Preparing the mind to new learning. *Thinking Skills and Creativity*, 18, 53-64.

Viedma, J.M., and Cabrita, M.R. (2012). *Entrepreneurial excellence in the knowledge economy. Intellectual capital benchmarking systems*. London: Palgrave Macmillan.

Watson, D. (2010). Universities' engagement with society. In McGraw, B., Peterson, P., and Baker, E. (Eds.), *The International Encyclopedia of Education* (pp.398-403). London: Elsevier.

Wells, P.J. (2017). The role of higher education institutions today. In Grau, F.X. (Ed.), *Higher education in the world 6. Toward a socially responsible university: balancing the global with the local* (pp.31-32). Girona: Global University Network for Innovation.

Whitefield, D., and Kloot, L. (2006). Personal and interpersonal skills. *Asian Review of Accounting*, 14 (1/2), 101-121.

Zbuchea, A., Pînzaru, F., and Anghel, L. (2014). Knowledge Management across the organization. In O. Nicolescu, et al. (Eds.), *SAMRO 2014 Challenges, Performances and Tendencies in the Organization Management International Conference, 22 – 24 June 2014*. Retrieved from https://www.researchgate.net/profile/Alexandra_Zbuchea/publication/263441521_Knowledge_management_across_the_organization_A_case_study_of_higher_education/links/00b4953ad4ed96b801000000.pdf.

Received: April 26, 2018
Accepted: June 15, 2018