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Emotional Knowledge: the Hidden Part of the Knowledge Iceberg

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Abstract. *According to Daniel Kahneman (2011), our thinking process is based on two systems: system 1 operates automatically and quickly, with little awareness of voluntary control, system2 operates slowly and constructs thoughts in a logic order. System 1 processes actually emotional knowledge using our unconscious cognitive capability. Cognitive scientists discovered that we are primarily emotional decision makers, which means that managers and leaders need to rely on their emotional knowledge. The purpose of this paper is to present a qualitative and quantitative research concerning the paradox of emotional knowledge. That means that on one hand most of us ignore emotional knowledge by identifying knowledge with cognitive knowledge, and on the other hand by using emotional knowledge in decision making. The qualitative research has been done by reflecting on knowledge management, strategic management and change management literature concerning emotional knowledge and emotional intelligence, while the quantitative research has been done by conceiving a questionnaire and using it in an academic environment. A total of 1200 questionnaires were distributed to the students of Bucharest University of Economic Studies, and we got a response rate of 37%. Each questionnaire contains 40 questions concerning the awareness, education, transfer, and management of emotional knowledge. The data has been processed with the help of the specialized software SPSS version 19, and AMOS version 18. Statistical analysis includes both exploratory and confirmatory factorial analysis. The results of the statistical analysis reveal the main influence factors affecting our understanding of emotional knowledge, the way we learn through education about emotional knowledge, the way this knowledge is transferred, and the importance of using it by managers and leaders.*

Keywords: *emotional knowledge, emotional intelligence, explicit knowledge, cognitive knowledge, tacit knowledge.*

Introduction

It is well known the metaphor of the knowledge iceberg: knowledge may be conceived as an iceberg whose visible part represents explicit knowledge, and the hidden part representing tacit knowledge. The hidden part is much larger than the visible part of the iceberg, fact that reflects the ratio between the tacit knowledge and explicit knowledge. As Polanyi used to say, we may know much more than we can tell. "*I shall reconsider human knowledge by starting from the fact that we can know more than we can tell. This fact seems obvious enough; but it is not easy to say exactly what it means. Take an example. We know a person's face, and can recognize it among a thousand, indeed among a million. Yet we usually cannot tell how we recognize a face we know. So most of this knowledge cannot be put into words*" (Polanyi, 1983, p.4). However, tacit knowledge is a fuzzy concept containing a mixture of experience, subjective insights, intuitions, hunches, ideals, values, and emotions. In order to make a step forward in understanding knowledge nature we may change the old dyad of explicit knowledge-tacit knowledge (Nonaka, 1994; Nonaka & Takeuchi, 1995) into a new dyad composed of cognitive knowledge-emotional knowledge (Brătianu & Andriessen, 2008; Brătianu, 2011).

The Cartesian dualism of body and mind, expressed so clearly by the famous dictum *Cogito, ergo sum!*, promoted two ideas about human nature (Kahneman, 2011): (a) people are rational, and (b) emotions measure the departure from rationality. The explanation comes mostly from the Newtonian perspective use by the Western science and culture. By contrast, the Eastern perspective (Kaufman, 1994; Nonaka & Takeuchi, 1995; Nonaka & Zhu, 2012; Ohmae, 1982) emphasizes the oneness of mind and body. Research performed in cognitive science demonstrates that the gap between thoughts and emotions is narrowing, and that they represent two fundamental components of our inner representation of the world we are living in (Damasio, 1994; Damasio, 1999; Fauconnier & Turner, 2002; Frith, 2007; Immordino-Yang & Damasio, 2007; Kahneman, 2011; LeDoux, 1999). Moreover, as underlined by Hill (2008), in the process of making decisions as consumers, emotions are central and not peripheral. In change management, emotions are dominant in influencing people (Kotter, 1996; Kotter & Cohen, 2002; Kotter, 2008). As a result of all this research, *emotional knowledge* is emerging as a new and powerful concept with many implications in decision making and knowledge management.

The purpose of this paper is to present a qualitative and quantitative research concerning the paradox of emotional knowledge. That means that on one hand most of us ignore emotional knowledge by identifying knowledge with cognitive knowledge, and on the other hand by using emotional knowledge together with cognitive knowledge in decision making. The qualitative research has been done by reflecting on knowledge management, strategic management and change management concerning emotional knowledge and emotional intelligence, while the quantitative research has been done by conceiving a questionnaire and using it in an academic environment. This research has been stimulated by the following questions: (a) How much are students aware of the importance played by emotional knowledge in decision making and business? (b) What are the specific ways of transferring emotional knowledge? (c) How much education helped them to understand emotions and emotional knowledge? and (d) How important is to use efficiently emotional knowledge?

Emotional knowledge

Nonaka and Takeuchi consider tacit knowledge the hidden part of the iceberg, and that emotional knowledge is an important part of it. Subjective insights and intuitions belong to this category of emotional knowledge (Nonaka & Takeuchi, 1995). Emotional knowledge is created by emotions, and integrated together with cognitive knowledge into our mental representation of the world. Emotions can be simply described as being specific reactions to events, agents and their actions, and objects (O'Rorke & Ortony, 1994). Moreover, emotion is fundamental in decision making, being like a spectrum of know-how that allows people to have adequate reactions to different external forces. Emotions contain emotional knowledge generated by emotional triggers (Immordino-Yang & Damasio, 2007).

Although emotion and cognition have been treated most of the time as two separate fields of research and two separate entities, they "*are inextricably intertwined. Feelings influence thoughts and actions, which in turn can give rise to new emotional reactions*" (O'Rorke & Ortony, 1994, p.283). Immordino-Yang and Damasio (2007) use the concept of *emotional thought* to describe the overlapping between the emotion and cognition domains. This is extremely important for understanding the real functioning of memory, decision making, and creativity. Thus, reflecting especially on the knowledge management literature we found three main approaches: (1) knowledge is basically cogni-

tive knowledge, and it is generated in the rationality domain; (2) thoughts and ideas are different entities and there is no interaction between them; (c) thoughts and ideas reflect same complex reality and they interact in the decision making.

Based on the metaphor of thermodynamics, especially on the transformation between mechanical energy and thermal energy, Bratianu makes a step forward and advances the idea of a continuous dynamics between the cognitive knowledge and emotional knowledge (Brătianu, 2011). That means that cognitive knowledge can be transformed into emotional knowledge, and emotional knowledge can be transformed into cognitive knowledge, respectively. This dynamics represents actually the engine of the decision making, powered by the two systems of thinking, as shown by Kahneman (2011, p.21): "*System 1 operates automatically and quickly, with little or no effort and no sense of voluntary control. System 2 allocates attention to the effortful mental activities that demand it, including complex computations. The operations of System 2 are often associated with the subjective experience of agency, choice, and concentration*". Knowledge dynamics is important also for the way we are aware of our emotions and we manage them in our personal and professional life (Fenton-O'Creevy et al., 2011; Koole, 2009; Lagattuta & Wellman, 2001; Lindquist & Barrett, 2008; Miller et al., 2005; Reus & Liu, 2004). Understanding and using efficiently emotional knowledge is an important capability of managers and leaders (Bass & Riggio, 2006; Daft, 2008; Ekman, 2003; Hess & Bacigalupo, 2010; Jordan et al., 2013; Madden et al., 2012; Miller et al., 2012; Nag & Gioia, 2012). Although Kotter (2012) is discussing the dual management system, his argument for using emotions in decision making may be considered as a generic one. Emotional knowledge is also essential in complex organizational processes like strategies implementation through change management (Kotter, 1996; Mohrman & Lawler, 2012; Rafferty et al., 2013). Our qualitative research leads to a challenging result: the existence of knowledge dynamics, as a continuous transformation process of cognitive knowledge into emotional knowledge, and vice versa.

A critical analysis of the emergency of the emotional knowledge as a major player in decision making, with direct implications in management, marketing, leadership and entrepreneurship rises the question of its awareness, and its development through education. Our research is trying to evaluate the degree of such an awareness at students in economics and business, and how much they consider that education in schools and university helped them to master their emotions and emotional intelligence.

Research methodology

The instrument used in our research was the questionnaire. The design and elaboration of this questionnaire to collect the quantitative data went through four phases: (1) literature analysis; (2) elaboration of the first draft of the questionnaire; (3) testing the questionnaire, and (4) improving its content, and elaboration of the final version. Literature analysis helped us to understand different perspectives in interpreting emotional knowledge, and the way we learn and use this kind of knowledge. The main ideas of this research we have presented in the first part of this paper. In the second phase we design the basic structure of the questionnaire, considering four main pillars: awareness of emotional knowledge, the specific way of transferring emotional knowledge, education for emotional knowledge and using emotional knowledge. We designed the first draft of the questionnaire with 40 questions able to capture the respondents views concerning emotional knowledge as the hidden part of the knowledge iceberg. This first draft of the questionnaire was tested within a group of experts in knowledge management. The testing phase had as the main purpose the evaluation of the accuracy of the questions used and possible suggestions for improving the questionnaire. Based on the received suggestions we elaborated the final version of the questionnaire. The first part of the questionnaire contains items to describe the general profile of the respondents (age, gender, and level of education). The second part contains 40 assertions aiming at measuring respondent's agreement level with each of them using a Likert scale with five divisions: 1 (strongly disagree), 2 (disagree), 3 (neither agree nor disagree), 4 (agree), and 5 (strongly agree). For our research we considered the academic environment, and we distributed by mail 1200 questionnaires to undergraduate and graduate students from the Bucharest University of Economic Studies, from all its 11 faculties. The rate of response was of 37%, resulting in 444 valid questionnaires, which means a sufficiently large volume of data to obtain relevant results. The results obtained through the data collection process were analyzed using the specialized statistical software SPSS version 19, and AMOS version 18.

Results analysis and discussions

The statistical analysis of the collected data had four main directions of thinking: (1) what is the students awareness about the emotional knowledge they

have; (2) how much do they know about the specific way of transferring emotional knowledge; (3) how much they learned about emotional knowledge in schools, as a direct result of school's curriculum, and (4) how much do they know about knowledge dynamics and the importance of emotional knowledge in decision making. We have chosen as methods of analysis exploratory factorial analysis and confirmatory factorial analysis. Exploratory factorial analysis has the role of underlining the factors that could be identified from the sentences under analysis. Furthermore, to validate the exploratory factorial analysis and to obtain an exact measure of the processes of learning and using in business emotional knowledge a confirmatory factorial analysis was undergone.

The structure of the statistical population we investigated can be characterized by the followings: 81.56% undergraduate students with ages belonging to the interval of 19-23 years old, and 18.44% graduate students with ages belonging to the interval of 24-30 years old. This composition reflects the general structure of the undergraduate and graduate programs offered by our university. Among all the respondents, 63% are young ladies and 37% are young men. Some significant results from the descriptive statistics are presented in Table 1. For all the 40 variables the minimum value is 1, and the maximum value is 5.

Table 1. Descriptive statistics

No.	Variables	Mean Statistic	Std. Deviation
Q01	Emotions are important in understanding individuals behavior	4.33	0.834
Q02	Emotions are important in decision making	3.36	1.136
Q03	We are primarily emotional decision makers	3.46	0.997
Q04	Emotions are based on emotional knowledge	3.50	1.117
Q05	Emotional intelligence is processing emotional knowledge	3.77	0.983
Q06	Thinking is based on both cognitive and emotional knowledge	4.11	1.007
Q07	Emotional thinking is faster than rational thinking	4.20	1.048
Q08	Leaders influence their followers mostly through emotional knowledge	3.76	1.028
Q09	In business one must use his/her emotions	2.75	1.084
Q10	Basic emotions result in same facial expressions for everybody	3.06	1.469
Q11	Emotional knowledge can be transferred through facial expressions	3.76	1.068
Q12	Emotional knowledge can be transferred through body language	4.02	0.890
Q13	Emotional knowledge can be transferred through the tone of the voice	4.03	0.922
Q14	Emotional knowledge can be transferred through the verbal language	3.80	1.016
Q15	Emotional knowledge can be transferred through images	3.68	0.965

No.	Variables	Mean Statistic	Std. Deviation
Q16	Emotional knowledge can be transferred through dancing	3.64	1.056
Q17	Emotional knowledge can be transferred through music	3.93	0.972
Q18	Emotional knowledge can be transferred through touching	3.77	1.049
Q19	Most of our communication is done through emotional knowledge	3.50	0.918
Q20	Communicating emotional knowledge depends on the context much more than communicating cognitive knowledge	3.55	0.957
Q21	We learn about emotional knowledge in family	3.86	0.974
Q22	We learn about emotional knowledge in primary and secondary schools	2.95	1.152
Q23	We learn about emotional knowledge in high schools	3.11	1.175
Q24	We learn about emotional knowledge in university	3.00	1.216
Q25	We learn about emotional knowledge directly from our own experience	4.58	0.758
Q26	We learn in schools and university how to understand, and to manage emotional knowledge	2.66	1.215
Q27	We learn in schools and university how to communicate efficiently our emotional knowledge	2.74	1.196
Q28	We had in schools and university special courses about emotions and emotional knowledge	2.38	1.323
Q29	We can understand other people emotions only if we understand our own emotions	3.91	1.093
Q30	Education in schools and university should contribute much more to understanding and using efficiently our emotional knowledge	4.11	0.980
Q31	Using emotional knowledge we can understand much better people we work with	4.26	0.837
Q32	We can improve decision making by using our emotional knowledge	3.70	1.058
Q33	In negotiations we communicate better by using consciously both cognitive and emotional knowledge	3.98	0.968
Q34	In our mental process cognitive knowledge can be transformed into emotional knowledge and vice versa	3.49	0.951
Q35	Positive thinking is based on positive emotional knowledge	3.92	0.968
Q36	Negative thinking is based on negative emotional knowledge	3.76	1.068
Q37	Leadership involves both emotional knowledge and cognitive knowledge	4.29	0.878
Q38	Emotional knowledge is more important than cognitive knowledge in motivating people	3.82	0.986
Q39	Emotional knowledge is more important than cognitive knowledge in change management	3.24	1.006
Q40	Using emotional knowledge may contribute to generating consumers enthusiasm	4.10	0.877

Analyzing the statistic mean of the first 10 variables we remark a relatively low awareness of the importance of emotional knowledge in decision making (ex. Q02=3.36 and Q03=3.46). Furthermore, respondents are students in economics and business, and most of them cannot understand the practical importance of emotional knowledge in doing business (Q09=2.75). That means that for most of them the cognitive knowledge is the dominant kind of knowledge in decision making and solving business problems. From the next group of 10 variables we learn that most of the students know how emotional knowledge can be transferred (ex. Q12=4.02 and Q13=4.03), but they don't know the relative high importance of it in our communication (ex. Q19=3.50 and Q20=3.55). This conclusion comes as a logic consequence of the low awareness they have about the emotional knowledge. Examining carefully the next group of 10 variables we get the explanation for the above conclusions. Students learn very little about emotions and emotional knowledge in schools and universities (ex. Q22=2.95 and Q26=2.66). There is a lack of such kind of courses in their curriculum (Q28=2.38), and they learn about this emotional knowledge from their direct experience (Q25=4.58). Performing a detailed analysis of all the courses offered in the undergraduate and graduate programs in our university we found only one course in the curriculum of the *Business Administration* graduate program about *Knowledge Management*, while such kind of courses are extremely important for educating future specialists in economics and business. This assertion is supported by the respondents perception of the need of using efficiently emotional knowledge, as we see in the last group of 10 variables (ex. Q31=4.26 and Q37=4.29).

The method chosen to process in more details the collected data is factorial analysis, that allows identification of the most significant factors able to describe the statistical behavior of the considered population. To verify the accuracy of the method we have applied the Bartlett and Kayser-Meyer-Olkin (KMO) tests (Table 2). The KMO test allowed us to determine the efficiency of the application of factorial analysis onto the data collected. A small value of the KMO test (i.e. less than 0.7) underlines an inadequacy in utilizing the method of analysis onto the considered variables, whereas a large value of the test, converging to one, encourages the utilization of the method to sum up the information comprised in the variables. Both the Bartlett test and the KMO test suggested a very good accuracy for using the factorial analysis for the present research.

Table 2. KMO and Barlett test

Kaiser-Meyer-Olkin test		0.831
Barlett test	Approx. Chi-Square	5878.471
	Df.	780
	Sig.	0.000

The first step in the application of factorial analysis onto the set of data was the principal components extraction, by using the varimax orthogonal rotation. This rotation tries to maximize the variance of the factors components, leading to a smaller loading of variables onto every factor, and making the interpretation of the identified factors more facile. Thus, through the varimax orthogonal rotation we have obtained 11 identifiable factors comprising 60.243% of the information embedded in the original set of data (Table 3).

Table 3. Total variance explained for the first extraction

Items	Eigenvalues		
	Total	% of Variance	% Cumulative
1	6.939	17.348	17.348
2	3.158	7.894	25.242
3	3.080	7.701	32.943
4	1.889	4.722	37.665
5	1.690	4.224	41.889
6	1.597	3.993	45.882
7	1.308	3.270	49.152
8	1.205	3.012	52.164
9	1.126	2.816	54.980
10	1.087	2.718	57.698
11	1.018	2.545	60.243

By analyzing the composition of each factor in terms of initial variables, and the main four directions of investigation, we performed a second extraction of the main components, focusing on the first four factors. The structure of each factor in terms of the initial variables is presented in Table 4. The first factor contributing to 17.348% of the total variance, contains 16 variables and shows the level of awareness of respondents about emotional knowledge and its importance in management and leadership (Q01, Q05-Q08, Q31-Q33, Q37). The second factor is contributing to 7.894% of the total variance and contains 8 variables. It focuses on the specific ways of transferring emotional

knowledge (Q11-Q18). Most of the respondents know the fact that emotional knowledge can be transferred mainly through the body language and the tone of the voice.

Table 4. Rotated component matrix for 4 factors extracted

Factor 1	Factor 2	Factor 3	Factor 4
Q01 = 0.592	Q11 = 0.785	Q02 = 0.418	Q21 = 0.459
Q05 = 0.473	Q12 = 0.786	Q04 = 0.358	Q22 = 0.838
Q06 = 0.486	Q13 = 0.768	Q09 = 0.517	Q23 = 0.873
Q07 = 0.448	Q14 = 0.649	Q19 = 0.410	Q24 = 0.724
Q08 = 0.467	Q15 = 0.687	Q26 = 0.619	
Q20 = 0.371	Q16 = 0.700	Q27 = 0.663	
Q25 = 0.490	Q17 = 0.719	Q28 = 0.589	
Q29 = 0.333	Q18 = 0.703	Q32 = 0.454	
Q30 = 0.541			
Q31 = 0.664			
Q33 = 0.533			
Q35 = 0.371			
Q36 = 0.355			
Q37 = 0.633			
Q38 = 0.437			
Q40 = 0.606			

The third factor contributes to the 7.701% of the total variance, and contains 8 variables. It focuses mainly on the importance of emotional knowledge in our communication, and the ability we have in handling it. The fourth factor contributes only to 4.701% of the total variance, and contains 4 variables. It focuses mainly on the way formal education contributes to understanding and development of emotional knowledge. As we have seen from the descriptive statistics, formal education has almost no contribution to our understanding and using efficiently emotional knowledge.

A Cronbach coefficient alpha test was conducted on all four factors to test the reliability of all of the item variables. This was to determine the internal consistency of the scale used. The test results indicate higher values than 0.7 for factors 1, 2 and 4, and less but very close to 0.7 for the third factor. That means a good enough consistency of these factors, and consequently an adequate correctness (Table 5).

Table 5. Reliability statistics

Factors	Cronbach's Alpha	No. of items
1	0.813	16
2	0.882	8
3	0.663	8
4	0.764	4

To validate the results obtained we have run a confirmatory factorial analysis. Unlike the exploratory factorial analysis, in a confirmatory factorial analysis the variables are already observed and the aim of the analysis is to refine the influence measurement scale of each sentence comprised in the identified factors (Figure 1). We abbreviate with EKF – Emotional Knowledge Factor. As we can see there are three variables that do not have any direct influence on the four factors. They are: Q03 – *We are primarily emotional decision makers*, Q10 – *Basic emotions result in same facial expression for everybody*, and Q34 – *In our mental process cognitive knowledge can be transformed into emotional knowledge and vice versa*. That means that these variables have a generic value for the whole emotional knowledge management, and not just for one of the main factors identified using the explanatory factorial analysis.

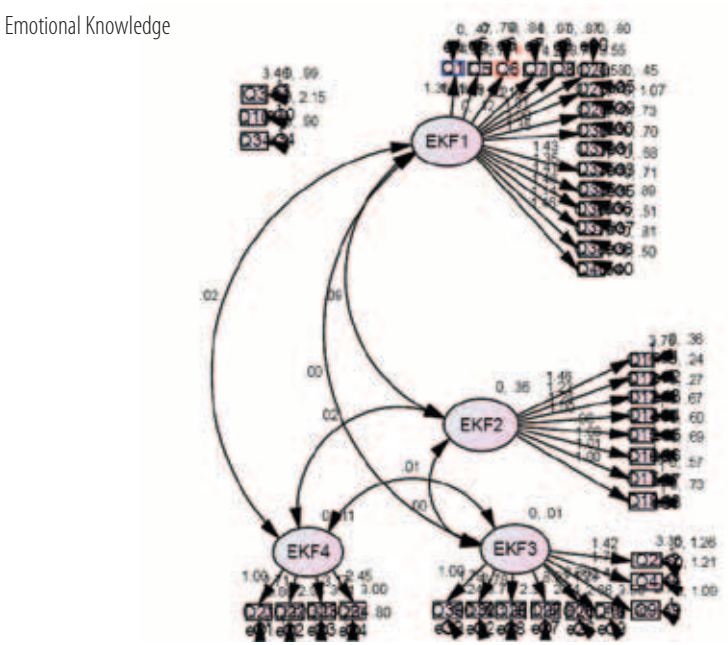

Figure 1. Confirmatory factorial analysis model

From the confirmatory factorial analysis using the software AMOS version 18, we obtained the synthetic data presented in the Table 6, that shows a good concordance with the exploratory factorial analysis.

Table 6. Confirmatory analysis results with AMOS version 18

Variables	Factors	Estimate	S.E.	C.R.
Q01	EKF1	1.359	0.235	5.782
Q05	EKF1	1.195	0.228	5.232
Q06	EKF1	1.186	0.230	5.163
Q07	EKF1	1.001	0.214	4.671
Q08	EKF1	1.207	0.234	5.156
Q20	EKF1	0.950	0.199	4.765
Q25	EKF1	1.007	0.186	5.415
Q29	EKF1	1.000		
Q30	EKF1	1.352	0.246	5.488
Q33	EKF1	1.429	0.255	5.616
Q35	EKF1	1.350	0.245	5.510
Q36	EKF1	1.409	0.261	5.400
Q37	EKF1	1.459	0.251	5.813
Q38	EKF1	1.136	0.222	5.113
Q40	EKF1	1.464	0.251	5.820
Q11	EKF2	1.457	0.112	13.047
Q12	EKF2	1.225	0.093	13.112
Q13	EKF2	1.259	0.096	13.051
Q14	EKF2	1.000		
Q15	EKF2	0.956	0.091	10.461
Q16	EKF2	1.077	0.101	10.694
Q17	EKF2	1.010	0.093	10.839
Q18	EKF2	1.004	0.099	10.184
Q02	EKF3	1.420	0.820	1.733
Q04	EKF3	1.751	0.935	1.873
Q09	EKF3	2.436	1.199	2.031
Q19	EKF3	1.293	0.714	1.811
Q26	EKF3	8.862	4.023	0.028
Q27	EKF3	8.922	4.050	2.203
Q28	EKF3	6.779	3.104	2.184
Q32	EKF3	1.786	0.934	1.912

Variables	Factors	Estimate	S.E.	C.R.
Q39	EKF3	1.000		
Q21	EKF4	1.000		
Q22	EKF4	2.707	0.393	6.885
Q23	EKF4	3.168	0.456	6.943
Q24	EKF4	2.453	0.368	6.666

Conclusions

Emotional knowledge has been recognized as a distinctive component of the tacit knowledge and the hidden part of the knowledge iceberg only recently, when research in cognitive science revealed the role of emotions in the decision making and mental processes. As that research demonstrates, cognitive knowledge and emotional knowledge are inextricably intertwined. There is a powerful dynamics of thoughts and emotions, that can be understood by using the thermodynamics metaphor. That means that cognitive knowledge may transform into emotional knowledge and vice versa, like energy from one form into another one. This is a challenging hypothesis based on metaphorical analysis that cognitive scientists have yet to prove.

The purpose of our research is to evaluate the degree of awareness of importance of emotional knowledge, and the contribution of education to that awareness at students in economics and business. We used both a qualitative and quantitative research. The qualitative research has been done to get the state-of-the-art in this field of emotional knowledge from literature in the field of knowledge management and leadership. For the quantitative research we developed a questionnaire comprising 40 questions, and distributing to 1200 of students. Finally, we processed 444 valid questionnaires by using the specialized software SPSS and AMOS. We performed an exploratory factorial analysis, and then a confirmatory factorial analysis. Results show that students have a level of awareness about the importance of emotional knowledge just above the statistical average of the analyzed population, and that education contributed very little to it. Education in schools and universities is based heavily on objective and scientific knowledge, as a result of European tradition of the Cartesian dualism of body and mind. Education should consider also the hidden part of the knowledge iceberg, and to introduce into its curriculum disciplines dedicated to emotional knowledge. Many students still consider cognitive knowledge to dominate their decision making and their

understanding of life and society. It is time to reconsider these students curriculum, especially to students in economics and business by introduce new courses about behavior economics and complex decision making, with emotional knowledge playing an important part.

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