

THE RELATIONSHIP BETWEEN INTELLIGENCE TYPE AND GENDER IN BUSINESS HIGHER EDUCATION

Maiorescu Irina¹, Sabou Gabriel Cristian² and Georgescu Bogdan³

^{1) 2) 3)}The Bucharest University of Economic Studies

E-mail: irina.maiorescu@com.ase.ro; E-mail: gabriel.sabou@com.ase.ro;

E-mail: bogdan.georgescu@mk.ase.ro

Abstract

The subjects related to business, taught in higher education institutions, require from students certain natural inclinations and certain types of intelligence. The areas a business specialist is to be prepared for greatly vary in terms of needed skills and cognitive processes. As such, based on the wide accepted theory of multiple intelligences issued by Howard Gardner, a quantitative research was deployed among students of Business and Tourism Faculty of Bucharest University of Economic Studies. Our aim was to identify the profile of Business and Tourism students in respect to the types of intelligence they are characterized by. Differences between genders were noticed in respect to logical/mathematical intelligence and high interpersonal intelligence was a common factor for the general studied population.

Keywords

Multiple intelligences, business, higher education, learning, skills.

JEL Classification

A20, D91, M53, O15

Introduction

The traditional and still actual way of assessing the capabilities of students and, sometimes, of employees' capabilities is by testing theoretical knowledge in the fields of logical – mathematical sciences and literature – languages literacy or their IQ (Gardner, 2006). The baccalaureate exams evaluate the capacity of students to memorize information and to solve problems of vocabulary, foreign languages understanding and/or sciences proficiency. Nevertheless, linguistic or logical/mathematical intelligence – the ones that officially “tag” the value of a student, does not necessarily imply that the respective person will be an excellent employee, regardless of the tasks he/she is required to perform. According to Howard Gardner (1993; 2006), people are characterized by a sum of different kinds of intelligence, present in various degrees: logical-mathematical, linguistic, spatial, musical, bodily-kinesthetic, interpersonal, intrapersonal, naturalist and existentialist intelligence. Even if Gardner (1993) never intended to apply multiple intelligence in education, many teachers use that theory to adapt their courses according to student's intelligence. According to Cerutti (2013), the theory of multiple intelligence represents an anatomical map of the mind, but the theory doesn't detail how the mind processes the information. Nevertheless, there is extensive research leading towards the conclusion that there are

distinct neural connections specific to each type of intelligence, with certain implications for education (Shearer & Karanian, 2017).

Various activities require various facets of the intelligence and studies have shown that companies oriented towards learning and improving are the ones that exploit the assets of the individual, while improving the latent ones (Kline & Saunders, 2010).

The purpose of all education systems is to prepare the individual for being integrated into society and for being accepted as a fit “wheel” in the labor market mechanism. Hence, education and training should address, as much as possible, all those types of intelligence required by the domain the individual is to be integrated within, both socially and professionally. The current paper aims to understand the profile of students enrolled into business bachelor program of Bucharest University of economic studies, by investigating their dominant types of intelligence, in order to better understand their needs in what concerns teaching materials and methods.

Linking performance in business with intelligent education

Research about human mind and the capacity of learning and applying knowledge efficiently for solving tasks and situations is very reach. Various theories have been issued about individual intelligence, learning styles, cultural influences upon cognition and their relation with the success in education. Nevertheless, they all are facets of the same phenomenon – human develop individual patterns of thinking, learning and making decisions in response to their unique set of physical and socio-cultural experiences and circumstances they encounter and have to deal with and adapt to (Kozhevnikov et al, 2014).

Business environment, unlike for instance health and care or arts environments, requires certain skills and knowledge. Thus, according to Martin (2018), linguistic intelligence is required for conversational skills, writing reports and business presentations; logical mathematical intelligence is useful for budgeting, project management, scientific facts based and objective decision-making; visual intelligence helps in marketing and product design; musical intelligence in recognizing and adapting the tone and volume of voices when speaking; bodily kinesthetic intelligence may help at computer keyboard typing and demonstrations about product functioning in front of customers; interpersonal intelligence is needed in sales, managers as it is the ability to understand the needs of others and to address these in the most appropriate manner; intrapersonal intelligence is important for employees – and especially for management to understand and use their strengths, while acknowledging their weaknesses and trying to improve these; naturalistic intelligence is useful for understanding the effects of the business and of the products /services offered upon environment, nowadays that there is a constant preoccupation for social accountability and sustainability.

The success of higher education programs in business administration is therefore linked, among other factors, with the intelligence profile students have. According to Gardner (2006), leadership involves complex approaches and requires a combination of high interpersonal, intrapersonal, logical-mathematical and spatial intelligence. It also depends on the particularities of genders’ cognition, as these are found to be influencing various types of intelligence. Thus, the female leaders score higher in linguistic intelligence than the males, while the males prove to have higher levels of logical-mathematical intelligence (Piaw & Don, 2014).

Research methodology and objectives

Although Gardner’s (1989) initial 7 types of intelligence list was enlarged to a 9 types of intelligence list by adding the extra two: naturalism and existentialism, Gardner (2006) himself calls for “caution” about this last one. From our point of view, existentialism - or the intelligence of “big questions” as he calls it, is linked to intrapersonal intelligence since

great questions about existence and a superior Intelligence start from questioning and trying to understand the inner self. As such, in our research about Multiple Intelligence patterns among Business bachelor students, only the first 8 intelligences were taken into consideration: linguistic, logical-mathematical, musical, bodily-kinesthetic, spatial, interpersonal, intrapersonal and naturalistic.

To this purpose a Multiple Intelligence Checklist with 80 items addressing the 8 mentioned categories of intelligence was printed and distributed to 214 students from the 3rd (last) year of Business and Tourism Faculty within Bucharest University of Economic Studies bachelor program. There were 158 female and 56 male respondents, reflecting the general structure of Business and Tourism 3rd year students' population. Students were required to assess themselves against the checklist and to calculate their scores for each of the intelligence types. The results were then introduced in Microsoft Excel and exported for being statistically analyzed with Minitab.

The main objective of the research was to identify whether there is a pattern of the way Business bachelor students' intelligence types are combined, since students in the final year already benefited from the training in business specific to a higher education institution and, consequently, certain skills and types of intelligence have been challenged and improved.

Results analysis

We analyzed the general level recorded for each type of intelligence among the studied population. The descriptive statistic was used in order to assess the mean of the genders, as well as the median. As it can be noticed (table no.1), male students have both median and average levels of logical mathematical intelligence higher than female students, while surprisingly, linguistic intelligence scores low for both men and women.

Table no. 1. Descriptive statistics for the intelligence levels of genders

Variable	Gender	Mean	Minimum	Median	Maximum	Skewness	Kurtosis
logical math.	m	5.607	0	6	9	-0.62	-0.41
interpersonal	f	5.203	0	5	9	-0.12	-0.61
intrapersonal	f	5.139	1	5	10	-0.07	-0.44
spatial	f	4.949	0	5	9	0.17	-0.38
intrapersonal	m	4.929	1	5	8	0.04	-0.21
interpersonal	m	4.839	1	5	9	0.04	-0.57
bodily kin.	m	4.768	0	5	8	-0.04	-0.75
musical	f	4.759	0	5	10	0.21	-0.68
spatial	m	4.589	0	5	8	-0.44	-0.3
bodily kin.	f	4.519	0	5	9	-0.25	-0.55
musical	m	4.321	0	4.5	9	-0.11	-0.21
logical math.	f	4.468	0	4	9	-0.06	-0.9
linguistic	f	3.886	0	4	9	0.34	-0.21
naturalist	f	3.804	0	4	9	0.4	-0.36
naturalist	m	3.464	0	4	8	0.13	-0.49
linguistic	m	3.768	0	3.5	7	-0.05	-0.32

Because only some of the skewness and kurtosis coefficients are very close to 0, we used Kolmogorov-Smirnov test for normality. All types of intelligence are normally distributed,

p-value<0.010; however, we chose to apply Mood median test for checking the differences between median intelligence levels of genders.

Table no.2. Mood Median Test: linguistic versus gender

Mood median test for linguistic					
Chi-Square = 0.74 DF = 1 P = 0.389					
				Individual 95.0% CIs	
gender	N≤	N>	Median	Q3-Q1	+-----+-----+-----+-----
f	106	52	4.00	2.00	(-----*)
m	34	22	3.50	2.00	(-----*-----)
				+-----+-----+-----+-----	
				3.00	3.60 4.20 4.80
Overall median = 4.00					
A 95.0% CI for median(f) - median(m) : (-1.00,1.00)					

Although the median of male population indicates lower levels (3.5), when tested for statistically significant difference against the group of female student, there were found no differences between genders’ linguistic intelligence levels (table no.2).

The next tested intelligence against gender was logical mathematical and, here, we found statistically significant differences between genders(table no.3).

Table no.3. Mood Median Test: logical mathematical versus gender

Mood median test for logical mathematical					
Chi-Square = 7.86 DF = 1 P = 0.005					
				Individual 95.0% CIs	
gender	N≤	N>	Median	Q3-Q1	+-----+-----+-----+-----
f	99	59	4.00	3.00	*-----)
m	23	33	6.00	4.00	(-----*-----)
				+-----+-----+-----+-----	
				4.0	5.0 6.0 7.0
Overall median = 5.00					
A 95.0% CI for median(f) - median(m) : (-3.00,0.00)					

The results show that male students have higher levels of logical mathematical intelligence, their median being situated at 6, while feminine population’ median is situated at 4.Nevertheless, overall median (5.00) is higher than the one for linguistic intelligence (table no. 2) and at the same level as the overall median for spatial intelligence (table no.4)

Table no.4. Mood Median Test: spatial versus gender

Mood median test for spatial					
Chi-Square = 0.28 DF = 1 P = 0.596					
				Individual 95.0% CIs	
gender	N≤	N>	Median	Q3-Q1	-----+-----+-----+-----
f	101	57	5.00	2.00	(-----*-----)
m	38	18	5.00	3.00	(-----*-----)
				-----+-----+-----	
				4.20	4.50 4.80
Overall median = 5.00					
A 95.0% CI for median(f) - median(m) : (0.00,1.00)					

According to these results, both genders have similar levels of visual – spatial intelligence, no statistical difference between groups being found. The same levels and situation is met for bodily kinesthetic intelligence (table no.5).

Table no.5. Mood Median Test: bodily kinesthetic versus gender

Mood median test for bodily kinesthetic				
Chi-Square = 0.20 DF = 1 P = 0.654				
				Individual 95.0% CIs
gender	N≤	N>	Median	Q3-Q1
f	104	54	5.00	3.00
m	35	21	5.00	3.00
				+-----+-----+-----+-----
				(-----*-----)
				(-----*-----)
				+-----+-----+-----+-----
				4.00 4.50 5.00 5.50
Overall median = 5.00				
A 95.0% CI for median(f) - median(m): (-1.00,1.00)				

No differences between genders were found (p-value of 0.654), the overall bodily kinesthetic intelligence of students’ median being situated at 5. Neither were these found when analyzed for musical intelligence (table no.6).

Table no.6. Mood Median Test: musical versus gender

Mood median test for musical				
Chi-Square = 2.04 DF = 1 P = 0.154				
				Individual 95.0% CIs
gender	N≤	N>	Median	Q3-Q1
f	99	59	5.00	3.00
m	41	15	4.50	3.00
				-----+-----+-----+-----
				(-----*-----)
				(-----*-----)
				-----+-----+-----+-----
				4.20 4.50 4.80
Overall median = 5.00				
A 95.0% CI for median(f) - median(m): (-1.00,1.00)				

Here, despite seemingly higher intelligence in women (median is 5.0), there are no statistic proofs of differences between genders (p value= 0.154). Also, the overall median is situated at 5.

In what concerns interpersonal intelligence – one of the skills required by leadership according to literature review, the overall median level is surprisingly at the same 5.0 level (table no.7).

Table no.7. Mood Median Test: interpersonal versus gender

Mood median test for interpersonal				
Chi-Square = 3.66 DF = 1 P = 0.056				
				Individual 95.0% CIs
gender	N≤	N>	Median	Q3-Q1
f	81	77	5.00	3.00
m	37	19	5.00	2.00
				---+-----+-----+-----+---
				*-----)
				(-----*
				---+-----+-----+-----+---
				4.20 4.80 5.40 6.00
Overall median = 5.00				
A 95.0% CI for median(f) - median(m): (0.00,2.00)				

The p-value is quite at the cut-off value for accepting the differences between genders levels of intrapersonal intelligence ($p=0.056$). According to the visual representation, it seems that women are more likely to be above the overall median. In order to check this, taking into consideration that there is a normal distribution, we used further on Kruskal – Wallis test. Although it indicates men group to be below overall median ($z=-1.18$), there is not enough evidence to claim a difference in the genders ($p\text{-value}=0.237$).

Table no.8. Mood Median Test: intrapersonal versus gender

Mood median test for intrapersonal					
Chi-Square = 2.28 DF = 1 P = 0.131					
Individual 95.0% CIs					
gender	N≤	N>	Median	Q3-Q1	
f	89	69	5.00	2.00	*-----)
m	38	18	5.00	2.00	*-----)
-----+-----+-----+-----+-----+-----					
5.10 5.40 5.70 6.00					
Overall median = 5.00					
A 95.0% CI for median(f) - median(m): (0.00,0.00)					

In what concerns intrapersonal intelligence, again, no differences were found between genders, the distribution of answers providing an overall median of 5.0. A lower median is found for both genders and for overall population in naturalist intelligence analysis (table no.9).

Table no.9. Mood Median Test: naturalist versus gender

Mood median test for naturalist					
Chi-Square = 0.00 DF = 1 P = 0.947					
Individual 95.0% CIs					
gender	N<	N≥	Median	Q3-Q1	
f	77	81	4.00	3.00	(-----*
m	27	29	4.00	3.00	(-----*
-----+-----+-----+-----+-----+-----					
3.00 3.30 3.60 3.90					
Overall median = 4.00					
A 95.0% CI for median(f) - median(m): (-1.00,1.00)					

This situation is not very surprising since Business education does not challenge naturalist intelligence related aptitudes. As such, the median level of 4 – below almost all other types of intelligence, was an expected value.

Limitations of the research

The research is limited to the specificity of the sample and to its size. We anticipate variations in the pattern of intelligence construct of students belonging to the same Bucharest University of Economic Studies, but studying other areas of Economy (i.e. Accounting, Marketing, Economic Cybernetics etc), as well as variations within the same Business and Tourism faculty between 1st year of study and 3rd year of study. However, these assumptions require further future research to become scientific facts.

Conclusions

Various fields of activity – and hence of education, require certain inclinations and skills. Multiple intelligences theory provides a solid framework for assessing the educational needs, with possible practical implications for business higher education optimization process. The current research aimed to analyze the way students enrolled in Business higher education bachelor program are characterized by multiple intelligences. It resulted that, except logical mathematical intelligence with higher levels for male students – both genders are similar in terms of various intelligence types' levels. Logical mathematical, interpersonal, intrapersonal, musical, spatial, bodily kinesthetic – are intelligences equally present in the studied population, while surprisingly, linguistic intelligence is lower, the median being similar with naturalist intelligence.

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