

**AN OVERVIEW ABOUT MULTIPLE INTELLIGENCES: A COMPARATIVE STUDY WITH BUSINESS ADMINISTRATION STUDENTS OF TWO PRIVATE UNIVERSITIES IN SOUTHERN BRAZIL**

*Luís Fernando Irgang dos Santos*  
*Universidade de Halmstad, Suécia*  
*E-mail: luis.irgang@hotmail.com*

*Nikolas Könzgen Huck*  
*Universidade Regional de Blumenau (FURB), Brazil*  
*E-mail: nikolaskhuck@gmail.com*

*Ronaldo Leão de Miranda*  
*Universidade Federal de Rondônia (UNIR), Brazil*  
*E-mail: ronaldo.miranda@unir.br*

*Franco da Silveira*  
*Universidade Federal do Rio Grande do Sul (UFRGS), Brazil*  
*E-mail: franco.da.silveira@hotmail.com*

*Submission: 1/12/2021*

*Accept: 2/2/2021*

**ABSTRACT**

Experts claim for more studies on Theory of Multiple Intelligences in higher education classrooms. There is a lack of information on the characteristics of multiple intelligence in universities in developing countries, such as Brazil, as they can assist in the education of students in a wide variety of fields. This study aims to analyze and compare the types of multiple intelligences among bachelor students of Business Administration programs in private universities. We conducted a quantitative study based on survey with students from two private universities in the southern Brazil. The results indicated that the academic profile of both programs has similarity in the average frequency of most of the identified intelligences. The intelligences identified that showed statistically significant differences between academics are: logical-mathematical, interpersonal, musical and naturalistic. In general, the most developed multiple intelligences are: logical-mathematical, interpersonal, intrapersonal and bodily-kinesthetic. In addition, the least developed are: spatial, linguistic, musical and naturalistic.

**Keywords:** Multiple Intelligences. University. Education. Business Administration

## 1. INTRODUCTION

The first psychological test for assessing intelligences (Galton, 1870) expressed a theoretical interest in the conception of intelligence through the observation of practical issues (Gardner & Hatch, 1989). Later, Binet and Simon (1916) developed the "Binet-Simon Test of Intelligence". The instrument consisted of performing quick tasks, usually involving logical-mathematical skills (Gould & Siqueira, 1991). However, the authors of this instrument, which today is also known as the Intelligence Quotient (IQ), stated that the measure of intelligence could not involve only one factor, as it is a complex phenomenon (Maia & Fonseca, 2002).

The relation between the IQ test and academic performance is one of the oldest findings and confirmed by Psychology (Reuchlin, 1991). Other tests for measuring intelligence were developed later. These tests used more elements in their analysis and usually consisted of analyzing children's performance when challenged to perform specific tasks and influenced by different environmental situations. This analysis represented an attitude towards the presented context, and not necessarily a natural predisposition (Maia & Fonseca, 2002).

Howard Gardner, a psychologist at Harvard University, coordinated a research group whose findings would result in what is now known as Theory of Multiple Intelligences (MI). Unlike tests like Alfred Binet's, this model addresses intelligence from multiple perspectives. This model is based in the observation of building blocks of intelligence used by sailors, surgeons, artists, children, etc. (Armstrong, 2009). To organize the types of intelligences, Gardner initially classified them into seven groups: linguistic, logical-mathematical, spatial, musical, bodily-kinesthetic, interpersonal and intrapersonal; and later it also included naturalistic intelligence (Travassos, 2001).

This new format of understanding about the human intellect implies a wide range of particular spectra of intelligence, which would lead people to understand their outstanding intelligences and to develop compatible occupations. According to Theory of MI, every human being has at least one well-developed intelligence, some people have up to two. There are rare individuals who have all the intelligences raised, as it is also difficult for an individual to have none of the developed intellectual spheres (Travassos, 2001).

Against this backdrop, this study aims to analyze and compare the types of multiple intelligences among bachelor students of Business Administration programs in private

universities. We conducted a quantitative study based on survey with students from two private universities in the southern Brazil.

The remainder of the article is structured in the following manner. First, section 2 presents an overview of the literature about intelligence. Section 3 explains the method adopted to develop the research. Section 4 presents and discusses the results of the study. Later, the final considerations are presented in section 5.

## **2. OVERVIEW OF THE LITERATURE**

Human intelligence is possibly one of the most researched topics in Psychology. Given the vast publication of articles in this area, it can be said that there is hardly a consensus on what intelligence is. Theories have varied according to their traditional study background and can be classified into factorial or psychometric, cognitive and developmental (Primi, 2002).

Intelligence, according to the scientific foundations of Psychology, originates as a cognitive and individual competence. In a society that excels in the individual's perceptiveness of intellectuality, being more or less intelligent means an important competence for social development. Much of social ascension is governed by people's intellectual capacity. The difference between individuals legitimates the idea that some people have the right to succeed, and others do not (Miranda, 1998).

In a broader sense, intelligence comprises the intellectual capacity of individuals to understand, choose the best path, have the conception of ideas, judgment and reasoning for solving problems (Antunes, 1998). According to Gardner (1994), the concept of intelligence is broader and includes the ability to solve problems or elaborate works that become important in the context inserted. This ability to solve problems is linked to achieving goals and finding viable paths to these goals (Travassos, 2001). The concept proposed by Gardner makes the understanding of intelligences plural, based on the premise that human intelligence is a complex system that can manifest itself in different ways in individuals (Ropelato et al., 2010).

Based on Gardner's Theory of MI, Armstrong (2009) classified the types of intelligences in 8 categories:

- a) Linguistic intelligence: consists of the ability of using words assertively, either orally or in writing. This intelligence is usually associated with poets, writers, lawyers and speakers;
- b) Logical-mathematical intelligence: it was the basis of the Binet-Simon test and so many other tests of intelligence. It is the ability of using numbers and logical reasoning effectively. The process models used in this intelligence consist of categorization, classification, inference, generalization, calculation and hypothesis testing;
- c) Spatial intelligence: it is the capacity for full and precise attention to the visual and spatial universe. It is commonly attributed to architects, graphic artists and designers, and aggregates the potential to recognize and manipulate color patterns, lines, shapes, space configuration and the relationships between elements;
- d) Musical intelligence: it is the sensitivity to sounds, rhythms, tones, melodies and timbres. It is an intelligence that enables a general understanding of music, its structures and patterns.
- e) Interpersonal intelligence: it is the ability of creating and sustaining relationships. It is knowing how to distinguish intentions, motivations and feelings in other people in a natural way. This intelligence involves the sensitivity to understand facial expressions, voice and gestures, signals and the ability to respond effectively to these factors. It is usually attributed to politicians, sales professionals, teachers, artists and religious leaders.
- f) Intrapersonal intelligence: perceived through self-knowledge, aggregates the ability to react in response to this knowledge and to use the self-knowledge to regulate different aspects of life. People with this intelligence have the capacity for self-discipline, self-understanding and self-esteem.
- g) Naturalistic intelligence: characterized by competence in recognizing the diverse species of flora and fauna, the environment and the individual. It is more evident in individuals who live in the midst of nature.
- h) Bodily-kinesthetic intelligence: implies using one's own body to solve problems. Usually attributed to high performance athletes, artisans, dancers and actors, it is the ability to control, express and coordinate body movements.

From the Theory of MI, Gardner (1994) states that most people can develop each type of intelligence at a level compatible with their needs, according to the received stimuli and instructions. For example, a study suggested that linguistic intelligence is presented at different levels in students of Accounting, History and Literature courses at a university in southern Brazil (Walter et al., 2008). In the same way, another study remarked that students develop predominant types of intelligences in accordance with the field of study. For example, while students of technology-related courses tend to develop logical-mathematical intelligence students of Health Science courses develop naturalistic intelligence (Ropelato et al., 2011).

Previous studies linked the development of multiple intelligences with specific pedagogical methodologies and teaching and learning processes. For example, a study carried out in China demonstrated that the design of teaching models with game platforms can stimulate the development of certain multiple intelligences in school-age children (Hong & Chen, 2018). Another study showed that teaching strategies such as self-reflection and concept exploration can be effective in improving specific types of multiple intelligences (Winarti; Yuanita & Nur, 2019). Overall, the Theory of MI contributes to the teaching-learning process in the sense of providing to the teachers an understanding on the appropriate strategies to stimulate and develop specific intelligences and improve the academic performance of students.

### **3. METHOD**

To analyze and compare the types of multiple intelligences among bachelor students in Business Administration programs, we developed a descriptive study based on a survey. Descriptive research aims to describe the characteristics of a population or phenomenon, or to establish a relationship between variables (Gil, 2008). Surveys promote a quantitative or numerical characterization of the attitudes, trends and opinions of a population and seek to know and interpret reality without interfering with it (Creswell, 2010).

For the development of the study, we selected bachelor students from Business Administration programs at two private universities in the southern region of Brazil. The Private University “A” (UPA), is located in Santa Catarina (SC). The Private University “B” (UPB) is located in Rio Grande do Sul (RS). The population of this study consisted of academics who study at different periods of the Business Administration programs at these

universities, considering that multiple intelligences can be stimulated throughout academic life (Walter *et al.*, 2008; Ropelato *et al.*, 2011).

In the period of development of this study, the Business Administration program at UPA had a total of 366 students, while Business Administration program at UPB had a total of 178 students. The sample calculation suggests that, for statistical validation, the sample must be composed of at least 188 students from the UPA and 122 students from the UPB, considering sample error rates of 5% and 95% confidence level. The collection followed the simple random sampling standard, which is configured in a probabilistic sample. This pattern indicates that each observed element has the same probability of being chosen for observation as all the others (Ropelato *et al.*, 2011).

Data collection was carried out at both universities between August and September 2019, and the questionnaires were applied by the first and second authors. A total of 216 respondents from the UPA (approximately 60% of the population) and 114 from the UPB (approximately 64% of the population) were reached. As a collection instrument, an adaptation of the questionnaire proposed by Armstrong (2009), called the Multiple Intelligence Inventory (IMM), was used. This instrument consists of 81 questions that address the intelligences proposed by the Theory of MI, arranged in eight dimensions: 11 statements for linguistic intelligence and 10 for each of the other seven intelligences (spatial, logical-mathematical, musical, naturalistic, interpersonal, intrapersonal and bodily-synesthetic), totaling 81 questions (Walter *et al.*, 2006; Ropelato *et al.*, 2011)

The questions of the instrument are linked to outstanding characteristics of multiple intelligences, such as: “I do at least one sport or physical activity regularly” for bodily-synesthetic intelligence; or “I am sensitive to colors”; referring to spatial intelligence. Following the methodology adapted by Ropelato *et al.* (2011), in the printed questionnaire, respondents were asked to mark “1”, when the statement applied to their profile, or “0” if they did not identify themselves with the characteristic or skill described in the affirmative. Therefore, the study variables are characterized as dichotomous. As the linguistic intelligence has one more statement than the other intelligences in the questionnaire, to calculate the average percentages of each intelligence we added the quantities of alternatives that each respondent pointed out and divided that number by the total possibilities, that is, the number of respondents was multiplied by the number of questions (see Ropelato *et al.*, 2011).

To characterize the respondents' profile, questions were also included in the instrument that allowed the collection of information about gender, age and semester period

of the course in which the respondent was studying at the time of the questionnaire application. In the recording and tabulation of the collected data, an electronic spreadsheet of the Microsoft Excel software was used. For analysis of variance of the data, the Analysis of Variance - Anova test was used (Hair *et al.*, 2005). The homogeneity of the variances was also verified through the Levene test, which is one of the most important tests for this purpose and robust in terms of deviations from normality (Marôco, 2018).

To check the significance between the mean of the intelligences of the two courses, the t-test of equality of the means for two paired samples was used, which is performed when two different groups are analyzed, but there is a common characteristic by which the two groups can be compared (Marôco, 2018). These tests were performed using the Statistical Package for the Social Sciences (SPSS) software in version 21.0. Finally, to justify the multiple intelligences of academics from different semester periods of the bachelor programs in Business Administration at both universities, the approach of Wenningkamp *et al.* (2017), which proposes the identification of disciplines that stimulate the development of specific intelligences.

#### 4. PRESENTATION AND ANALYSIS OF RESULTS

This section presents the study results. We initially presented the characterization of the sample (see Table 1). As shown in Table 1, it is possible to verify that the majority of participants from UPA are male (52.78%). Conversely, the majority of respondents in the UPB are female, representing a total of 59.65% of respondents. In general, considering the total number of respondents, 51.51% are female and 48.49% are male, representing an almost homogeneous distribution.

Table 1: Characterization of the respondents' profile by university and gender

Gender	UPA		UPB		Total	
Female	102	47.42%	68	59.65%	170	51.51%
Male	114	52.78%	46	40.35%	160	48.49%
<b>Total</b>	<b>216</b>	<b>100.00%</b>	<b>114</b>	<b>100.00%</b>	<b>330</b>	<b>100.00%</b>

Source: Research data (2021).

Table 2 shows the classification of the participants by course in relation to the age group.

Table 2: Classification of respondents by course and by age group

Age Range	UPA		UPB		Total	
17 to 20 years	117	54.17%	40	35.09%	157	47.58%
21 to 25 years	85	39.35%	49	42.98%	134	40.61%
26 to 30 years	12	5.56%	18	15.79%	30	9.09%
31 to 35 years	1	0.46%	4	3.51%	5	1.51%

36 to 40 years	0	0.00%	3	2.63%	3	0.91%
Above 41 years	1	0.46%	0	0.00%	1	0.30%
<b>Total</b>	<b>216</b>	<b>100.00%</b>	<b>114</b>	<b>100.00%</b>	<b>330</b>	<b>100.00%</b>

Source: Research data (2021).

According to Table 2, in UPA the vast majority of students are between 17 and 20 years old (54.17% of respondents) and another significant portion is in the 21 to 25 age group (39.35%), while only 5.56% are between 26 and 30 years old and less than 1% say they are over 31 years old. In UPB 35.09% of the students are 20 years old or younger and 42.98% are between 21 and 25 years old. In turn, 15.79% of respondents are in the age group of 26 to 30 years old, while just over 6% are 31 years old or more. In general, it can be concluded that more than 97% of respondents in both programs are aged 30 years or less.

Finishing the characterization of the respondents' profile and with the objective of comparatively analyzing the multiple intelligences identified in the students of different semester periods, there was a need to classify the respondents according to the semester period. Thus, this division is shown in Table 3.

Table 3: Classification of students by course and by semester period

Semester Period	UPA		UPB		Total	
1st to 3rd semester	63	29.17%	31	27.19%	94	28.48%
4th to 6th semester	98	45.37%	35	30.70%	133	40.30%
7th to 9th semester	55	25.46%	48	42.11%	103	31.22%
<b>Total</b>	<b>216</b>	<b>100.00%</b>	<b>114</b>	<b>100.00%</b>	<b>330</b>	<b>100.00%</b>

Source: Research data (2021).

Considering that the UPA Business Administration program lasts 4 years (8 semesters) and the UPB Business Administration program lasts 4 and a half years (9 semesters), the respondents were divided into 3 periods: the beginners (1st to 3rd semester), intermediaries (4th to 6th semester) and graduates (7th to 9th semester). Therefore, when the questionnaires were applied, 29.17% of the UPA respondents were in the first semesters of the program, while in the UPB this portion represented 27.19% of the total. Students who qualified in the intermediate semesters represented 45.37% at UPA and 30.70% at UPB. Finally, the graduates consisted of 25.46% of UPA students and 42.11% of UPB students.

To comparatively analyze the multiple intelligences identified in the students of the two universities from the Multiple Intelligences Inventory (Armstrong, 2009), the average frequencies of each intelligence type in percentage were calculated. Table 4 allows us to identify that, in the UPA students, the most present intelligences are intrapersonal (61.53%), followed by bodily-kinesthetic (60.05%), logical-mathematical (59.77%) and interpersonal (59.03%). For the UPB students, the most common intelligence is logical-mathematical



(56.78%), followed by intrapersonal (56.46%), bodily-kinesthetic (54.55%) and musical (53.75%).

Likewise, the intelligences with less frequency in the respondents of both universities are the naturalistic intelligence (42.69% in students from UPA and 41.23% in students from UPB), linguistics (45.41% in academics from UPA and 46.01% in students from UPB) and space (51.71% in students from UPA and 48.56% in students from UPB).

Table 4: Average percentage of frequency of multiple intelligences per course

Multiple Intelligences	UPA	UPB	Difference (%)
Linguistic	45.41%	46.01%	0.60%
Logical-mathematical	59.77%	56.78%	2.99%
Spatial	51.71%	48.56%	3.15%
Interpersonal	59.03%	52.23%	6.79%
Bodily-kinesthetic	60.05%	54.55%	5.50%
Musical	55.79%	53.75%	2.04%
Intrapersonal	61.53%	56.46%	5.07%
Naturalistic	42.69%	41.23%	1.46%

Source: Research data (2021).

In addition to the frequency of intelligences in the respondents, Table 4 shows that there is great similarity between the multiple intelligences identified in the students of both universities, showing homogeneity in the characteristics of the students' profile. The intelligences that most present discrepancies between academics are interpersonal (difference of 6.79%), body-synesthetic (difference of 5.50%) and intrapersonal (difference of 5.07%). The intelligences with differences in the lower percentage frequencies were linguistic (0.60%) and naturalist (1.46%).

Furthermore, the analysis of variance test (ANOVA) allows to verify the existence of significant differences between the samples of the two courses in question, as shown in Table 5.

Table 5: Analysis of variance test between Business courses

Multiple Intelligences		Sum of Squares	Degrees of freedom	Average squared	F	Sig.
Linguistic	Between Groups	3253,633	1	3253,633	0.086	0.770
	In groups	12415655,458	328	37852,608		
	Total	12418909,091	329			
Logical-mathematical	Between Groups	53899,034	1	53899,034	1.101	0.295
	In groups	16060070,663	328	48963,630		
	Total	16113969,697	329			
Spatial	Between Groups	21770,379	1	21770,379	0.582	0.446
	In groups	12263199,318	328	37387,803		
	Total	12284969,697	329			
Interpersonal	Between	18431,021	1	18431,021	0.489	0.485

	Groups					
	In groups	12365811,404	328	37700,645		
	Total	12384242,424	329			
Bodily-kinesthetic	Between Groups	15,993	1	15,993	0.000	0.983
	In groups	11009953,704	328	33566,932		
	Total	11009969,697	329			
Musical	Between Groups	83030,347	1	83030,347	1,651	0, 200
	In groups	16497848,441	328	50298,318		
	Total	16580878,788	329			
Intrapersonal	Between Groups	2488,437	1	2488,437	0.088	0.767
	In groups	9269057,018	328	28259,320		
	Total	9271545,455	329			
Naturalistic	Between Groups	53023,037	1	53023,037	1.103	0.294
	In groups	15767855,750	328	48072,731		
	Total	15820878,788	329			

Source: Research data (2021).

Through the Anova Test, it was found that there was no statistically significant variance between the courses, since all presented significance greater than 0.05. Thus, we proceeded with the Levene Test (Table 6), with the objective of attesting the homogeneity of the variances (Ropelato *et al.*, 2011).

Levene's test presented in table 6 shows that the variances in multiple intelligences between the Administration courses are equivalent, since all results were greater than 0.05 (Ropelato *et al.*, 2011).

Table 6: Levene's test for business courses

Multiple Intelligences	Levene statistics	Degrees of Freedom 1	Degrees of Freedom 2	Sig.
Linguistic	0.507	1	328	0.477
Logical-mathematical	1,185	1	328	0.277
Spatial	0.781	1	328	0.378
Interpersonal	1,595	1	328	0.208
Bodily-kinesthetic	0.473	1	328	0.492
Musical	0.851	1	328	0.357
Intrapersonal	0.143	1	328	0.706
Naturalistic	1,033	1	328	0.856

Source: Research data (2021).

Considering the results of the Anova Test and the Levene Test, which attested to homogeneity and non-significant variance between the samples, the t-test for equality of means for two paired samples was performed (Table 7), since the respondents belong to two different samples, but with characteristics in common (in this case, all respondents are bachelor students of Business Administration programs).

Table 7: t-test for equality of means between courses

Multiple	Average	Standard deviation	Mean standard error	t	Degree of Freedom	Sig.
----------	---------	--------------------	---------------------	---	-------------------	------

Intelligences between Courses						
Linguistic	0.06095180	0.61844653	0.03404436	1,790	329	0.074
Logical-mathematical	0.10356535	0.144170389	0.00780054	13,277	329	0.000
Spatial	0.04099944	0.49862735	0.02744853	1,494	329	0.136
Interpersonal	-0.05907833	0.32250248	0.01775318	-3.328	329	0.001
Bodily-kinesthetic	0.06692729	0.64986089	0.03577366	1,871	329	0.062
Musical	0.10502267	0.22358728	0.01230807	8.533	329	0.000
Intrapersonal	0.01020258	0.46201768	0.02543324	0.401	329	0.689
Naturalistic	0.10439246	0.11768541	0.00647837	16,114	329	0.000

Source: Research data (2021).

In this type of test, two hypotheses are adopted to be tested, the null hypothesis and the alternative hypothesis. The null hypothesis (H0) predicts that the average differences between the measured variables is 0; while the alternative hypothesis (H1) predicts that the average differences between the variables are different from 0. As shown in Table 7, it can be concluded that the average differences of multiple intelligences between the students of the two universities are different from 0, that is, H0 is rejected and H1 is accepted. However, only the average differences between logical-mathematical, interpersonal, musical and naturalistic intelligences are statistically significant (Sig <0.05).

To provide a better understanding of the multiple intelligences identified among bachelor students of the two universities, we followed the approach of the approach of Wenningkamp *et al.* (2017) and analyzed the multiple intelligences of students from different semester periods of the bachelor programs. Thus, Table 5 presents the multiple intelligences of the respondents per course and per semester period.

Based on the indices presented in Table 8, it is possible to identify the types of intelligences most presented in the students from different semester periods of each program. Considering that the programs of both institutions are based on the proposals of the National Education Council for the construction of their curricular matrix, it is assumed that they enable the training of professionals with specific skills and abilities inherent to the exercise of Business Administration, in a similar way.

Table 8: Multiple intelligences of academics for semester periods

Multiple Intelligences	1st to 3rd semester		4th to 6th semester		7th to 9th semester	
	UPA	UPB	UPA	UPB	UPA	UPB
Linguistic	45.74%	55.56%	44.34%	45.71%	46.94%	43.94%
Logical-mathematical	59.05%	61.29%	58.88%	64.29%	62.18%	61.88%
Spatial	47.30%	50.65%	53.88%	55.14%	52.91%	53.96%
Interpersonal	58.57%	54.84%	61.22%	58.57%	55.64%	58.33%
Bodily-kinesthetic	59.52%	53.42%	62.24%	61.14%	56.73%	60.83%
Musical	55.56%	52.61%	55.00%	51.86%	54.45%	56.25%
Intrapersonal	61.11%	60.65%	61.63%	62.57%	61.82%	62.71%

Naturalistic	39.84%	43.87%	45.10%	46.86%	41.64%	45.21%
--------------	--------	--------	--------	--------	--------	--------

Source: Research data (2021).

Following the approach proposed by Wenningkamp *et al.* (2017), we elaborated Frame 1 to show the main multiple intelligences of students in according to the semester periods and related the development of such intelligences with the courses offered in each period, based on the curricular plan.

Frame 1: Relationship between the main multiple intelligences and program course

1st to 3rd semester		
Program	Featured Intelligences	Courses
UPA	- Intrapersonal (61.11%)	University, Science and Research; and Scientific Language.
	- Bodily-synesthetic (59.52%)	Written and Oral Communication; Sports Practice and Pounds.
	- Logical-mathematical (59.52%)	Basic Math; Accounting Applied to Business; Mathematics Applied to Business (I and II); Tax Accounting; International Economics and Statistics.
	- Interpersonal (58.57%)	Written and Oral Communication, Organizational Psychology, Communication and Society, Ethical Dilemmas and Citizenship, Administration and Entrepreneurship; and Pounds.
UPB	- Logical-mathematical (61.29%)	Fundamentals of Macroeconomics; Fundamentals of Mathematics; General Accountability; Elements of Economy and Finance; Fundamentals of Microeconomics; Sales Administration; Structure of Financial Statements; and Tax Law.
	- Intrapersonal (60.65%)	Organizational Planning and Strategies; and Philosophy and Ethics.
	- Linguistic (55.56%)	Reading and Textual Production; Theory of Administration (I and II); Tax law; Philosophy and Ethics; and Research in Applied Social Sciences.
	- Interpersonal (54.84%)	Entrepreneurial Administration; Fundamentals of Marketing; Marketing Strategies; Sales Administration.
4th to 6th semester		
Program	Featured Intelligences	Courses
UPA	- Bodily-kinesthetic (62.24%)	Human Resources Internship; and Internship in Logistics.
	- Intrapersonal (61.63%)	Analysis of Business Processes; Human Resources Internship; and Internship in Logistics.
	- Interpersonal (61.22%)	Human Resources Administration (I and II); Human Resources Internship; Marketing I.
	- Logical-mathematical (58.88%)	Analysis of Business Processes; Study of Costs Applied to Business; Microeconomics; Financial math; Resources Management; Financial Management; Macroeconomics; Operational Research; Logistics; Financial Administration; Logistics Internship; Advanced Management and Accounting; and Capital Market.
UPB	- Logical-mathematical (64.29%)	Accounting and Costs Management; Statistics; Financial Analysis; Fundamentals of Production and Operations; Logistics; and Organizational Practices.
	- Intrapersonal (62.57%)	Formation and Development of the Brazilian Society; Business Creation and Formalization; Logistics; and Organizational Practices.
	- Bodily-kinesthetic (61.14%)	Organizational Behavior; and Organizational Practices.

	- Interpersonal (58.57%)	Fundamentals of Human Resources; Organizational Behavior; Human Resources Strategies; and Organizational Practices.
<b>7th to 9th semester</b>		
<b>Program</b>	<b>Featured Intelligences</b>	<b>Courses</b>
<b>UPA</b>	- Logical-mathematical (62.18%)	Analysis of Investments; Production and Operations Administration (I and II); Formation of Sales Prices; Sales Administration; Production and Operations Internship.
	- Intrapersonal (61.82%)	Strategic Planning; Formation of New Enterprises; Production and Operations Internship; and Business Economics (Business Game).
	- Bodily-kinesthetic (56.73%)	Marketing internship; Sales Administration; and Business Economics (Business Game).
	- Interpersonal (55.64%)	Marketing II; Marketing internship; Sales Administration; Formation of New Enterprises; Production and Operations Internship; and Business Economics (Business Game).
<b>UPB</b>	- Intrapersonal (62.71%)	Organizational Architecture; Decision Support Systems; Elaboration and Analysis of Projects and Business; Course Completion Project; and Course Completion Work.
	- Logical-mathematical (61.88%)	Production and Operations Strategies; Technology and Innovation Management; Operational Research; Finance Strategies; and Business Budget.
	- Bodily-kinesthetic (60.83%)	Course Completion Project; and Course Completion Work.
	- Interpersonal (58.33%)	Organizational Architecture; Course Completion Project; and Course Completion Work.

Source: Research data (2021).

From Frame 1, it can be seen that in both UPA and UPB, logical-mathematical intelligence stands out in all semester periods. This result can be justified because the bachelor programs offer a large number of courses that involve the application of knowledge related to this type of intelligence, which refers to the ability to analyze problems with logic, to perform mathematical operations and to investigate issues scientifically (Gardner, 1995; Armstrong, 2009).

Another result that also draws attention, refers to intrapersonal and interpersonal intelligences. The first involves the capacity for self-discipline, self-understanding and self-esteem directed to an efficient individual work model; while the second stands out for its talent in understanding and relating to others (Gardner, 1995; Armstrong, 2009). It is noted that, although few disciplines are offered that stimulate the development of these intelligences in the courses, they are present among academics. This is because they are personal intelligences, which are developed from the experiences of individuals and their own perception of themselves and the context in which they are inserted throughout life.

Another intelligence identified with great frequency among students from all semester periods is bodily-kinesthetic, related to the ability to use the body to solve problems or manufacture products (Gardner, 1995; Armstrong, 2009). As with intrapersonal and

interpersonal intelligences, it appears that the curricular matrix of both programs offers few courses that explicitly encourage the development of this intelligence. However, it can be stated that students develop bodily-synesthetic intelligence throughout the academic journey, as both programs aim to train professionals with leadership skills, dynamic expression and communication.

Among the less developed intelligences over the semester periods analyzed, is linguistic intelligence, which stood out only among academics in the first semester periods in the UPB. This intelligence, which is related to the sensitivity of the assertive use of words in spoken and written form (Gardner, 1995; Armstrong, 2009), is of paramount importance for the formation of a good business professional. For the development of this type of intelligence, Armstrong (2009) suggests to teachers the intensive use of lectures, discussions and debates, word games, oral reading and writing essays.

Spatial intelligence, which appears among those with less frequency among students, is related to the ability to recognize and manipulate the visual and spatial universe (Gardner, 1995; Armstrong, 2009). For the development of such intelligence, Armstrong (2009) suggests that teachers have to adopt methodologies that involve working with graphics, maps, videos, Lego sets, art materials, optical illusions, cameras, image library and maps mental, in order to stimulate the visual / spatial cognitive functioning.

With low frequency recorded in relation to the others, musical intelligence also appears. Such intelligence is related to the sensitivity to sounds, rhythms, tones, melodies and timbres (Gardner, 1995; Armstrong, 2009). To stimulate the development of such intelligence, Armstrong (2009) suggests the use of music, videos and musical instruments in the classroom.

Finally, another intelligence with low frequency among students is naturalistic intelligence, related to competence in recognizing the diverse species of flora and fauna, the environment and the individual (Gardner, 1995; Armstrong, 2009). To stimulate this intelligence, Armstrong (2009) suggests the connection of the contents covered in the disciplines with phenomena of nature and with sustainability, emphasizing the importance of caring for the environment for the preservation of species.

## 5. FINAL CONSIDERATIONS

It is notable that the Theory of MI leveraged studies on intelligences to reach the level of multifaceted, complex analysis and considering several types of cognitive developments in

its conception. It is in this context that the study was motivated and sought to deliver a contribution, testing the theory in an academic context in the management area, with the proposal of comparatively analyzing the types of multiple intelligences identified in bachelor students of Business Administration programs of two private universities in southern Brazil.

It is concluded, with the presented results, that the profile of the academics of both universities are similar with regard to multiple intelligences. The intelligences identified that showed statistically significant differences between academics were logical-mathematical, interpersonal, musical and naturalistic. In general, the most developed multiple intelligences were logical-mathematical, interpersonal, intrapersonal and bodily-synesthetic; while the least developed were spatial, linguistic, musical and naturalistic.

From the verification of the multiple intelligences identified in the students more and less frequently, it is possible to know the profile of future Business Administration professionals. Thus, it was possible to make comparisons of the skills and competences of these professionals with the skills and competencies required by the job market and by society in general, given the importance that this profession represents for the development and prosperity of organizations. Therefore, from such analysis, teachers, course coordinators and students themselves can help to improve the teaching-learning process, acting strategically in academic performance based on multiple intelligences.

For future research, we suggest to re-apply the inventory of multiple intelligences to the same respondents in other semester periods of the programs, in order to monitor the development of multiple intelligences during their academic journey. We also suggest to use the concepts and instruments presented to conduct the study with students from other programs, universities and contexts, expanding the understanding of multiple intelligences and comparing their development in different areas of knowledge.

## REFERENCES

- Antunes, C. (1998). Multiple intelligences and their stimuli. **Papirus Publisher**.
- Armstrong, T. (2009). **Multiple intelligences in the classroom**. Ascd.
- Binet, A., & Simon, T. (1916). **The development of intelligence in children: The Binet-Simon Scale**. Williams & Wilkins Company.
- Colauto, R. D., & Beuren, I. M. (2004). **Data Collection, Analysis and Interpretation**. In: Beuren, IM (Org). How to prepare monographic works in accounting: theory and practice. 2. ed. - São Paulo: Atlas.
- Creswell, J. W. (2010). **Research project: qualitative, quantitative and mixed methods**. 3. ed. Porto Alegre: Artmed: Bookman.

- Galton, F. (1870). **Hereditary genius**: an inquiry into its laws and consequences. D. Appleton.
- Gardner, H. (1994). **Structures of the mind**: the theory of multiple intelligences. Medical Arts.
- Gardner, H., & Hatch, T. (1989). Educational implications of the theory of multiple intelligences. **Educational researcher**, 18(8), 4-10.
- Gardner, H., & Veronese, M. A. V (1995). **Multiple intelligences**: theory in practice.
- Gil, A. C (2008). **How to design research projects**. 4. ed. São Paulo: Atlas.
- Gould, S. J., & Siqueira, V. L (1991). **The false measure of man**. São Paulo: Martins Fontes.
- Haier, R. J., Nuechterlein, K. H., Hazlett, E., Wu, J. C., & Paek, J. (1988). Cortical glucose metabolic rate correlates of abstract reasoning and attention studied with positron tomography. **Intelligence**, 12, 199-217.
- Hair J. R., Babin, B., Money, A. H., & Samouel, P. (2005). **Fundamentals of management research methods**. Porto Alegre: Bookman.
- Hong, X., & Chen, F. (2018). Development of Children's Multiple Intelligence Based on Computer Educational Game Platform. In **IOP Conf. Series: Materials Science and Engineering, New York-USA**.
- Maia, A. C. B., & Fonseca, M. L. (2002). Intelligence quotient and reading acquisition: a correlational study. **Psicologia, Reflexão e Crítica**, 15(2), 261.
- Marôco, J. (2018). **Análise Estatística com o SPSS Statistics**.: 7ª edição. ReportNumber, Lda.
- Oliveira-Castro, J. M., & Oliveira-Castro, K. M. (2001). The Adverbial Function of "Intelligence": Definitions and Uses in Psychology. **Psicologia: Teoria e Pesquisa**, 17(3), 257-264.
- Primi, R. (2002). Inteligência fluida: Definição fatorial, cognitiva e neuropsicológica. **Paidéia** (Ribeirão Preto), 12(23), 57-75.
- Reed, T. E., & Jensen, A. R. (1992). Conduction velocity in a brain nerve pathway of normal adults correlates with intelligence level. **Intelligence**, 16(3-4), 259-272.
- Reuchlin, M. (1991). **Les différences individuelles à l'école: aperçu et réflexions sur quelques recherches psychologiques**. Presses Universitaires de France-PUF.
- Ropelato, M et al. (2011). Multiple intelligences: a comparison between different teaching centers in a university. **REGE Revista de Gestão**, 18(2), 211-224.
- Travassos, L. C. P. (2001). Multiple intelligences. **Journal of Biology and Earth Sciences**.
- Walter, S. A., & Schneider, M. A. (2006). Expanding and developing learning through multiple intelligences. **International Colloquium on Local Power**, 10, 1-15.
- Walter, S. A., Schneider, M. A., Frega, J. R., & Domingues, M. J. C. S. (2008). Similarities and divergences in the development of multiple intelligences in an accounting science course: a comparison between courses, classes and genres. In: **USP Controller and Accounting Congress**, 9., 2008, São Paulo. Anais. São Paulo: USP.
- Wang, F. (2017). Study on the Application of Multi Intelligence Theory in College Music Teaching and Teaching Design Innovation. **Technical Bulletin**, 55(18).





Wenningkamp, K. R., de Pereira Franca, L., Battisti, P. S. S., & Walter, S. A. (2017). Multiple Intelligences: A Study in the Executive Secretariat Course at Unioeste, Toledo/PR Campus/Inteligencias Múltiplas: Um Estudo No Curso De Secretariado Executivo Da Unioeste, Campus De Toledo-Pr. **Revista Expectativa**, 16(16), 56-81.

Winarti, A., Yuanita, L., & Nur, M. (2019). The Effectiveness of Multiple Intelligences Based Teaching Strategy in Enhancing the Multiple Intelligences and Science Process Skills of Junior High School Students. **Journal of Technology and Science Education**, 9(2), 122-13.

