

THEORY OF MULTIPLE INTELLIGENCE AND STUDENT ACADEMIC EDUCATION: A CASE STUDY AT THE FEDERAL UNIVERSITY OF RIO GRANDE

A TEORIA DAS INTELIGÊNCIAS MÚLTIPLAS E A FORMAÇÃO ACADÊMICA DE ESTUDANTES: UM ESTUDO DE CASO NA UNIVERSIDADE FEDERAL DO RIO GRANDE

TEORÍA DE LA INTELIGENCIA MÚLTIPLE Y LA FORMACIÓN ACADÉMICA DEL ESTUDIANTE: UN ESTUDIO DE CASO EN LA UNIVERSIDAD FEDERAL DE RÍO GRANDE

Carlos Eduardo Pereira de QUADROS¹
Graciele Lima SAMPAIO²
Diana Francisca ADAMATTI³

ABSTRACT: This article presents an analysis of the application of the canonical correlation on the theory of multiple intelligence (MI) in a group of university students from different areas of knowledge at the Federal University of Rio Grande (FURG). The idea of the research carried out is to find a combination between the students' academic background (chosen area of knowledge) and multiple intelligence. Some variables were analyzed as a way to verify whether there is a direct relationship between MI and the choice of courses or areas, such as gender, academic unit and course semester. From the results obtained, we can conclude that there is a correlation between these variables and MI in the education of undergraduate students from different areas and courses at the University.

KEYWORDS: Multiple intelligences. Higher education. Numerical and statistical analysis of the student.

RESUMO: Este artigo apresenta uma análise de aplicação da correlação canônica sobre a teoria das inteligências múltiplas (IM) em um grupo de estudantes universitários de áreas de conhecimento diversas da Universidade Federal do Rio Grande (FURG). A ideia da pesquisa realizada é encontrar uma combinação entre a formação acadêmica dos estudantes (área de conhecimento escolhida) e as inteligências múltiplas. Algumas variáveis foram analisadas como forma de verificar se existe relação direta entre as IM e a escolha dos cursos ou áreas, como gênero, unidade acadêmica e semestre do curso. Pelos resultados obtidos, podemos

¹ Federal university of Rio Grande (FURG), Campus Carreiros, Rio Grande – RS – Brazil. Center for Computational Sciences – C3. TAE/Informatics and Doctoral Student in the Postgraduate Program in Computational Modeling – PPGMC. ORCID: <https://orcid.org/0000-0002-5755-0586>. E-mail: carlos.quadros@furg.br

² Catholic University of Pelotas (UCPEL), Campus Centro, Pelotas – RS – Brazil. Center for Legal Sciences, Social and Administration. Professor of Higher Teaching. ORCID: <https://orcid.org/0000-0001-6943-6484>. E-mail: graciele_sampaio@yahoo.com.br

³ Federal University of Rio Grande (FURG), Campus Carreiros, Rio Grande – RS – Brazil. Center for Computational Sciences – C3. Professor of Higher Teaching. ORCID: <https://orcid.org/0000-0003-3829-3075>. E-Mail: dianaada@gmail.com

concluir que existe correlação entre estas variáveis e as IM na formação de estudantes de graduação de diversas áreas e cursos na Universidade.

PALAVRAS-CHAVE: *Inteligências múltiplas. Ensino superior. Análise numérica e estatística do discente.*

RESUMEN: *Este artículo presenta un análisis de la aplicación de la correlación canónica sobre la teoría de las inteligencias múltiples (IM) en un grupo de estudiantes universitarios de diferentes áreas del conocimiento de la Universidad Federal de Rio Grande (FURG). La idea de la investigación realizada es encontrar una combinación entre la formación académica de los estudiantes (área de conocimiento elegida) y las inteligencias múltiples. Se analizaron algunas variables como una forma de verificar si existe una relación directa entre la IM y la elección de cursos o áreas, como género, unidad académica y semestre de curso. De los resultados obtenidos se puede concluir que existe una correlación entre estas variables y la IM en la formación de estudiantes de pregrado de diferentes áreas y cursos de la Universidad.*

PALABRAS CLAVE: *Inteligencias multiplex. Enseñanza superior. Análisis numérico y estadístico del alumno.*

Introduction

The Multiple Intelligences theory (MI theory) was created in 1983 by Howard Gardner through his book *Structures of Mind: The Theory of Multiple Intelligences* (GARDNER, 1995). The theory contrasts with the traditional Intelligence Quotient - IQ tests, which assess only two skills: mathematical logic and linguistics. Even with the improvement of IQ tests over the years, the pencil and paper tests are still limited and, to some extent, do not efficiently assess all the abilities of individuals. In the theory proposed by Gardner, seven intelligences were addressed: musical, bodily-kinesthetic, logical-mathematical, linguistic, spatial, interpersonal and intrapersonal. Naturalistic intelligence was introduced years after the other seven. So we currently have eight intelligences in the total pool and a vast field of research to be explored.

Table 1 (ANNEX 3 - Table with the characteristics of multiple intelligences) presents a little of the characteristics of each of the eight intelligences proposed in the theory of MI by Howard Gardner. Since the initial theory of *Structures of Mind: The Theory of Multiple Intelligences* does not address naturalistic intelligence, the work of Ashton and Vernon (2006) has been added to the picture to make the picture complete with the eight intelligences.

Based on Table 1 with the set of eight intelligences proposed by Gardner, we have the possibility to visualize each of the intelligences a little better. It should be noted that we all

have the eight intelligences and they work together. However, some stand out more and others less in each individual (this statement excludes individuals who have had any type of brain damage or for any other reason that their abilities are compromised).

In a contextualized way, just in the field of MI theory with the area of Education, there are countless possibilities of investigation for further research. Thus, this work is justified as an initial step for further research on the understanding of the relationship between the theory of multiple intelligences and the student profile of various courses and areas of knowledge.

This article presents an applied study on the theory of multiple intelligences with a group of university students from different courses, from different areas of knowledge, at the Federal University of Rio Grande. The main motivation of the research is the following hypothesis: is there or is there not a direct relationship between MI theory and the profile of students in different undergraduate courses? And, if there is a relationship, how is it defined in the profile of students, courses and academic units?

Therefore, the main objective of the article is to investigate whether or not there is a correlation between the students' academic background (chosen area of knowledge) and more 'applied' multiple intelligences. In order to achieve the proposed objective, two specific objectives were defined: i) data collection via a questionnaire based on the questions defined by Armstrong (2017); ii) analysis of the data obtained.

Following the text, the adopted work methodology is presented, as well as results and conclusions obtained by the study carried out.

Methodology Adopted

The methodology adopted in this work was divided into the following steps:

1. Assembling the questionnaire on google forms based on the questions defined by Armstrong (2017): this questionnaire has 81 questions, divided among the 8 intelligences. The 81 questions are found in ANNEX 1 - Questionnaire questions sent to respondents; The option to use this questionnaire is due to its consolidation with the scientific community (GONZÁLEZ-TREVIÑO *et al.*, 2020) (MARTINS, 2011).
2. Availability of questionnaires for three distinct academic units of the Federal University of Rio Grande: Center for Computational Sciences (C3), Institute of Economic, Administrative and Accounting Sciences (ICEAC) and Institute of Human Sciences and Information (ICHI). Each of these academic units has undergraduate courses with formation in different areas of knowledge. In C3 the Automation

Engineering, Computer Engineering and Information Systems courses were evaluated. At ICEAC, the courses of Administration, Administration - Santo Antônio da Patrulha, Accounting Sciences, Economic Sciences, Foreign Trade, Technology in Cooperative Management were evaluated. The courses of Archeology, Archival Science, Library Science, Geography (Bachelor and Teaching), History (Bachelor and Teaching), Hospitality, Psychology, Technology in Events and Tourism were evaluated at ICHI. These questionnaires were emailed to regularly enrolled students and were available for responses for 15 days.

3. Organization of the data obtained: the questionnaires were separated by course and academic unit. For each of the 81 questions to be answered, students should mark those that 'identify or perform'. So, the next step was to add up all the positive responses scored by the students for each of the 8 intelligences. For example, for linguistic intelligence, there are 11 questions, where one student may have scored 5 and another 8.
4. Analysis of the data obtained: after having the data of each student, the units were analyzed among themselves and then, in each unit, the courses evaluated. Thus, we can define a correlation between the academic background of students and the area of knowledge chosen in different academic units.
5. For data analysis, the canonical correlation technique was used, through the Statgraphics Centurion software. Canonical correlation, according to Mingoti (2005), seeks to verify the existing linear relationships between two sets of variables. This technique allows comparing several dependent and independent metric variables at the same time, being considered the logical extension of the multiple regression analysis, since it uses only one dependent variable (HAIR JR. *et al.*, 2009). According to Fávero *et al.* (2009), the canonical correlation aims to quantify the strength of the relationship between dependent and independent variables. Canonical correlation, according to Mingoti (2005), synthesizes the sets of response variables into linear combinations and determines that the combinations coefficients are chosen from the maximization of the correlation between the sets of response variables. Thus, linear combinations are the canonical variables and the correlation established between them is the canonical correlation. The canonical correlation seeks to measure the degree of association between the two sets of studied variables; thus, it was possible to verify the existing relationship between Gardner's multiple intelligences and the characteristics of undergraduate students. For this, the model represents the matrices

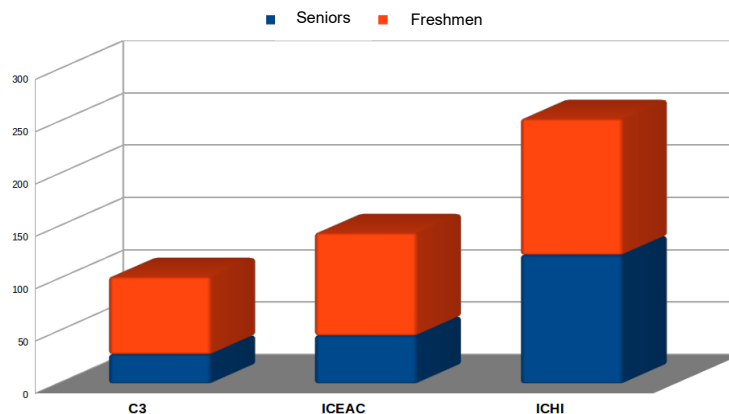
X496x8 and X496x5 (The Statgraphics Centurion software discarded 3 responses automatically), where X represents the 496 undergraduate students of the University as shown in Table 3 and Y the characteristics of the students, gender, course, semester, unit academic and stage (beginner or senior). In this way, the relationship to be established is observed in the equation:

$$a_1X_1+a_2X_2+a_3X_3+\dots+a_mX_m= b_1Y_1+b_2Y_2+b_3Y_3+\dots+b_nY_n$$

Questionnaires were sent to 3,313 students enrolled in the aforementioned courses. Of this total, 499 students responded, 15.06% of the total, which is an expressive number, since surveys without mandatory responses usually have less than 10% of return (VIEIRA; CASTRO SCHUCH JÚNIOR, 2010). The division is presented in ANNEX 2 - Table with the division between the courses - with the total number sent and total answers obtained from students from different academic units.

The profile of the consulted students, in relation to the length of the course and the period they were in, was classified into two types: freshmen and seniors. Thus, students who were at the beginning of their formation, that is, from entering until reaching 50% of the course completion time, were classified as freshmen. And, similarly, the students who were more advanced, that is, from completing 50% of the time in the course until full formation, were classified as seniors, as shown in Figure 1.

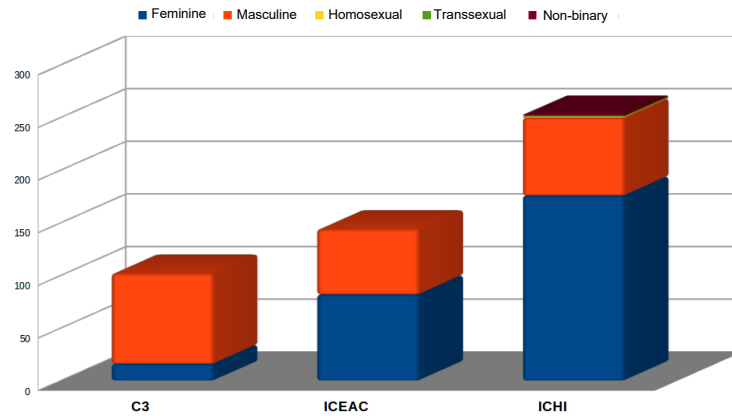
Figure 1- Profile of students consulted in the survey in relation to course time



Source: The authors

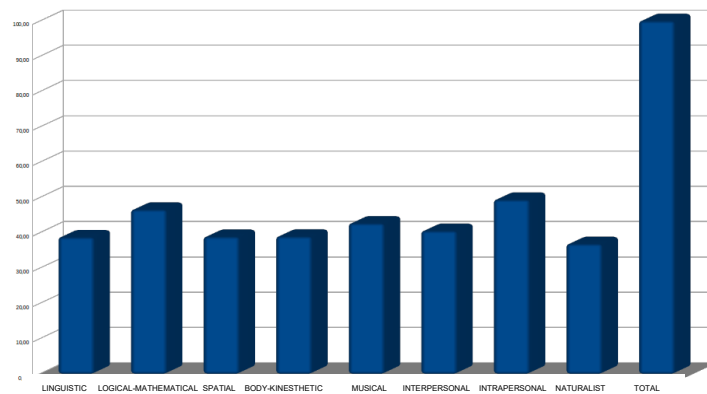
The profile of the consulted students, according to their responses in relation to gender, can be seen in Figure 2.

Figure 2 - Profile of students consulted in the survey in relation to gender



Source: The authors

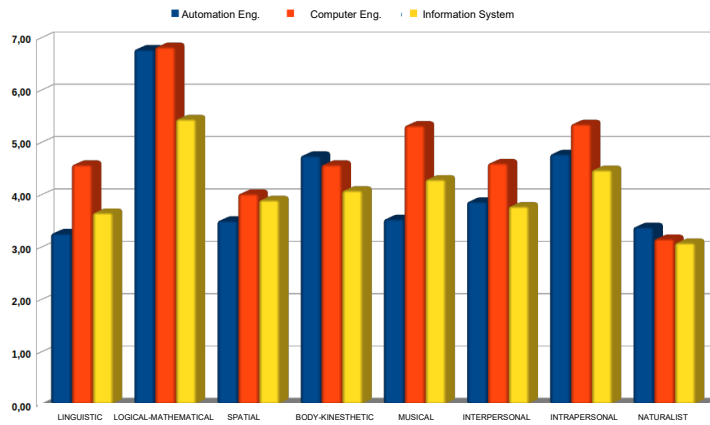
Figure 3 - general intelligences



Source: The authors

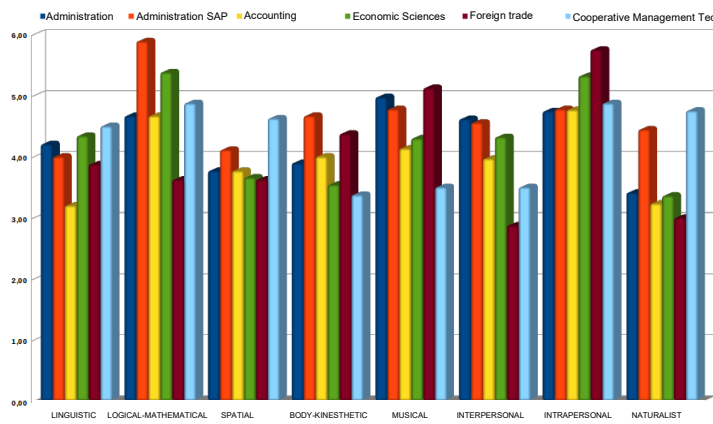
Overall, answers to the 81 questions were returned by 499 students. Of this total, each intelligence had 10 answers that respondents could mark, except the linguistic intelligence which had 11 questions. Figure 3 represents the comparison between the proportionality of responses from each intelligence and the total (represented by the last bar) of possibilities that could be answered. We can see through the graph that, in a general context, none of the intelligences reached 50% of the possible answers.

Figure 4 - Intelligence levels - C3



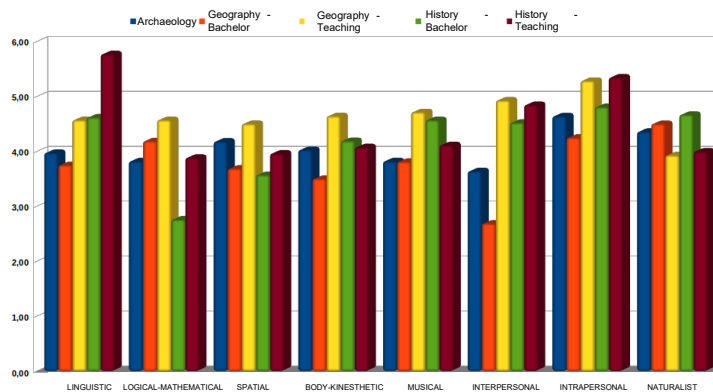
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Figure 5 - Intelligence levels – ICEAC



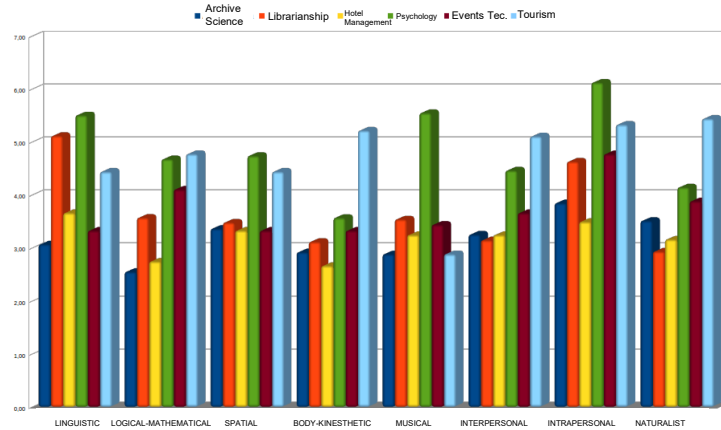
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Figure 6 - Intelligence levels - ICHI 1



Source: The authors

Figure 7 - Intelligence levels - ICHI 2



Source: The authors

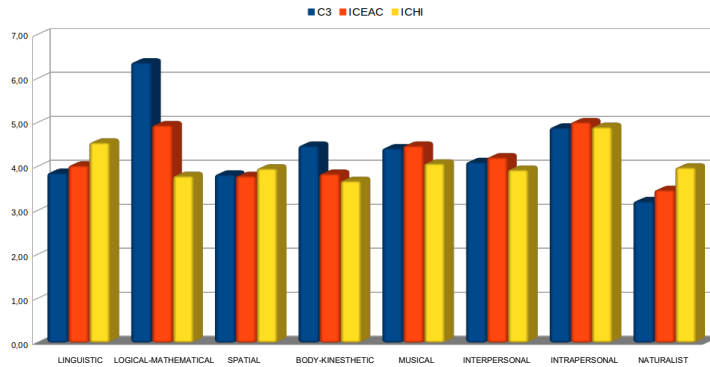
In Figures 4, 5, 6 and 7 the intelligences by academic unit are presented. Since each of the intelligences can have a maximum of 10 positive responses (except the linguistic which allows 11 responses), the values for each academic unit and each course can be verified, respectively. As ICHI's academic unit has many courses, the chart has been divided into two parts.

Results

Analysis of Multiple Intelligences Theory in Units

Figure 8 shows the comparison between the responses of the three units involved in the study. As an example, the total number of responses for linguistic intelligence across all units was 2,125. Among the academic units, these answers had the following values: 394 C3, 580 ICEAC and 1,151 ICHI. Proportionally, the graph shows the total intelligence response quantity divided by the academic unit response quantity. In other words, in the first part of Figure 8, for linguistic intelligence, we have the following values: 3.86 C3, 4.03 ICEAC and 4.55 ICHI.

Figure 8 - MI in academic units



Source: The authors

Table 1 - Proportional values of MI in academic units

Intelligence	C3	ICEAC	ICHI
Linguistic	3.86	4.03	4.55
Logical-Mathematical	6.37	4.94	3.79
Spatial	3.82	3.79	3.96
Body-Kinesthetic	4.48	3.84	3.68
Musical	4.42	4.48	4.08
Interpersonal	4.11	4.22	3.93
Intrapersonal	4.89	5.01	4.91
Naturalist	3.22	3.47	3.98

Source: Research data

Table 1 presents all the proportional values for the MI in the academic units. In bold, some values have been marked, highlighting some of the intelligences in each unit. First, we can highlight the value of Logical-Mathematical intelligence in C3, which is superior to the other two units (6.37). This is justified by being a unit with courses in the area of technology and engineering. In the same unit, the lowest value among all intelligences is also the lowest value among the three units for the naturalistic intelligence (3,22). For intrapersonal intelligence, the ICEAC unit obtained the highest values (5.01), but for this intelligence, the values of the other units were close (4.89 and 4.91), showing that students believe they have self-knowledge. However, for interpersonal intelligence, the values are lower, respectively 4.11, 4.22 and 3.93. In the studies carried out by Pereira and Silva (2017), only with psychology students, the result was exactly the opposite, showing that students had high values for interpersonal intelligence and low values for intrapersonal intelligence.

An important point to emphasize is that the lowest values were found for naturalistic intelligence, showing that education still does not focus on this type of intelligence since elementary school. Sabino and Roque (2006) state that adopting multiple intelligences using different methodologies, considering the individual characteristics of each student, can contribute to the teaching and learning process.

Statistical analysis

To verify, through the canonical correlation, if there is a relationship between multiple intelligences and the characteristics of students, the variables shown in Table 2 were used in the model.

Table 2 – Canonical correlation variables

Variables from set 1	Variables from set 2
linguistic intelligence	Gender Course Academic Units Semester Phase (Freshmen/Senior)
logical-mathematical intelligence	
spatial intelligence	
musical intelligence	
body-kinesthetic intelligence	
interpersonal intelligence	
intrapersonal intelligence	
naturalistic intelligence	

Source: Research data

Canonical correlation demonstrates the linear combinations of two sets of variables that have the highest correlation between them. In this case, 5 sets of linear combinations were formed. In Table 3 it is possible to verify the estimated correlation between each set of canonical variables.

Table 3 – Canonical correlations between multiple intelligences and student characteristics

		Canonical	Wilks	
Canonical Function	Eigenvalue	Correlation	Lambda	P-Value
1	0.242189	0.492127	0.689796	0.0000
2	0.0674388	0.25969	0.910247	0.0179
3	0.0137929	0.117443	0.976072	0.8565
4	0.0060777	0.0779596	0.989724	0.8884
5	0.00422435	0.064995	0.995776	0.7236

Source: Research data

Table 4 presents the linear combinations of the two sets of variables that have the highest correlation between them, in this case, five linear sets were formed. The first set, or canonical function 1, has the greatest explanatory power, 49.21%, according to Hair *et al.* (2009). This correlation is statistically significant at the 95% level, as the p-value was less than 5%.

Table 5 presents the values resulting from the two sets of inputs in the model, which comprises the 499 observations.

Table 4 – Canonical correlation model coefficients

Coefficients of canonical variables of the first set					
Variable	Function 1	Function 2	Function 3	Function 4	Function 5
LI	-0.0933891	-0.506662	-0.867589	0.140496	-0.499162
LMI	0.935395	0.339191	0.238513	-0.0318198	-0.35228
SI	-0.202032	0.362551	0.0857004	0.249524	-0.703386
BKI	0.200578	0.218354	-0.799138	-0.586052	0.547129
MI	0.263066	-0.176053	0.0315061	0.81708	0.693343
ITERI	-0.105814	-0.407857	0.599601	-0.252426	-0.176161
ITRAI	0.0540925	-0.65979	0.400026	-0.345786	0.218749
NI	-0.308176	0.000886401	0.218481	-0.230456	0.131625
Coefficients of canonical variables of the second set					
Variable	Function 1	Function 2	Function 3	Function 4	Function 5
G	0.911059	0.175	0.0940348	0.362305	0.265974

C	0.541779	-1.38017	0.974226	-0.635523	-1.39728
U	-0.590457	0.840045	-0.444838	1.32747	1.62225
S	-0.065338	0.571504	-0.344168	1.08742	-1.21987
F	0.150813	-1.12976	-0.45082	-0.741469	1.04007

Source: Research data

Table 4 shows the estimated correlation between each set of canonical variables. It is noteworthy that the first and second set of canonical variables have statistical significance at the 95% confidence level. Thus, the canonical coefficients corresponding to the first canonical pair show a tendency that, in the first set, the logical-mathematical intelligence variable, 0.935395, had the greatest influence on the model association and the naturalistic intelligence variable, -0.308176 the least influence. In the second set, the gender variable, 0.911059, has the greatest influence on the model association and, in second place, the course variable 0.541779.

When observing the second canonical pair in the first set, the spatial intelligence variable, 0.362551, had the greatest influence on the model association and the intrapersonal intelligence variable, -0.65979, the least influence. In the second set, the academic unit variable, 0.840045, has the greatest influence on the association of the model and in second place, the semester variable 0.571504.

When relating Gardner's multiple intelligences and the characteristics of FURG undergraduate students in function 1, which presented greater explanatory power, it is observed that there is a directly proportional relationship between the variables: logical-mathematical intelligence (LMI), intelligence body-kinesthetic (BKI), musical intelligence (MI), intrapersonal intelligence (ITRAI) and student characteristics by gender (G), course (C) and stage (F) freshman/completing.

Likewise, there is a directly proportional relationship between the variables linguistic intelligence (LI), spatial intelligence (SI), interpersonal intelligence (ITERI), naturalistic intelligence (NI) and the characteristics academic unit (U) and semester (S) that the students belong.

When looking at function 2, which had less explanatory power, it appears that there is a directly proportional relationship between the variables: logical-mathematical intelligence (LMI), spatial intelligence (SI), body-kinesthetic intelligence (BKI), naturalistic intelligence (NI) and student characteristics by gender (G), academic unit (U) and semester (S). There is also a directly proportional relationship between the variables linguistic intelligence (LI),

musical intelligence (MI), interpersonal intelligence (ITERI), intrapersonal intelligence (ITRAI) and the characteristics of course (C) and phase (F) entering/completing.

From these results, it is evident that there is a relationship between multiple intelligences and the characteristics of undergraduate students, with a strength of association considered moderate.

Final considerations

MI theory defends that intelligence cannot be something singular, or that the intelligence of human beings can be measured by only two areas, such as linguistics and logical-mathematics. MI theory has a set of eight intelligences, which are: linguistic (words and symbols), Logical-mathematical (calculations and problems), musical (production and understanding of sounds), body-kinesthetic (body control and expression), spatial (perception of space, dimension and orientation), naturalist (recognition and classification of what is related to nature), interpersonal (empathy and understanding of other people's feelings), intrapersonal (understanding oneself).

According to Travassos (2001), the best way to understand each intelligence is conceiving them as interrelated, with the possibility of different intellectual profiles in different groups. For a deeper understanding of MI theory, there are numerous studies and different approaches, both for the set of eight MI, and for the study of each of the intelligences in a specific way. Thus, in this work, we sought to find aspects that would correlate intelligence among students from different FURG undergraduate courses, in different areas of knowledge. Thus, trying to define whether there was a relationship between multiple intelligences and their formation. Here, it was also interested to know how much training itself can expand multiple intelligences, in the case of beginners and graduates of the course.

Therefore, we first present the adopted methodology and a profile of the students who participated in the questionnaire. Then, the numerical results are presented, highlighting the data in Table 2, and the emphasis of each unit and its most heavily studied areas of knowledge. In the statistical analysis, it was possible to define and correlate the eight multiple intelligences with the variables gender, course, academic units, semester and phase (freshmen/senior), which are presented in Tables 4 and 5, showing how these variables have a 'weight' on each of the intelligences. It is worth highlighting the values of gender in function 1 and of unit in function 2. However, in order to be able to state more precisely about these aspects, it will still be necessary to carry out more studies, but it is clear that there are

differences between the areas of knowledge and the students who choose them for their formation.

As a continuation of this research, we envisage carrying out more statistical tests on the data, as well as carrying out a new round of questionnaires with the group of previously participating students, in order to analyze changes in their education over time and outside the context of the COVID-19 pandemic, a fact that may interfere in the students' responses.

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ANNEX 1

Questionnaire questions sent to respondents

Linguistic intelligence

- 01 - Books are very important to me.
- 02 - I hear the words in my head before reading, speaking or writing them.
- 03 - I enjoy (learn) more listening to the radio or recording readings than watching television or movies.
- 04 - I like crossword puzzles, anagrams or passwords.
- 05 - I like to entertain myself and entertain others with tongue twisters, puns or non-sense rhymes.
- 06 - People sometimes ask me to stop and explain the meaning of the words I use when I write or speak.
- 07 - Portuguese, social studies and history were easier subjects for me at school than math and science.
- 08 - Learning another language (e.g., French, English, Spanish and German) was relatively easy for me.
- 09 - When I drive on a highway, I pay more attention to the words written on signs or advertisements than to the landscape.
- 10 - My dialogues often include references to things I read or heard.
- 11 - I recently wrote something that made me especially proud or was recognized by others.

Logical-Mathematical Intelligence

- 12 - I find it easy to do calculations in my head.
- 13 - Mathematics and/or science were among my favorite subjects at school.
- 14 - I like games or puzzles that require logical thinking.
- 15 - I like to do little “what if” experiments (for example: “What if I doubled the amount of water I put in my rosebush weekly?”).
- 16 - My mind looks for patterns, regularities or logical sequences in things.
- 17 - I am interested in the progress of science.
- 18 - I believe that almost everything has a rational explanation.
- 19 - Sometimes I think of clear, abstract, non-verbal and imageless concepts.
- 20 - I like to detect logical flaws in the things people say and do at home and at work.
- 21 - I feel more comfortable when something has been measured, categorized, analyzed or quantified in some way.

Spatial intelligence

- 22 - When I close my eyes, I often see clear images.
- 23 - I'm sensitive to color.
- 24 - I often use a camera or a camcorder to record what I see around me.
- 25 - I like to assemble puzzles, mazes and other visual games.
- 26 - I have clear dreams at night.
- 27 - I can usually find my way in unfamiliar places.
- 28 - I like to draw or doodle.
- 29 - Geometry was easier for me than algebra when I was in school.
- 30 - I can easily imagine what a thing would look like if we viewed it from above, panoramically.
- 31 - I prefer to read materials with many illustrations.

Body-Kinesthetic Intelligence

- 32 - I practice at least one sport or physical activity regularly.
- 33 - I have difficulty staying quiet for long periods of time.
- 34 - I like to work with my hands in concrete activities such as sewing, knitting, carving, carpentry work or modeling.
- 35 - My best ideas come to me when I go for a long walk, to run or when I am involved in some other type of physical activity.
- 36 - In general, I like to spend my leisure time outdoors.
- 37 - I often gesture or use other forms of body language when talking to people.
- 38 - I need to touch things to learn more about them.
- 39 - I enjoy challenging or thrilling fun, electrifying physical experiences.
- 40 - I would describe myself as having good motor coordination.
- 41 - I need to practice a new skill instead of reading about it or seeing a movie that describes it.

Musical Intelligence

- 42 - I have a nice voice when I sing.
- 43 - I notice when a musical note is out of tune.
- 44 - I often listen to music on the radio, on recordings, records or CDs.
- 45 - I play a musical instrument.
- 46 - My life would be poorer if there were no music in it.
- 47 - Sometimes I find myself walking down the street with a television jingle or music in my head.
- 48 - I can easily mark the rhythm of a song with a simple percussion instrument.
- 49 - I know the melodies of many different songs.
- 50 - If I hear a musical selection once or twice, I'm usually able to repeat it with reasonable accuracy.
- 51 - I'm often drumming or singing melodies while I'm working, studying or learning something new.

interpersonal intelligence

- 52 - I'm the kind of person that others turn to for advice, at work or in the neighborhood.
- 53 - I prefer team sports such as shuttlecock, tennis, volleyball or baseball to individual sports such as swimming or running.
- 54 - When I have a problem, I prefer to look for a person to help me, instead of trying to solve it myself.
- 55 - I have at least three close friends.
- 56 - I prefer collective hobbies, like tabletop games or canasta, to individual recreations like video games or solo card games.
- 57 - I like the challenge of teaching another person, or group of people, the challenge of doing things I know how to do.
- 58 - I consider myself a leader (or people consider me that way).
- 59 - I feel comfortable in a crowd.
- 60 - I like to participate in social activities related to my work, church or community.
- 61 - I'd rather spend my nights at a lively party than stay home alone.

Naturalistic intelligence

- 62 - I like to go around with a backpack on my back, camping or simply walking and observing nature.

63 - I am part of a volunteer organization related to nature and I want to help save the environment from the destruction it is suffering.

64 - I like having pets.

65 - I have a hobby related to nature (for example: bird watching).

66 - I like to study subjects related to nature (for example: botany, zoology).

67 - I find it easy to see the differences between different types of trees, dogs, birds or other types of fauna and flora.

68 - I like to read magazines and books or watch television programs or movies about nature.

69 - I prefer to spend my vacations in natural environments such as a beach or camping with ecological trails than in urban or cultural places such as a hotel within a city.

70 - I love visiting zoos, aquariums and other places where we can study the natural world.

71 - I have a garden in my house and I love taking care of it.

Intrapersonal Intelligence

72 - I usually spend time alone meditating, reflecting or thinking about important issues in life.

73 - I've attended orientation sessions or personal growth seminars to learn more about myself.

74 - I am able to react to difficulties with courage.

75 - I have a hobby or special interest that I keep to myself.

76 - I have some important goals in my life that I regularly reflect on.

77 - I have a realistic view of my strengths and weaknesses (based on data from other sources/people).

78 - I'd rather spend a weekend alone in a cabin in the woods than in a fancy hotel full of people.

79 - I consider myself a determined person, with my own ideas.

80 - I keep a personal diary to record what goes on in my inner life.

81 - I am a self-employed professional or at least I have thought a lot about starting my own business.

ANNEX 2

Table with the division between courses - with total sent and total responses obtained

Unit	Course	Total Sent	Total Answered	
C3	Automation Engineering	169	33	
	Computer engineering	224	36	
	Information systems	144	33	
ICEAC	Administration	432	39	
	Administration- Santo Antônio da Patrulha	87	9	
	Accounting Sciences	410	30	
	Economic Sciences	381	50	
	Foreign trade	100	8	
	Cooperative Management Technology	39	8	
	Archeology	123	39	
ICHI	Archival science	155	27	
	Librarianship	147	33	
	Geography - Bachelor	118	16	
	Geography - Teaching	112	14	
	History - Bachelor	124	21	
	History - Teaching	126	26	
	Hotel Management	89	12	
	Psychology	185	47	
	Technology in Events	78	9	
	Tourism	70	9	
	TOTAL		3.313	499

ANNEX 3

Table with the characteristics of multiple intelligences

Musical	Certain parts of the brain play important roles in the perception and production of music. These areas are characteristically located in the right hemisphere, although musical ability is not clearly located in an area as specific as language.
Body-kinesthetic	Control of body movement is located in the motor cortex with each dominant hemisphere of body movement on the contralateral side.
Logical-Mathematical	It is the archetype of 'Pure Intelligence' or the ability to solve problems that significantly shortens the path between domains. Certain areas of the brain are more important than others in mathematical calculation. There are individuals with savant syndrome who perform great feats of calculation.
Linguistics	The so-called 'Broca center' is responsible for the production of grammatical sentences. A person with damage in this area can understand words and phrases quite well, but has difficulty putting words together into more than simple sentences.
Spatial	Just as the left hemisphere, over the course of evolution, was chosen as the site of linguistic processing in right-handed people, the right hemisphere is arguably the most crucial site of spatial processing.
Interpersonal	It is based on a core ability to perceive distinctions among others; in particular, contrasts in their moods, temperaments, motivations, and intentions.
Intrapersonal	It works on the knowledge of a person's internal aspects: access to the feeling of one's own life, the range of one's emotions, the ability to discriminate these emotions and eventually label and use them as a way to understand and guide one's behavior.
Naturalist	A naturalist is someone capable of recognizing and classifying objects. Hunters, farmers, and gardeners would have naturalistic intelligence, as would artists, poets, and social scientists adept at pattern recognition.

Source: Gardner (1995) and Visser, Ashton and Vernon (2006)