

ARTIGO

**SELF-ASSESSMENT OF GENERIC COMPETENCES IN GRADUATES OF A BRAZILIAN  
INTERDISCIPLINARY BACHELOR'S DEGREE**

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**ABSTRACT:** Professional competences represent a combination of attributes (knowledge, skills, and attitudes) that describe to how extent the person may perform them. In general, the professional competences are classified as specific (directly related to the professional activities), and generic (interchangeable with multiple life functions and tasks). This paper analyses the development of generic competences by graduate students of Interdisciplinary Baccalaureate in Sea Science, at the Universidade Federal de São Paulo. One hundred and eighty graduating between 2015 and 2018 answered an online survey. Among the 19 generic self-valued competences, Ability to work as a team and Ethical commitment got the highest scores. Motivation for work, Ability to apply knowledge to practice, and Motivation to achieve goals got the lowest scores. The alumni who were working pointed out that Ethical commitment, Responsibility at work, and Teamwork as the most relevant competences for the labor market. Basic knowledge of the profession, Ability to apply knowledge to practice, and Motivation for work were valued as less important. There were discrepancies in the competences scores attributed to development along the university course and demanded by the labor market. Such discrepancies indicate

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a mismatch between the competence development at the university and the request of the professional market.

**Keywords:** Generic competences, graduate, interdisciplinary undergraduate course, sea science and technology, employability.

### **AUTOVALORAÇÃO DE COMPETÊNCIAS GENÉRICAS EM EGRESSOS DE UM BACHARELADO INTERDISCIPLINAR BRASILEIRO**

**RESUMO:** As competências profissionais representam uma combinação de atributos (conhecimentos, habilidades e atitudes) que descrevem o grau em que a pessoa é capaz de desempenhá-los, podendo ser classificadas como: específicas (relacionadas diretamente com a profissão), e genéricas (transferíveis a múltiplas funções e tarefas). O estudo apresenta autoavaliações de competências genéricas feitas por egressos do Bacharelado Interdisciplinar em Ciência e Tecnologia do Mar, da Universidade Federal de São Paulo. Participaram da pesquisa 180 egressos formados de 2015 a 2018. Das 19 competências genéricas autovaloradas com maior desenvolvimento durante o curso, destacam-se Capacidade de trabalhar em equipe e Compromisso ético. Motivação para o trabalho, Capacidade de aplicar os conhecimentos à prática e Motivação para alcançar metas foram as menos valoradas. Para os egressos que estavam trabalhando, as competências tidas como mais importantes para o trabalho foram: Compromisso ético, Responsabilidade no trabalho e Capacidade de trabalhar em equipe. Conhecimentos básicos da profissão, Capacidade de aplicar os conhecimentos à prática e Motivação para o trabalho foram valoradas como menos importantes. Houve discrepâncias na valoração de competências entre o desenvolvido no curso e o praticado no trabalho, apontando um descompasso entre o desenvolvimento dessas competências na Universidade e o que é demandado no mercado profissional.

**Palavras-chave:** Competências genéricas, egressos, bacharelado interdisciplinar, ciência e tecnologia do mar, empregabilidade.

### **AUTOEVALUACIÓN DE HABILIDADES GENÉRICAS EN GRADUADOS DE UNA LICENCIATURA INTERDISCIPLINARIA BRASILEÑA**

**RESÚMEN:** Las habilidades profesionales representan una combinación de atributos (conocimientos, habilidades y actitudes) que describen el grado en que la persona puede realizarlas, que se pueden clasificar en: específicas (directamente relacionadas con la profesión) y genéricas (transferibles a múltiples funciones y tareas). El estudio presenta autoevaluaciones de habilidades genéricas realizadas por graduados de la Licenciatura Interdisciplinaria en Ciencias y Tecnología del Mar, de la Universidade Federal de São Paulo. Participaron en la investigación 180 egresados entre 2015 y 2018. De las 19 habilidades genéricas auto valoradas con un mayor desarrollo durante el curso, se destacan la capacidad de trabajar en equipo y el compromiso ético. La motivación para el trabajo, la capacidad de aplicar el conocimiento a la práctica y la motivación para lograr los objetivos fueron las menos valoradas. Para los graduados que estaban trabajando, las habilidades consideradas más importantes para el trabajo fueron: compromiso ético, responsabilidad en el trabajo y capacidad para trabajar en equipo. El conocimiento básico de la profesión, la capacidad de aplicar el conocimiento a la práctica y la motivación para el trabajo se valoraron como menos importantes. Hubo discrepancias en la valoración de las habilidades entre lo que se desarrolló en el curso y lo que se practicó en el trabajo, lo que indica un desajuste entre el desarrollo de estas habilidades en la Universidad y lo que se requiere en el mercado profesional.

**Palabras clave:** Habilidades genéricas, graduados bachillerato interdisciplinario, ciencia y tecnología del mar, empleabilidad.

## INTRODUCTION

As a central and constituent aspect of human life, work changes as society is transformed because work and society are in intrinsic and continuous interaction. For Klaus Schwab (2016), we are currently experiencing the Fourth Industrial Revolution (4IR). 4IR has been around since the turn of the century and is the result of the integration and composition of technologies such as artificial intelligence, biotechnology, and the use of nanomaterials (Penprase, 2018; Schwab, 2016). In this scenario, rapid interactions with interdisciplinary fields of study emerged, in which new skills and knowledge became of great importance such as adaptability, the ability to learn and think alone (autonomously), and teamwork (Penprase, 2018; Xing). & Marwala, 2017). According to Chui et al. (2016), this knowledge and skills cannot yet be replaced by machines - and therefore they become valuable in the current context.

In 1998, to promote a more effective adjustment between educational training and the new demands of the world of work (in search of better resources for socioeconomic development), the United Nations Educational, Scientific and Cultural Organization (Unesco) held the “World Conference on Higher Education”, discussing the topic of general competences to be acquired in higher education, considered as key competences for the qualification of university students. These competencies would include social and communication skills, teamwork, creativity, handling cultural diversity, and the ability to assume responsibility and risk. They could help in personal development, citizenship, social inclusion, and insertion in the labor market (Cheetam & Chivers, 2000; Jones, 1996). In this way, the importance is given to the concept of “employability-related competences” or “generic competences” was increased, such as those associated with knowledge management, leadership, problem-solving ability, and work motivation – the same that was already being studied and taken into account in some countries (Fleury, 2002; Freire Seoane & Salcines Cristal, 2010; McClelland, 1973).

The privileged mention of the connection with competences in the sphere of university education was already present since the 1970s, in France, with the emergence of the competence inventory, the *bilan de compétences* (Fleury, 2002), associated with a “know how to act” between education and work, diploma and job. At the same time, in the United States of America (USA) the article by McClelland (1973) entitled *Testing for Competence rather than for Intelligence* was published, in which the term competence was used to designate behavior for the performance of a certain task. Two decades later, Prahalad and Hamel (1990) published *The core competence of the corporation*, at Harvard, stating that competence was essentially the ability to combine, mix and integrate resources into products/services in the market.

However, generic competences also competed and still compete for space with other concepts and classifications, with slight differences - based on what would be their objectives and their operating logic (Beneitone & Bartolomé, 2014; Braun & Brachem, 2015; Stenic & Adam, 2017; Van der Klink & Boon, 2003). As an example of the different conceptualizations, Van der Klink and Boon (2003) cite the use of different words to name and conceptualize “competence”: in the USA the term *competency* was used to denominate competences, which referred to a set of skills for great performance; in the UK the word *competence* was used for collectively accepted performance standards; and in Germany, *kompetenz* referred to an individual's ability to perform various tasks in their profession, in different work contexts.

In Europe, faced with the need to increase the employability of graduates, standardize curricula between countries (allowing academic exchange), and strengthen the competitiveness and attractiveness of European undergraduate and graduate courses (Bologna Beyond 2010, 2009), the European Union has promoted major transformations in higher education in the last three decades. The Bologna Declaration, signed by 29 countries in 1999, marked the beginning of these transformations when signatories agreed to create a common vision for higher education (The Bologna Process Revisited, 2015). From then on, the European Higher Education Area emerged, which, in 2015, had 48 member countries, and is currently based on a common structure (which includes a credit system, principles for the development of student-centered teaching, methodologies, and sustainable goals) and the same assessment tools (The Bologna Process Revisited, 2015).

In this European context, the development of student-centered teaching should be based on the development of generic professional competences, those that can be transferred to other areas

and that facilitate academic exchange (The Bologna Process Revisited, 2015; Palmer Pol et al., 2009). Also, in Europe, to understand which competences would be interesting to include in course programs, the Tuning Europe Project was created, which defined and mapped, in its first phase, the generic competences required by employers, academics, and students (Beneitone & Yarosh, 2015; Gonzales & Wagenaar, 2003; Wagenaar, 2014). Expanding European borders, the Tuning Project also evaluated competences in other regions of the planet such as Russia, Latin America, and Africa (Beneitone & Bartolomé, 2014).

Given the diversity of concepts and definitions, Van der Klink et al. (2007) suggest that, when dealing with competences, we should clarify which concept will be used. Therefore, because of the instrument that will be mobilized in this research, which is derived directly from the Tuning Project, the conceptualization and classification of competence will also be aligned the context developed for that reason, understood as the integration between knowledge and understanding (theoretical knowledge of a topic and the ability to know and understand) and knowledge how to be (based on values for living with and perceiving others, in a social context) (González & Wagenaar, 2003). Competences represent a combination of attributes (such as knowledge and its applications, attitudes, skills, and responsibilities) that describe the level or degree that a person can perform them (González & Wagenaar, 2003). Professional competences can be further classified into “generic”, which are transferable to multiple functions and tasks, and “specific”, which are those directly related to the profession (Freire Seoane et al., 2013).

Therefore, from the point of view of the Bologna Process, the employability of graduates is directly related to the skills they must develop to become competitive and adapt to changes in contemporary work. Professionals trained in the student-centered model would be “more competent”, better adapted to the needs of the current job market, and, therefore, more valuable to their employer, increasing their employability potential (Kallioinen, 2010).

Also, for authors who study the 4IR, the acquisition and development of competences are necessary to adapt to the new work model (Aires et al., 2017; Gleason, 2018; Penprase, 2018). As highlighted by Penprase (2018), changes in society and the impacts of technology on Education take time to be fully performed, but they are necessary for adaptation to the new existing models. The task of universities becomes more permeable to social needs and the world of work, offering students opportunities for the development of generic competences (Palmer Pol et al., 2009). The interaction between universities (that teach) and companies (that employ and put into practice) must happen so that the employability of graduates increases, taking into account the reality of the working world (Freire Seoane et al., 2013; Gleason, 2018; Van der Klink et al., 2007).

Focusing on the Brazilian educational reality for higher education, the Law of Directives and Bases for National Education (Law nº 9.394, 1996) was promulgated in the 1970s, which established general guidelines for the elaboration of curricula for undergraduate courses in higher education. The proposal was to combine curricula with the world of work, making them more flexible as opposed to previous models, those of the so-called minimum curricula. In this way, discussions about the education of professional profiles started to be inserted in the scope of debates on undergraduate curricula. Ideas such as flexibility and dynamism in the curricular organization, adaptation to the demands of the job market, integration between undergraduate and graduate courses, emphasis on general education, and the definition and development of general competencies and skills, have become references of principles for undergraduate curricula.

In the 1990s, the Ministry of Education of Brazil (MEC- *Ministério da Educação*) started to implement some curricular changes, justified by the transformations from globalization and the growing technological advance that impacted the job market. At the time, the training students for specific traditional qualifications was considered not enough, but an advance in the training process focused on the acquisition and development of skills and knowledge required by the job market for professionals, including skills to use new technologies and the use of new modalities of communication (Secretaria de Educação Fundamental, 1997). In 2015, article 7 of Resolution 2, of the National Education Council (CNE) of Brazil (Resolution CNE 2, 2015) set objectives and goals for higher education, and granted greater autonomy to Higher Education Institutions for the elaboration of the curricula of its courses

based on competences and abilities to be developed, using a pedagogical model that would adapt to the demands of society.

Because of the above, we present a study aimed at the self-evaluation of generic competences in graduates of an interdisciplinary bachelor's degree (BI- *bacharelado interdisciplinar*) from a Brazilian public university, the Interdisciplinary Baccalaureate in Sea Science (BICT Mar- *Bacharelado Interdisciplinar em Ciência e Tecnologia do Mar*) from the Universidade Federal de São Paulo. (Unifesp), regarding the level of development of these competences during the course and their level of importance for the daily work of the graduates.

## METHOD

### Participants

The research participants were graduates from 2015 to 2018 from BICT Mar of Unifesp, a Brazilian public university with a campus located in the Metropolitan Region of Baixada Santista (RMBS), which covers nine municipalities. Among the economic activities in the RMBS, we highlight service provision activities with strong interaction with port activities (due to the presence of the Port of Santos, the largest port in Latin America), tourism based on its long coastline, and the areas of marine and coastal environmental protection (Rede urbana e regionalização do Estado de São Paulo, 2011).

The BIs courses, regulated from the Program of Support to Restructuring and Expansion Plans of Federal Universities (Reuni) implemented by MEC in 2007, followed the ideals of Universidade Nova (Teixeira, 2005), which advocates interdisciplinary and integral training opposed to the compartmentalized format of European schools at the end of the 19<sup>th</sup> century. The BI aims to train graduates able to work in the public and private sectors and also in the third sector (non-governmental bodies). The interdisciplinary characteristic of the courses is present in the articulation and interrelation between the curricular units and areas of knowledge, as recommended in the guiding references of the MEC (Opinion CNE/CES n° 266, 2011). It is expected that professionals with a Bachelor's degree in interdisciplinary training have an autonomous view of their learning, through the development of theoretical and practical competences, both specific and generic, for better insertion in the job market and better personal development.

### Instrument

For the evaluation of generic competences, we used the Scale of Generic Competences for Graduates (SGCG), a seven-point Likert-type scale, composed of 19 competences. For each competence, the respondents should assess how much it was developed in their undergraduate course and also the importance of the performance of their professional activities. The same scale was used by Freire Seoane et al. (2013) at the University of Coruña (Spain).

### Procedures

The research reported in this article was approved by the Research Ethics Committee of Unifesp (opinion 3,588,535). The research used information from a database collected online (using SGCG, among other instruments) to assess the perception of the experience in the course and the job placement of graduates. Data collection was conducted by the course coordinator between August and October 2019. Graduates were contacted by email and telephone and invited to respond to the online questionnaire. This research had access to data on age, gender, work, academic insertion, and the generic competences (SGCG) of the graduates.

The graduates' answers regarding generic competences were evaluated by descriptive statistical analysis, considering two perspectives: 1) level of development of each competence during the course (averages for each competence, calculated for all respondents); 2) importance of each competence in the professional activities developed by the graduates working in the job market. All graduates were invited to participate in data collection in perspective 1, and only graduates working in the labor market participated in data collection in perspective 2.



The study also evaluated the difference between the level of development achieved at graduation (perspective 1) and the importance for work (perspective 2), for each competence, which we will call “Graduation-Professional discrepancy”. For this variable, we present average values, considering only graduates working in the labor market.

## RESULTS

The sample consisted of 180 participants (which corresponded to 60.8% of the total number of graduates from BICT Mar), 74 men (41.1%), and 106 women (58.9%). The mean age of the participants was 24.8 years, ranging from 21 to 44 years, with 71.7% of the participants being up to 25 years old. Regarding the work and academic situation of the graduates (Table 1, Figure 1), 92.8% did not have a previous degree (which was their first degree), 53.9% were not working and 76.7% were continuing their studies (second cycle of higher education, offered by the same University, or a graduate course such as a master's degree, specialization, among others).

**Table 1**

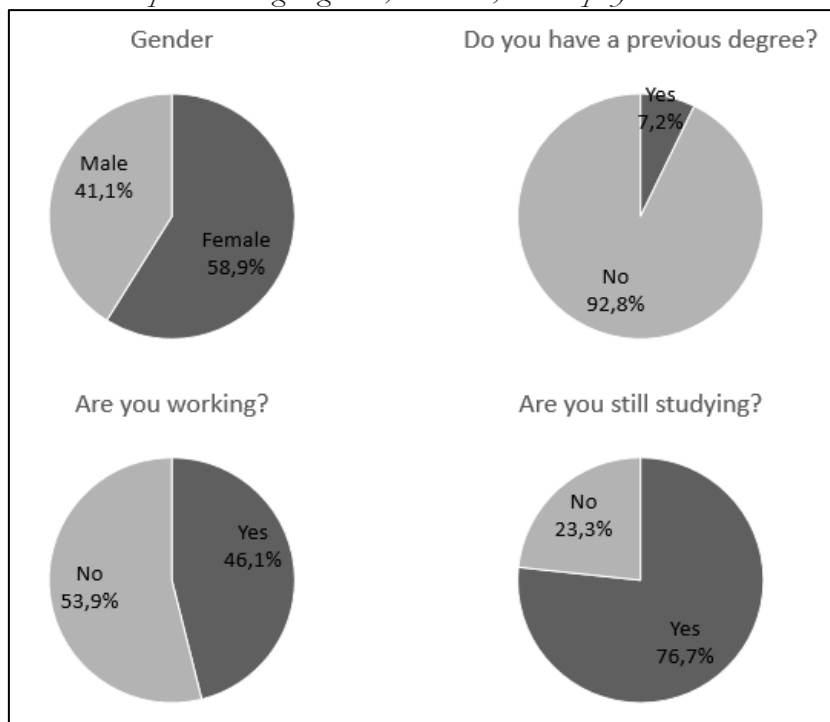
*Work and academic status of graduates*

		Frequency	Percentage
<b>Do you have a previous degree?</b>	Yes	13	7.2
	No	167	92.8
<b>Are you working?</b>	Yes	83	46.1
	No	97	53.9
<b>Are you still studying?</b>	Yes	138	76.7
	No	42	23.3

*Note.* Author's elaboration.

**Figure 1**

*Sample according to gender, academic, and employment status*



*Note.* Author's elaboration.

In their evaluation of the quality of training received at the University (Table 2, Figure 2), 51.7% of the graduates considered it “adequate”, followed by 31.1% who considered it “very or extremely adequate”. Regarding the employability potential of the graduate, most of those surveyed (70%) rated it as “very low” (33.3%) or “low” (36.7%).

**Table 2**

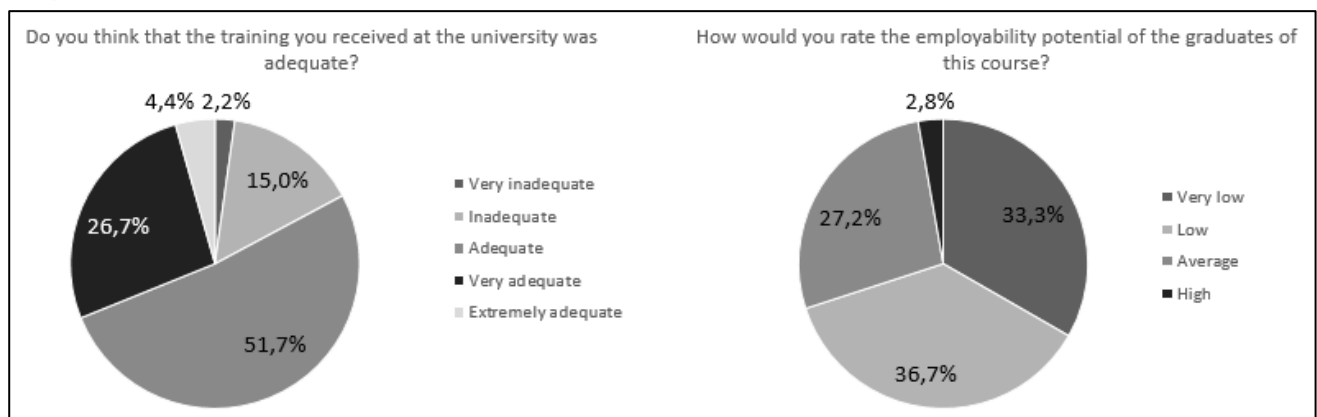
*Evaluation of training at the University*

		Frequency	Percentage
<b>Do you think that the training you received at the university was adequate?</b>	Very inadequate	4	2.2
	Inadequate	27	15.0
	Adequate	93	51.7
	Very adequate	48	26.7
	Extremely adequate	8	4.4
<b>How would you rate the employability potential of the graduates of this course?</b>	Very low	60	33.3
	Low	66	36.7
	Average	49	27.2
	High	5	2.8

*Note.* Author’s elaboration.

**Figure 2**

*Sample according to the evaluation of the training received*



*Note.* Author’s elaboration.

Table 3 shows the results of the level of development of the 19 generic competences throughout the undergraduate course at BICT Mar. The competences that presented the highest average values were C5 (Ability to work as a team; average = 5.84), C8 (Ability to learn; mean = 5.83), and C6 (Ethical commitment; mean = 5.79). The lowest averages, increasingly, were for C9 (Motivation for work; average = 3.93); C11 (Ability to apply knowledge to practice; mean = 4.09), and C12 (Motivation to achieve goals; mean = 4.27).

**Table 3***Results of generic competences according to the level of development in the course for the entire sample*

Acronym	Competence	Average	Standard-Deviation
C5	Ability to work as a team	5.84	1.37
C8	Ability to learn	5.83	1.33
C6	Ethical commitment	5.79	1.52
C16	Ability to analyze and synthesize	5.63	1.35
C2	Communication ability	5.63	1.33
C13	Ability to adapt to new situations	5.59	1.56
C17	Interpersonal abilities	5.35	1.53
C10	Concern about quality and improvement	5.32	1.58
C7	Responsibility at work	5.32	1.71
C3	Problem-solving	5.28	1.31
C19	Ability to generate new ideas	5.21	1.52
C18	Ability to work independently	5.19	1.62
C14	Decision-making	5.12	1.59
C4	Ability to organize and plan	5.04	1.60
C15	Information management abilities	4.89	1.67
C1	Basic knowledge of the profession	4.44	1.76
C12	Motivation to achieve goals	4.27	1.78
C11	Ability to apply knowledge to practice	4.09	1.72
C9	Motivation for work	3.93	1.84

*Note.* Author's elaboration.

Table 4, Figures 3 and 4 show the average results of the levels of development at BICT Mar, the importance of competences for carrying out their activities at work, and the Graduation-Professional discrepancy. For these results, we only considered participants who reported being in some work occupation ( $n = 83$ ). Regarding the importance for work, the competences indicated as most important, in decreasing order, were C6 (Ethical commitment; average = 6.23), C7 (Responsibility at work; average = 6.23), and C5 (Ability to work as a team; mean = 6.14). The least important competences, increasingly, were C1 (Basic knowledge of the profession; average = 3.75), C11 (Ability to apply knowledge to practice; average = 5.04), and C9 (Motivation for work; average = 5.27).

The Graduation-Professional discrepancy index showed negative intervals for most competences (17 out of 19), pointing to the development of competences at graduation that is lower than their importance in the job market. Among these competences, the biggest discrepancies were for C12 (Motivation to achieve goals; average = -1.4), C9 (Motivation for work; average = -1.11), and C11 (Ability to apply knowledge to practice; average = -1). The smallest discrepancies and the only positive values in the sample were for C1 (Basic knowledge of the profession; mean = 0.67) and C16 (Ability to analyze and synthesize; mean = 0.05). These results indicate that the competences C1 and C16 developed during graduation met the demand that the graduates reported finding for the daily routine of their professional activities. Chart 1 summarized the main research results.



**Table 4**

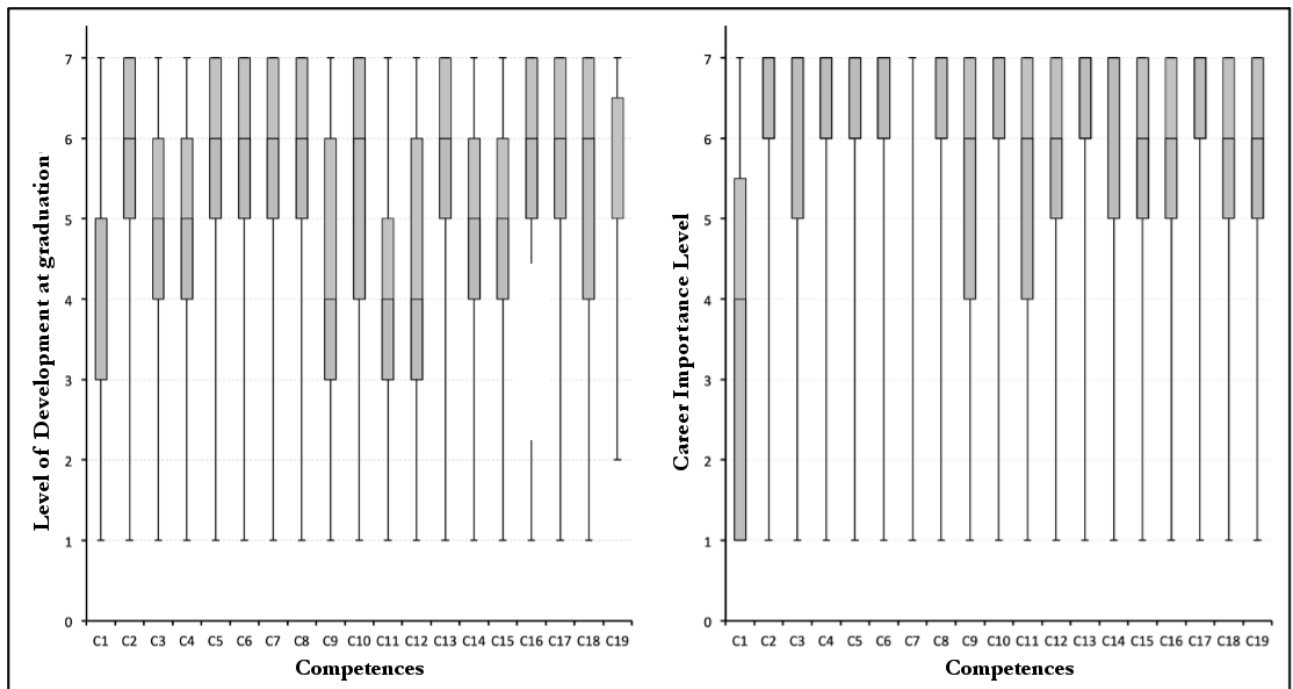
*Results of generic competences according to the level of development during the course, importance for work, and the Graduation-Professional discrepancy, for graduates who are working*

Acronym	Development		Importance		Graduation-Professional Discrepancy	
	Mean	SD	Mean	SD	Mean	SD
C12	4.28	1.78	5.59	1.75	-1.4	2.17
C9	3.93	1.84	5.27	2.12	-1.11	2.32
C11	4.09	1.73	5.04	2.17	-1	2.22
C4	5.05	1.6	5.98	1.62	-0.93	1.81
C7	5.32	1.71	6.23	1.76	-0.88	1.92
C15	4.91	1.66	5.65	1.80	-0.76	1.85
C3	5.28	1.31	6.01	1.49	-0.69	1.58
C14	5.13	1.58	5.84	1.64	-0.66	1.76
C10	5.33	1.58	5.89	1.79	-0.59	2.04
C17	5.36	1.53	6.04	1.54	-0.48	1.71
C6	5.79	1.52	6.23	1.62	-0.36	1.66
C2	5.64	1.33	6.12	1.49	-0.35	1.37
C13	5.59	1.57	6.01	1.64	-0.28	1.69
C18	5.2	1.6	5.48	1.88	-0.25	1.67
C19	5.2	1.5	5.6	1.72	-0.24	1.69
C5	5.85	1.36	6.14	1.61	-0.18	1.51
C8	5.84	1.33	6.13	1.62	-0.16	1.67
C16	5.64	1.34	5.64	1.89	0.05	1.82
C1	4.44	1.76	3.75	2.20	0.67	2.22

*Note.* Author’s elaboration.

**Figure 3**

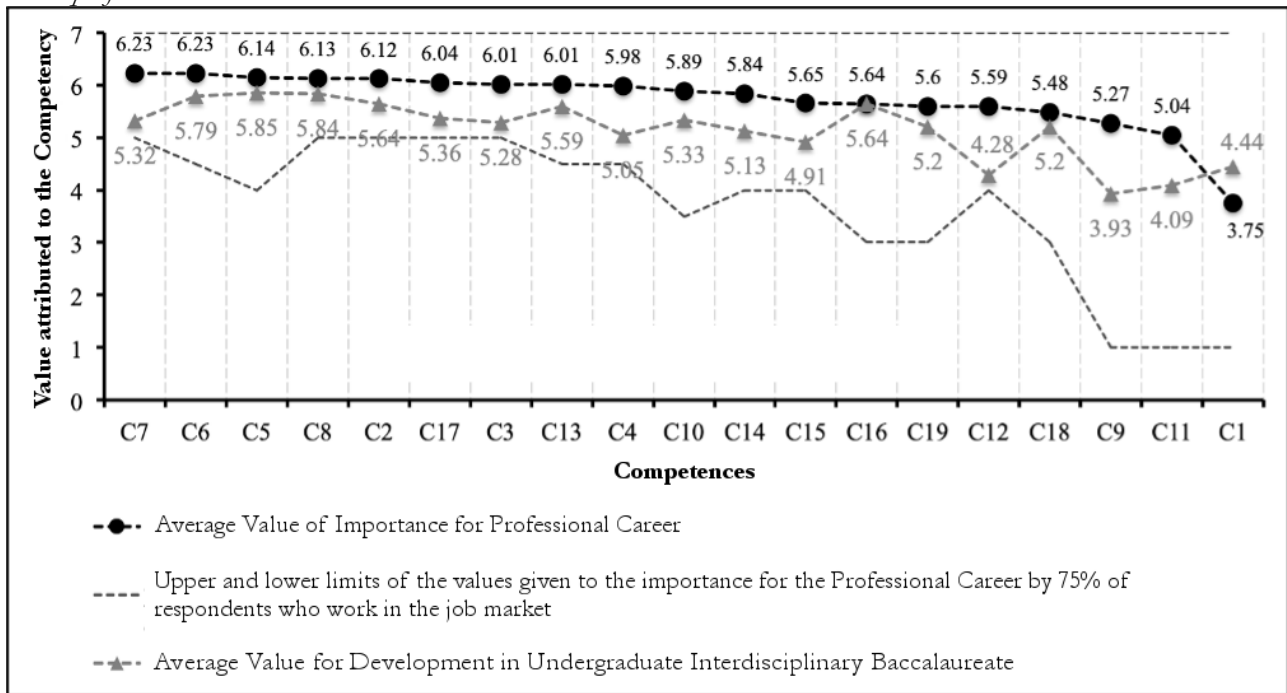
*Results of generic competences according to the level of development during the course and importance for the work, for the graduates who are working*



*Note.* Author’s elaboration.

**Figure 4**

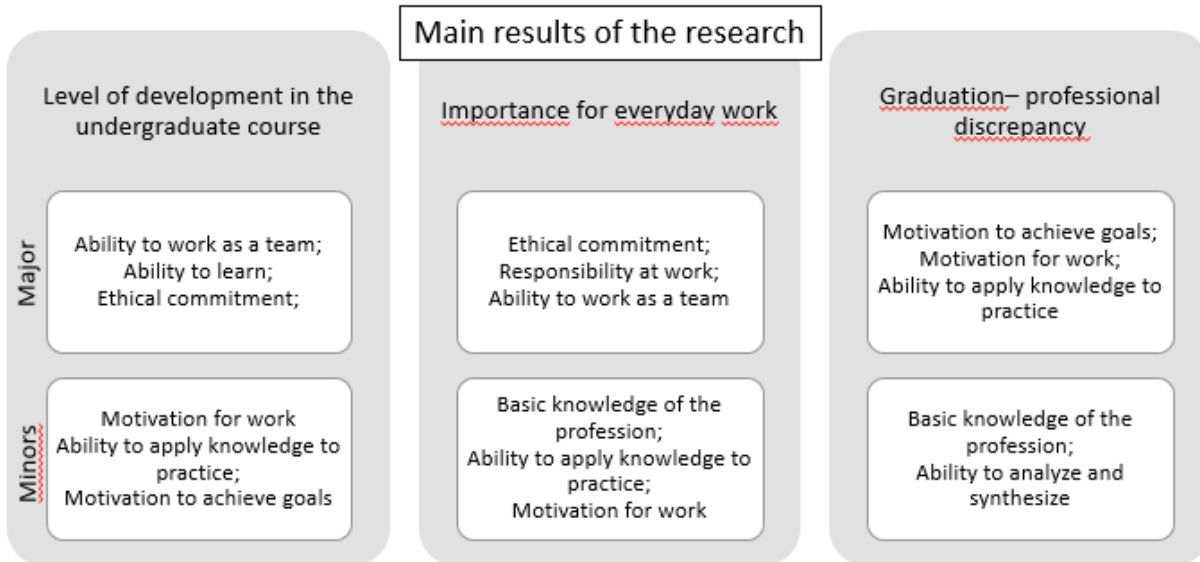
*Comparison between the importance values attributed by BI graduates to the competences developed at graduation and used in the professional career*



Note. Author’s elaboration.

**Chart 1**

*Summary of main research results*



Note. Author’s elaboration.

**DISCUSSION**

**About the development of competences in BI**

There are studies with data we can compare to this one, some even using the same research instrument, a 7-point Likert scale with 19 generic competences subject to the evaluation of the participants. However, the results found here will also be compared with those of research that used other instruments to assess competences (therefore considering other competences in addition to the 19 listed) and that can contribute in some way to the scenario of graduates, with a focus on the relationship

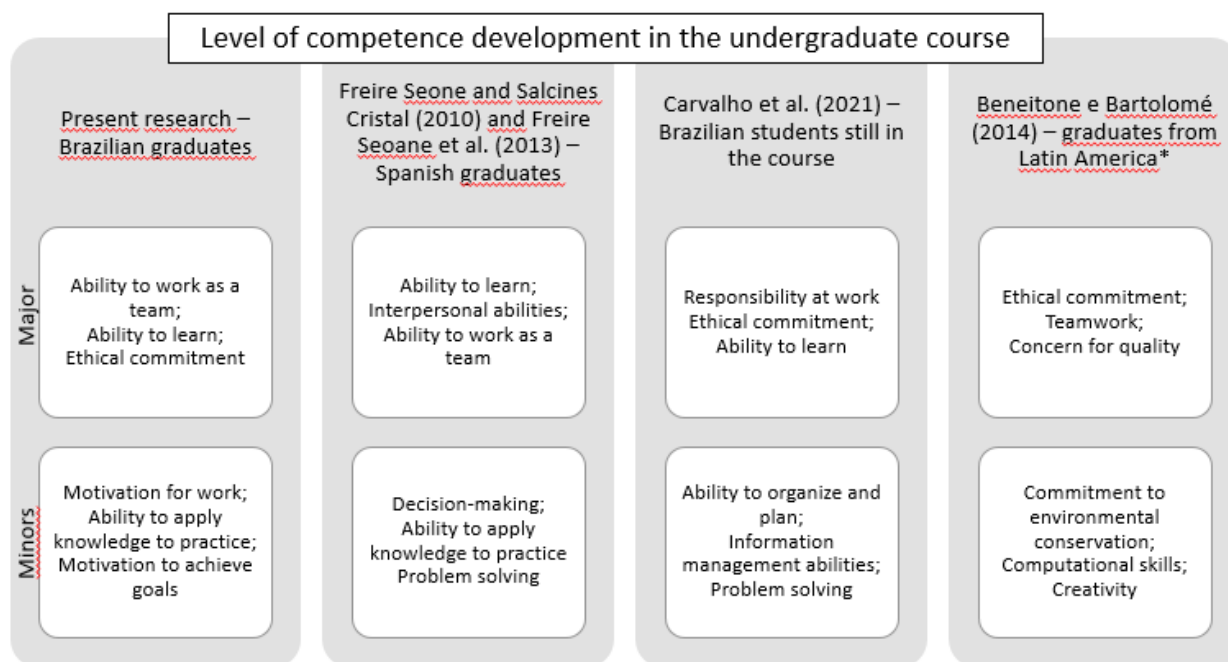
between what was developed at graduation and what is required by the job. Comparison between the results found in this research and those found in other aforementioned investigations, regarding the level of competence development in the undergraduate course, is presented in Chart 2.

Of the investigations that used SGCG, for example, Freire Seone and Salcines Cristal (2010), in an investigation with the aim of deepening the knowledge about the competences of graduates of the University of La Coruña (Spain), evaluated 697 graduates of the aforementioned University. The results showed that the competences Ability to learn (C8, mean = 5.441), Interpersonal abilities (C17, mean = 5.020) and Ability to work as a team (C5, mean = 5.057) were the most indicated by the graduates as being developed during graduation. The least developed competences were Decision-making (C14, average = 4.317), the Ability to apply knowledge to practice (C11, average = 4.351), and Problem-solving (C3, average = 4.398). In another investigation on generic competences, using the same instrument and also in the province of La Coruña, Freire Seoane et al. (2013) evaluated 1,052 graduates and obtained results similar to those of the 2010 investigation. Compared to graduates from La Coruña, Brazilian BI students stand out in the development of the Ethical commitment competence.

In Brazil, Carvalho et al. (2021) evaluated 1,001 university students of private evening education who were attending the third year of graduation, from two universities in the RMBS. The highest valuation in the global sample was attributed to the competence Responsibility at work (C7, average = 6.15), followed by the competence Ethical commitment (C6, average = 6.05) and, in third place, by the Ability to learn (C8, mean = 5.89). At the other extreme, with lower valuation were Ability to organize and plan (C4, average = 5.13), Information management abilities (C15, average = 5.13), and Problem-solving (C3, average = 4.88).

## Chart 2

*Comparison of the level of competence development according to students'/graduates' self-assessment in different surveys*



*Note.* \* evaluation of SGCG was not used. Author's elaboration.

Aimed at comparing and classifying generic competences found in four regions where the Tuning Project took place (Europe, Latin America, Russia, and Africa), Beneitone and Bartolomé (2014) found 16 similar competences in the four regions, considered by the authors as “global competences”. In results only for Latin America by Beneitone and Bartolomé (2014), the competence Ethical commitment appears in 1<sup>st</sup> place (in self-reference of acquisition by students during graduation). Teamwork (2<sup>nd</sup> place) and Concern for quality (3<sup>rd</sup> place) were also frequently mentioned as having been

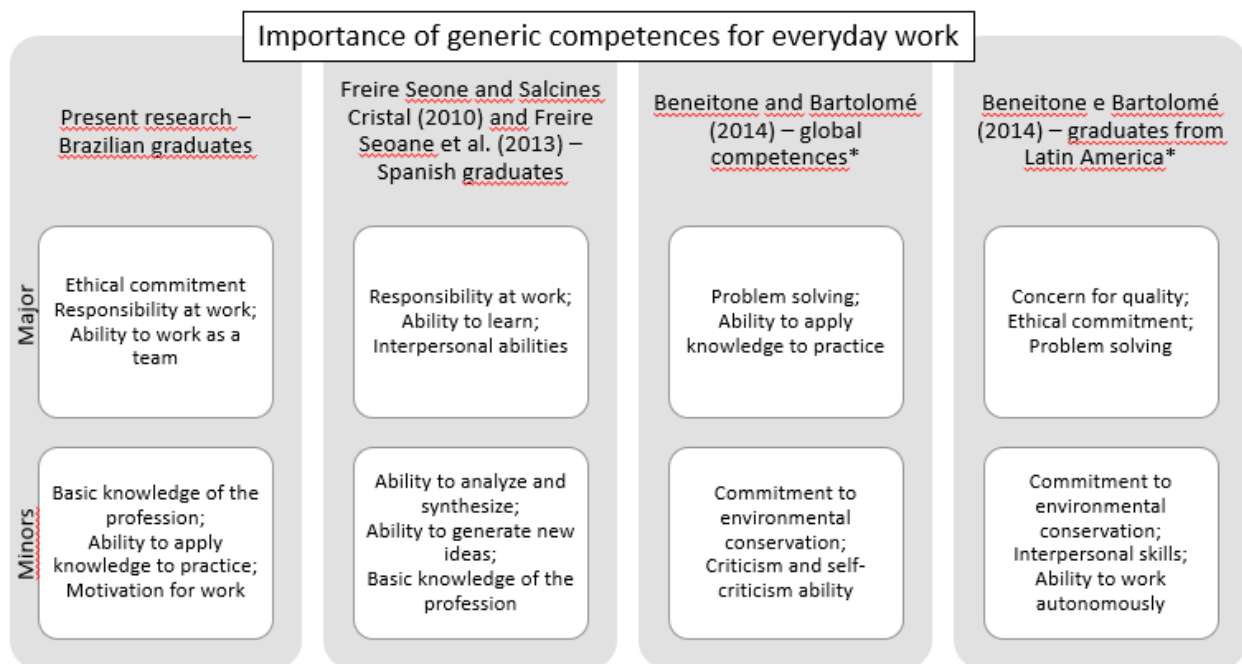
acquired during the undergraduate course. In the investigation, the lowest levels of acquisition of graduates from Latin America were for Commitment to the conservation of the environment (16<sup>th</sup>), Computational skills (15<sup>th</sup>), and Creativity (14<sup>th</sup>) - None of these competences having been evaluated by the questionnaire used in this research. When compared with the results of graduates from other regions, the 16 global competences, even if semantically similar, differed in the level of acquisition in the university course. In a factor analysis of variance, the clusters formed for each region also differed drastically. The authors Beneitone and Bartolomé (2014) credit these differences to the cultural and regional characteristics of each location investigated, which, even in a globalized and similar work context, allows the emergence of the characteristics of specific groups.

### About the importance of work

In the research conducted with graduates from the University of La Coruña, already mentioned here (Freire Seoane & Salcines Cristal, 2010; Freire Seoane et al., 2013), the most important competences for the graduates' work were Responsibility at work (C7, most valued in both investigations), Ability to learn (C8, 2nd place) and Interpersonal abilities (C17, 3rd place). Competences with less importance were Ability to analyze and synthesize (C16, antepenultimate), Ability to generate new ideas (C19, penultimate competence), and Basic knowledge of the profession (C1, the least valued of all 19 competences). Chart 3 shows the comparison between the results found in this research and those found in other investigations mentioned, regarding the importance of competences for the daily work of graduates.

### Chart 3

*Comparison of the level of importance of competences according to the self-assessment of graduates in different surveys*



*Note.* \* evaluation of SGCG was not used. Author's elaboration

Overall results by Beneitone and Bartolomé (2014) indicated the competences of Problem-solving and the Ability to apply knowledge to practice as the most important in the four regions evaluated. We should pay attention to the low evaluation of the importance of competence for work. Ability to apply knowledge to practice: a possible low development in the courses is to some extent expected, as this is often the current criticism made by students. However, its low valuation at work deserves further investigation to better understand both the training offered (in this case, a BI) and the contemporary work dynamics, which, perhaps, work at such a fast pace to the point of losing the meaning of this common image of transposing previously learned knowledge into predictable professional

practice. In short, it is as if, at a global level, research points to the importance of an education that teaches what to do in professional practice, while in this Brazilian sample the results indicate little relevance of this in the set of competences presented.

The competencies with the lowest averages for importance, according to Beneitone and Bartolomé (2014), were Commitment to environmental conservation and Critical and self-criticism skills – both not evaluated by the questionnaire used in this research. In results from Latin America alone, the competences evaluated as the most important were Concern for quality (1<sup>st</sup> place), Ethical commitment (2<sup>nd</sup> place), and Problem-solving (3<sup>rd</sup> place); while the least important were Commitment to environmental conservation (16<sup>th</sup> place), Interpersonal skills (15<sup>th</sup> place) and Ability to work autonomously (14<sup>th</sup> place). Again, Ethical Commitment seems to be part of a Latin American and Brazilian context, different from Spanish graduates, for example.

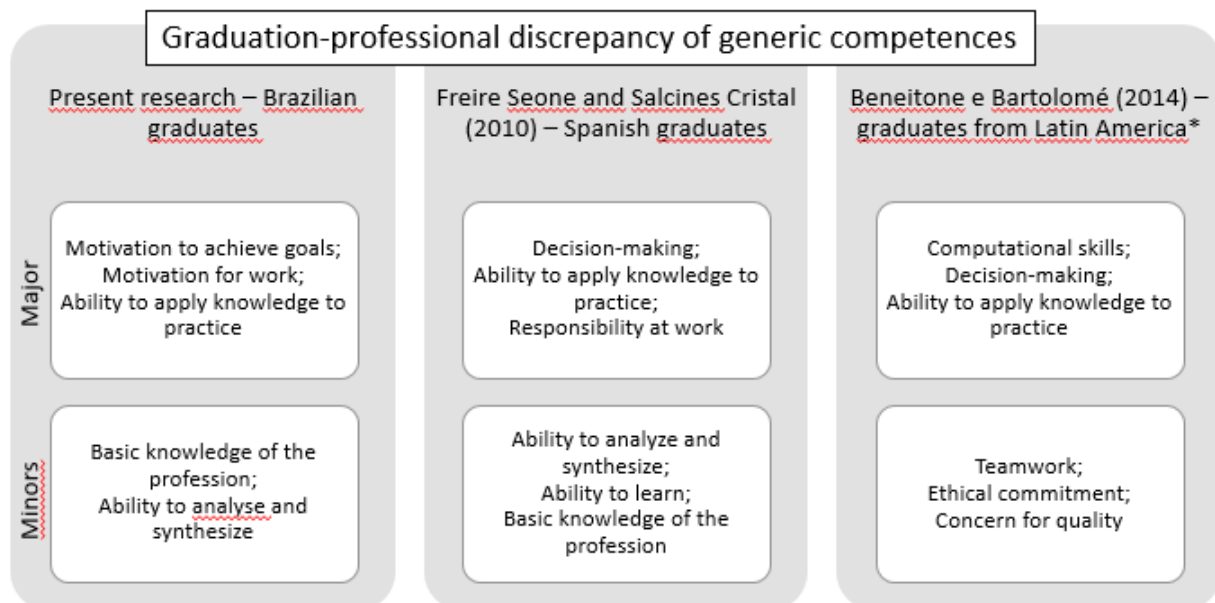
Considering the theoretical study by Pereira and Rodrigues (2013) reviewing, from a census of research, the competences required by continent and in global terms from the perspective of students and employers, it is possible to verify that the data of this study with Brazilian students also converge in the Americas for the competences Ethical Commitment and Teamwork. However, in this study, the authors only cite the most frequent competences, and there is no way to assess whether the least frequent among the Brazilian students surveyed here would also present some convergence, in addition to that presented for the competence Basic knowledge of the profession with the study by Freire Seoane and Salcines Cristal (2010) and Freire Seoane et al. (2013).

### About graduation-professional discrepancy

In general, the result showed graphically for the Graduation-Professional Discrepancy (Figure 4) indicates that the development of competences by the graduates evaluated in the present research during the graduation course is consistent with the demands of the job market, but also indicates in which competences there is a greater need to improve the pedagogical project of the course. Chart 4 shows the comparison between the results found in the present research and those found in other aforementioned investigations, regarding the graduation-professional discrepancy of competences according to graduates' self-assessments.

### Chart 4

*Comparison of the graduation-professional discrepancy of competences according to the self-assessment of graduates in different studies*



*Note.* \* evaluation of SGCG was not used. Author's elaboration.



In the same research already mentioned here, by Freire Seoane and Salcines Cristal (2010), the difference between what was developed at graduation and what is important for work (what they called “differential”, and here we call “graduation-professional discrepancy” was also evaluated). The competences with the greatest differential, and therefore, greater importance at work than what was developed at graduation, were Decision-making (C14, differential = 1.374), Ability to apply knowledge to practice (C11, differential = 1.255), and Responsibility at work (C7, differential = 1.213). The smallest differences were for the competences Ability to analyze and synthesize (C16, differential = 0.456), Ability to learn (C8, differential = 0.427), and Basic knowledge of the profession (C1, differential = 0.109). Results from Spanish graduates are similar to those of this investigation in the greatest differential for Ability to apply knowledge to practice (C11), and smaller differentials for Ability to analyze and synthesize (C16) and Basic knowledge of the profession (C1).

Beneitone and Bartolomé (2014) made a similar evaluation between what was acquired in the undergraduate course and what is important for the work of graduates from four regions of the world (what they called “gap”). The biggest gaps for the entire sample evaluated were for the competences Ability to apply knowledge to practice, Creativity, and Decision-Making. In Latin America, the biggest gaps were for Computational skills (1<sup>st</sup> place, biggest gap), Decision-making (2<sup>nd</sup> place), and Ability to apply knowledge to practice (3<sup>rd</sup> place). The smallest gaps were for Teamwork (16<sup>th</sup> place, smallest gap), Ethical commitment (15<sup>th</sup> place), and Concern for quality (14<sup>th</sup> place). The gap between what is acquired/developed and what is required in the daily work of graduates concerning competence Ability to apply knowledge to practice, is not characteristic exclusive to the Brazilian sample of a BI, but it has representation in several regions of the planet - although in other contexts this competence, which presents high discrepancy, is highly valued, unlike the Brazilian case of graduates of an BI in which it was undervalued.

To this specific point, which may have, among other factors, an impact on employability, relevant data from this research should be added: 46.1% of graduates are working, while 76.7% are continuing their studies. The fact that most graduates continue to study is expected, as it is characteristic of BIs to offer a second cycle of studies. For comparison purposes, still based on the findings of Freire Seoane and Salcines Cristal (2010), the occupancy rate (that is, the fact of being employed) of the sample of Spanish students was 72.67% against 46.1% in the case of Brazilians, considering, in Spain, several areas of training (in particular, several sub-areas of engineering, but also sports, health, and library science) and with a maximum period of five years after completing the courses.

## FINAL CONSIDERATIONS

The discussion of the results shows that this research converges with data from other studies in the same universe. In this study, undergraduate students of the Interdisciplinary Baccalaureate modality who graduated between 2015 and 2019, were investigated in which 76.7% of them are continuing their studies and 46.1% are inserted in the job market.

The greater importance attributed to the Ability to work as a team and the Ability to learn is similar to other studies of global scope, although there are differences in terms of the acquisition. In the case of competence that involves Ethical commitment, there is alignment with the results for Latin America of the studies that took place in the wake of the Tuning project. At the same time, the lower importance attributed to the competence Basic knowledge of the profession also converges with other studies, demonstrating that a lesser focus on disciplinary boundaries is not exclusive to more generalist courses. The reorganization of education, especially in Europe, starting with the Bologna Declaration, had this special focus on adaptability and flexibility. This all tends to be explained also by the dynamics of the contemporary world of work, which started to prioritize generic competences, which can be transferred to different contexts of action. It is not by chance that the smallest distance or discrepancy between the students' view of the course and that required when one is already in the market occurs, in more than one study, also for Basic knowledge of the profession. In both contexts, the valuation is usually low for this specific/instrumental knowledge. The universe of work points to a professional who is more apt to cross fixed boundaries of action, the old occupations or professions.

As a specificity of the results, there was a low valuation of importance for the work of the competence Ability to apply knowledge to practice, which draws attention and invites further studies both on the training offered and on contemporary work dynamics.

A limitation of this study, for sample, was that it was only one Brazilian university with a BI-type course, BICT Mar, which is still a recent model in the country. Even so, we hope to base possible management actions in the field of higher education, and, undoubtedly, new studies should be carried out to advance towards a finer understanding of the interactions between training and work, pedagogical projects, and employability, especially with a focus on new undergraduate profiles, such as BIs, who seek to adapt to new global work contexts.

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\* The translation of this article into English was funded by Coordenação de Aperfeiçoamento de Pessoal de Nível Superior – CAPES-Brasil.

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Author 2 – Conceptualization, Data curation, Writing – first version.

Author 3 – Research, Resources and Writing – proofreading and editing.

Author 4 – Methodology, Formal analysis, Validation, Visualization, Writing - first version and Writing - review and editing.

Author 5 – Conceptualization, Writing – first version and Writing – review and editing.

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## **DECLARATION OF CONFLICT OF INTEREST**

The authors declare that there is no conflict of interest with this article.

**Submitted:** 03/04/2020

**Approved:** 12/06/2021