

## International student's information needs in postgraduate school a literature review

Danille Pimenta do Carmo Rioga<sup>1</sup>  <https://orcid.org/0000-0003-4111-2482>

Renata Maria Abrantes Baracho<sup>2</sup>  <https://orcid.org/0000-0002-8335-9646>

<sup>1</sup>Federal University of Minas Gerais, Belo Horizonte, MG, Brasil / e-mail: [danyrioga@yahoo.com.br](mailto:danyrioga@yahoo.com.br)

<sup>2</sup>Federal University of Minas Gerais, Belo Horizonte, MG, Brasil / e-mail: [renatambaracho@gmail.com](mailto:renatambaracho@gmail.com)

### ABSTRACT

**Introduction:** This literature review article has a lack of studies that deal with the student internationalization process. The main argument is that the identification of these studies will facilitate the comprehension of the process by the interested parties. Furthermore, it aims to analyze studies on the international graduate student's information needs. In addition to it, the Federal University of Minas Gerais is the study reference.

**Method:** The study used a three-step qualitative methodology and was based on three main points: internationalization in Brazilian universities and postgraduate programs, the perception of international students about Brazilian higher education institutions, and the international student's information needs.

**Results/Conclusion:** From this mapping, it was noted that there is a scarcity of publications focused on the international students' information needs, especially postgraduate students, considering the panorama of Brazilian universities.

### KEYWORDS

Information needs. Education. Students. Postgraduate courses.

## Necessidades informacionais do estudante internacional na pós-graduação uma revisão de literatura

### RESUMO

**Introdução:** Este artigo de revisão de literatura tem como problema a escassez de estudos que versam sobre o processo de internacionalização estudantil, cujo argumento principal é o de que a identificação desses estudos facilitará a compreensão do processo pelos interessados. Objetiva analisar estudos sobre as necessidades informacionais do estudante internacional da pós-graduação, sendo a Universidade Federal de Minas Gerais a referência do estudo. **Método:** Por meio de uma metodologia qualitativa de três etapas, o estudo se baseou em três pontos principais: a internacionalização nas universidades e programas de pós-graduação brasileiros, a percepção dos estudantes internacionais sobre instituições brasileiras de Ensino Superior e as necessidades informacionais do estudante internacional. **Resultados/Conclusão:** A partir desse mapeamento, notou-se que há escassez de publicações voltadas às necessidades de informação dos estudantes internacionais, sobretudo dos pós-graduandos, considerando o panorama das universidades brasileiras.

### PALAVRAS-CHAVE

Necessidades de informação. Educação. Estudantes. Cursos de pós-graduação.



JITA: BH. Information needs and information requirements analysis

## 1 INTRODUCTION

The number of international students is expanding in several countries. At the same time, the need to improve education is regularly increasing, especially in higher education, aiming at its quality. It is estimated that by 2025, emerging economies will have around 63 million more university students compared to 2015, and the world number is expected to double to 262 million in the next ten years. Much of this growth will occur in newly industrialized countries, more than half concentrated in China and India. However, student migration, brain circulation, and the internationalization of universities were not as intense as in the current context, according to information released by the United Nations Educational, Scientific and Cultural Organization (UNESCO, 2015, p. 3).

The Federal University of Minas Gerais (UFMG) is part of the world's educational scene, with significant contributions. The institution currently has a total of 48,949 students. According to the most recent count, carried out in 2017, of the total number of students at this institution, 1,021 are international students, linked to Undergraduate and Graduate courses.

It is essential to mention that, from 2014 to 2017, of the total number of international students, the Graduate Program stood out in every year, according to data produced by the Academic Registration and Control Board - Diretoria de Registro e Controle Acadêmico (DRCA) and published by the International Relations Office - Diretoria de Relações Internacionais (DRI) of UFMG. According to DRI (2019), the number of international undergraduate and graduate students was: 2014 (Graduate: 340 and Undergraduate: 1052), 2015 (305 and 1087), 2016 (315 and 664), and 2017 (272 and 749).

The international candidate goes through a process to become a Graduate student at UFMG that involves three stages: contacting the Graduate Program and applying for registration; the approval and procedures for acquiring the visa; and, finally, enrollment, which makes admission as an official international student. Through the steps described, the candidate can become a regular Graduate student (if he completes the Master's or Doctorate course) or an exchange student in the Program (if he attends the course in a short period).

Several departments and activities are involved, carrying out daily procedures throughout the year to ensure the internationalization process for students in Brazilian educational institutions. In the context of UFMG, DRI stands out as the central structure in operation and insertion of this university in the world panorama. So, it relates to foreign institutions to enable the realization of various academic actions.

The first contact of this article's researcher with DRI occurred with studies related to the university internationalization process, developed within the scope of Information Science and initiated during the Master's Program (2015-2016). During this time, the researcher collected data and identified some challenges faced by international students at UFMG. Coming from a diverse exchange program, these students pointed out the lack of access to information during the exchange process.

The Doctorate was proposed as a consequence of the studies developed in the Master's project. The motivation of this study stems from the need to seek more alternatives to increase interactivity and the exchange of information among international students in Graduate courses at UFMG. This motivation is justified by the lack of studies aimed at this audience, as reported by several authors (OH; BUTLER, 2016; OH; BUTLER, 2019, among others), especially in the conditions of Brazilian universities.

Thus, three areas will intersect in the development of Doctoral research, such as Information Science, Education, and Design. In the interaction between these areas, the need

for information, characterized as an Information Science sub-area, as the “background” or investigated object, focused on the international student. After analyzing the collected data, the design will complement and conclude the research when used as theoretical support in generating solutions to address the identified information needs.

The research direction is defined from the interdisciplinary relations of its theme, especially concerning the study about information needs, a theme linked to an interdisciplinary area, such as Information Science. About this, Saracevic (1992) emphasizes the constant evolution of the area since its origin, pointing out three reasons that justify the interdisciplinarity of the area: Information Science is originally interdisciplinary, and its relations with other areas have been expanding; this science is associated with information technology, having a solid technological tendency; and Information Science is a participating and active area in the development of the Information Society (SARACEVIC, 1992).

Based on the arguments proposed by Saracevic (1992), the researcher decided to study the issue of international graduate students' information needs, whose universe of analysis is the UFMG student body in its various campuses. Accordingly, in the Doctoral research, the four campuses of UFMG are considered the research universe (1021 international students), and the sample is 749 Graduate students of all campuses.

In the context of the worldwide flow of people and international students, other people move for different purposes, which suggests that information needs can also be different. According to Caidi, Allard, and Quirke (2010), with millions of people who migrate to other countries and therefore need to integrate into the host society, there are significant opportunities and challenges for the information professions in terms of understanding how immigrants seek information, what are their needs, what practices they have adopted and adapted and the possible barriers they encounter along the way. So, it is significant to map the studies that deal with the international students' information needs to contribute to improving the reception and the adequate provision of conditions for the adaptation of these individuals.

Therefore, this article is characterized as a literature review on the subject. The objective is to analyze studies on the international student's information needs in the universe of Brazilian universities. Therefore, publications that guide the information needs of international students will be identified, describing the reality of Brazilian public universities. As a result, the prominent people interested in the subject are international undergraduate and graduate students, international students, teachers, managers, researchers, and professionals linked to the fields of Education, Information Science, and International Law.

The first activities of the literature review began with an initial list of terms from the keywords of the Ph.D. research table of contents. Subsequently, the searches were performed in two stages: 1- via UFMG login (Portal Capes) and 2- via University of Maryland login (United States). Despite the time, the relevance of the publications was the priority. This is because of the scarcity of studies on the subject. Then, the pre-selected publications from steps 1 and 2 were associated.

After selecting the sources, the discussion process started from a broader context, with a conceptual, theoretical foundation on experiences in other Brazilian universities and a global panorama that addressed the different cultures of students in universities abroad. Hence, the literature review was based on three main points: internationalization in Brazilian universities and graduate programs, international students' perception of Brazilian higher education institutions, and international student's information needs.

The researcher assumed that the scientific literature is scarce regarding the focus on international students' information needs. This statement intensifies when internationalization is aimed at graduate students in the panorama of Brazilian universities.

The article is divided into three topics, besides this introductory part. In the second topic, the

methodology used in the searches and selection of publications is presented. The results address the third topic and describe the details of selected publications, along with the pillars or thematic categories of the literature review. In the fourth and last topic, the final considerations are mentioned, forming the conclusion.

## 2 METHODOLOGICAL PROCEDURES

The literature review carried out in this study consisted of three steps. Due to the scarcity of studies on international graduate students' informational needs, the search for publications was first supported by the relevance of the retrieved publications, regardless of the year of publication.

The first stage of the literature review was carried out in 2019, via UFMG login, whose searches took place in the Capes' journal Portal - Portal de Periódicos da Coordenação de Aperfeiçoamento do Pessoal de Nível Superior (CAPES). The second stage happened in 2020, at the University of Maryland, in the USA, when the researcher was linked to that institution as a visiting researcher. Finally, the third stage manifested itself after the researcher returned to UFMG through the publications of the previous phases.

In the first stage, considering the context of UFMG, during the search, the Portal Capes was used to access five databases: Web of Science, Library & Information Science Abstracts (LISA), Library, Information Science & Technology Abstracts with Full Text (LISTA), Information Science & Technology Abstracts (ISTA) and Reference and Citation Database (SCOPUS). These databases were consulted from a list of the main words that best represented the subject studied, both in Portuguese and English.

At this stage, the terms were related to each other from the search activities, and, sometimes, considering the search results, these terms were alternated in the two languages. During this process, the title and summary of the publications were read, revealing that the literature on the subject is relatively sparse, a finding mentioned by several authors, such as Lima (2017), Oh and Butler (2016), Rezende (2015), among others.

An average of 470 publications was retrieved, being stored in folders named according to the searched words. Then, the publications in each folder were analyzed in-depth with a complete reading of each work's titles, abstracts, introduction, and conclusion. During the reading activity, publications that had common points or some relevant information to be considered were filtered out.

The second stage of the review, carried out at the University of Maryland, during 2020, with the same list of terms used in the first stage. Initially, texts directly related to the Student Program-Graduate Agreement - Programa de Estudantes-Convênio de Pós-Graduação (PEC-PG)<sup>1</sup> and the terms in Portuguese were eliminated. Thus, it was anticipated that the results of the review would be more comprehensive.

Three directions were essential at this stage: 1) consulting a professional who works in search of databases, 2) consulting a specialist in the subject, and 3) validating the terms by a researcher. In the first case, an Information Science librarian (Rachel Gammons) was consulted; in the second direction, an expert in Education Internationalization (Professor Taylor

---

<sup>1</sup> According to the Educational Themes and Portuguese Language Division - Divisão de Temas Educacionais e Língua Portuguesa (DELP), this program was officially implemented in 1981 and offers scholarships to national students from developing countries with which Brazil has an agreement for cultural cooperation and educational, with a view to training in Graduate courses (Master's and Ph.D. courses) in Brazilian institutions of Higher Education (DELP, 2021).

Woodman) analyzed the research themes. Both professionals consulted are affiliated with the University of Maryland. At that time, the areas of Education, Psychology, and Computing were included in the researched databases. The third direction was the selection of terms, carried out by Professor Dagobert Soergel, co-advisor of the Doctoral thesis, from the preliminary list used in the first stage.

The use of the Boolean<sup>2</sup> method was considered about search strategies, whose selected terms, in the English language, were combined correctly, forming the search expressions. Table 1 shows the terms and their combinations, generating the expressions.

**Table 1.** Terms and expressions used in the search, during the second stage of the literature review

Concept/Conceito	Query component - Strings/Expressões de busca
Cross-cultural/Transcultural	("Cross-cultural" OR Intercultural OR Multicultural) / (Transcultural OU Intercultural OU Multicultural)
International ed/ed Internacional	("international education" OR "education internationalization" OR "foreign student" OR "international student") / ("educação internacional" OU "internacionalização da educação" OU "estudante estrangeiro" OU "estudante internacional")
Approach/Abordagem	(design OR "information science" OR "information management" OR "problem-solving" OR "human-centered" OR "user-centered" / (design OU "ciência da informação" OU "gestão da informação" OU "resolução de problemas" OU "centrado no humano" OU "centrado no usuário")
User experience, Communication/Experiência do usuário, Comunicação	(communication OR web OR "user experience" OR UX OR "human-computer interaction OR HCI) / (comunicação OU web OU "experiência do usuário" OU UX OU "interação homem-máquina" OU IHC)
Cultural intelligence/Inteligência cultural	("cultural intelligence" OR "cultural competence" OR "language skills" OR "foreign language")  Note: combine with the international ed concept / ("inteligência cultural" OU "competência cultural" OU "habilidades linguísticas" OU "língua estrangeira") Nota: associe com o conceito de ed internacional
web localization	web localization
Geographical area/Área geográfica	(Brazil OR "South America" OR "Latin America) / (Brasil OU "América do Sul" OU "América Latina")

Source: The authors (2020), based on data validated by Dagobert Soergel.

The terms mentioned in Table 1 were listed by the Boolean “AND,” for example: “Cross-cultural OR Intercultural OR Multicultural” AND “web localization.” Searches were performed via login to the Mckeldin Library website at the University of Maryland and the Google Scholar base. Five databases were searched for related terms: Education Source, APA

<sup>2</sup> It concerns the Boolean Search Method, devised and implemented by George Boole. In this search method, the Or means OR, and, as in Portuguese, the "or" has the function of indicating choice; so, in Boolean logic, it is almost the same thing. Moreover, translating into Portuguese, it means E. As in Portuguese, the E is used to join ideas; in Boolean logic, it is applied in the same way (GOMES, 2020; MARTINS, 2009).

PsycInfo, Education Resources Information Center (ERIC), ACM Digital Library, and Library and Information Science Source (LISS).

The files found were classified according to the search terms and stored in twenty-eight folders, using the resources provided by Zotero. The total number of files retrieved was 547. In an initial analysis, names with missing and duplicate files were eliminated, resulting in a sample of 518 files, subdivided into 28 folders.

From the 518 publications, the selection activity is carried out in two stages. In the first selection, the title and abstract of each publication were analyzed, whose number of folders was reduced and filtered for specific terms, according to the keywords of the thesis Table of Contents. In some cases, publications were relocated between folders after they were read, and standard publications to more than one topic were replicated in the corresponding folders. Then, in the second selection, the publications were reviewed as a whole, and a new selection was made within each folder. The purpose was to summarize the publications and record notes to ensure, in the future, support for the writing of the thesis.

The criterion used to organize the publications in both selections was content analysis, whose generated categories represent the themes or names of the folders. It is noteworthy that content analysis constitutes the verification of communications, using “[...] systematic and objective procedures for describing the content of messages” (BARDIN, 2011, p. 38). Thus, when manipulating the messages, the researcher seeks to confirm indicators and infer what their objective is, focusing on the resolution of two problems: “[...] the antecedents that led to a given statement; and what consequences of these messages [...]”. In this process, the technique is conducted through three phases: “1) pre-analysis, 2) exploration of the material and 3) treatment of results, inference, and interpretation” (BARDIN, 2011, p. 95).

In the pre-analysis, a floating reading is performed, which consists of the first contact with the document and its text, allowing the judgment of impressions and orientations. By deepening the reading of texts, comprehension becomes more assertive, as hypotheses, theories, and possible techniques used in similar materials emerge. The second stage, exploration of the material, systematizes the ordering methods established in the first stage. For the third step, the procedure performed is encoding, defined as a "transformation carried out according to precise rules - of the raw data of the text, which by cutting, aggregation and enumeration, allows achieving representation of the content, or its expression, capable of clarifying the analyst about the characteristics of the text" (BARDIN, 2011, p. 103).

At the end of the selection activities, the analysis corpus consisted of 12 categories (originated with the compilation of folders), containing 70 files. Table 2 describes the generated categories, and the number of files present in each one, from the first and second selection.

**Table 2.** Categories and file numbers in the first and second selection

Category/keyword	First selection/number of files	Second selection/number of files
Brazil and International Students	7	–
Cross-cultural	15	14
Education Internationalization - Concept	4	–
Education Internationalization - Market	15	11
Human-Computer Interaction - HCI	4	5
User-centered design	4	4
Information	2	6
International student	23	11
Language skills	8	–
Social networks	2	4
User experience	14	5

17

Category/keyword	First selection/number of files	Second selection/number of files
Web localization	4	10
<b>Total selected files:</b>	<b>102</b>	<b>70</b>

Source: Research data (2020)

As for the third stage of the review, the files from the previous stages were correlated, in a complementary way, making it possible to confront the themes and encourage discussion of the results. For this, it was necessary to summarize each study, carried out through a full reading, followed by annotations of each text. In this activity, it was noticed that several publications did not contemplate the scope of this study, which led to the exclusion of works, resulting in eight works for analysis.

It is noteworthy that, at first, the title and summary of the pre-selected publications were read, considering their affinity with the research proposal. Then, annotations were made about these publications. Finally, publications were organized by similarity and categorized by theme. The final step was the comparison with other publications.

Thus, in the discussion of the results, a broader context was started, considering a conceptual, theoretical foundation about experiences in other Brazilian universities and a global panorama that addresses the different information needs of these students in universities abroad.

### 3 RESULTS

After a thorough reading of the selected publications, the literature review was based on three theoretical pillars or thematic categories related to the central theme of the thesis: internationalization in Brazilian universities and Graduate programs, international students' perception of Brazilian higher education institutions, and the international student's information needs.

Throughout the presentation of the results, the publications are described individually, mentioning the purpose and results achieved in each one and being aligned with the three theoretical pillars or thematic categories. It is essential to mention that the publications' order is not chronological but relational since the studies are presented based on the relationships between the themes and results addressed by each.

Chart 1 discriminates and elucidates these publications, mentioning the authors' name, the title, the type of document, and the year of publication. Furthermore, the publications are presented according to the distribution of each one in the corresponding thematic categories.

**Chart 1.** Description of selected publications and alignment to thematic categories

Thematic categories	Authors	Titles	Document type	Number
	Rezende, N. A.	Acesso aos programas de Mobilidade Internacional no Ensino Superior: o caso da UFMG à luz de três experiências internacionais	Dissertation	015



Internationalization in Brazilian universities and Graduate programs	Lima, R. M.	Analisando as motivações dos estudantes estrangeiros do Instituto Oswaldo Cruz na Fundação Oswaldo Cruz	Dissertation	017
	Freitas, D.	Strategies in Search for International Partnerships	Journal article	015
	Neves, T. K., Lavarda, R. A. B. e Martins, C. B.	Práticas estratégicas de internacionalização de programas de Pós-Graduação: Estudo de caso em uma universidade pública do Sul do Brasil	Journal article	019
International students' perception of Brazilian higher education institutions	Silva, C. C. S. e Lima, M. C. A.	Percepção do estudante internacional sobre seu acolhimento em instituições de educação brasileiras	Conference article	013
	Bello, K. Q. e Guerra, V. M.	Explicando o bem-estar de estudantes latino-americanos de Pós-Graduação no Brasil	Journal article	018
International student's information needs	Oh, C. Y. e Butler, B. S.	Newcomers from the Other Side of the Globe: International Students' Local Information Seeking During Adjustment	Conference article	016
	Oh, C. Y. e Butler, B. S.	Small Worlds in a distant land: International Newcomer Students' Local Information Behaviors in Unfamiliar Environments	Journal article	019

Source: Research data (2020)

Regarding the thematic category “Internationalization in Brazilian universities and Graduate programs,” it is noted that four of the eight publications in the sample deal with this theme. Of these publications, two were developed as dissertations and two as articles (both published in journals).

The first publication is by Rezende (2015), highlighting that academic studies on the internationalization of Higher Education are not expressively numerous, especially about studies whose analysis focus would be the Brazilian reality. With the results, the mentioned study intended

[...] to contribute theoretically and academically to the discussion on Higher Education internationalization focused on the issue of access and, in practical terms, assist the leaders of higher education institutions in the formulation of new policies and new designs for more internationalization programs, accessible, inclusive and democratic (REZENDE, 2015, p. 8).

Rezende (2015) studied access to UFMG's international mobility programs, comparing it with three foreign universities in Germany, Portugal, and Spain, to determine how mobility

programs influence university students' practical application and exchange within the scope of university undergraduate courses. To this end, the author cites how public policies for the internationalization of education are treated with UFMG, considering the close relationship between DRI and the Ministry of Education – Ministério da Educação (MEC), among other institutions. In this discussion, he considers the role played by Capes with the Ministry of Science, Technology, and Innovation - Ministério da Ciência, Tecnologia e Inovação (MCTI), among other entities associated with the National Council for Scientific and Technological Development - Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq). Unlike other internal bodies of UFMG, DRI also maintains a close relationship in actions, guidelines, and practices and the search for joint programs with the Ministry of International Relations (MRE) (REZENDE, 2015).

Furthermore, UFMG also seems to be advancing in the use of systems suited to the demands of administrative procedures related to university internationalization, particularly international mobility programs (REZENDE, 2015). This study also described the structure of UFMG for internationalization, exposing statistics on the number of students, departments involved, among other elements. However, it emphasizes the student's mobility from leaving Brazil to study, called "flow out," exposing the options for programs, enrollment, and partnerships between the university and organizations in the international sphere. The author also mentions the "inflow" when international students come to study at UFMG, showing the numbers and infrastructure of the university to receive them, although this is not the main subject explored.

The second publication referring to the category “Internationalization in Brazilian universities and Graduate programs” is by Lima (2017), which emphasizes a lack of research on international students who come to Brazil and investigations that explore the motivations of Brazilian students going abroad. Concerning developing countries, according to Lima (2017), there is a greater movement of students leaving rather than entering, such as in Brazil. In this context, projects and actions to support these students occur smaller than projects for receiving students and researchers from other countries compared to Northern countries (LIMA, 2017).

The main objective of this study was to research the motivational processes experienced by international students at the Oswaldo Cruz Institute – Instituto Oswaldo Cruz (IOC) of the Oswaldo Cruz Foundation - Fundação Oswaldo Cruz (FIOCRUZ) in Rio de Janeiro. Data were collected through semi-structured questionnaires answered by thirteen students. The Self-Determination Theory was used as a reference to analyze the students' motivations, as it integrates natural psychological elements and environmental and social aspects. In addition, content analysis was used to analyze the data collected (LIMA, 2017).

The IOC is responsible for training qualified professionals in Public Health through Graduate programs (Masters, Doctorates, and Specializations). All opportunities for Brazilian and international students are disclosed through the institution's website or development agencies when bidding documents are issued. There are two international courses at Fiocruz, coordinated by the IOC, which train masters and doctors in Biosciences and Health in partnership with institutions in Argentina and Mozambique (LIMA, 2017).

Fiocruz has a vast administrative and public service structure, located in branches on the campus and on the institutional website. Within the physical unit and the unique service structure, which Fiocruz and IOC make available to serve international students, the Fiocruz website can be accessed in Portuguese, Spanish, and English. Furthermore, the options are available at the top of the page so that any user, Brazilian or not, has access to information about the institution (LIMA, 2017).

This site provides a specific page for international students with information on passing programs, documentation, insurance, vaccinations, assistance, and services. Besides that,

telephone contacts and e-mails for the International Education sector, the Center for International Health Relations - Centro de Relações Internacionais de Saúde (CRIS), and the address of Fiocruz's Facebook pages and the Association of Graduate Students - Associação dos Alunos de Pós-Graduação (APG) of Fiocruz can be accessed. In addition, the user is informed when academic activities will be held in Portuguese and some public tenders that may require taking the Portuguese Language Proficiency Examination - Exame de Proficiência em Língua Portuguesa (Celpe-Bras), highlighting the importance of basic knowledge of this language (LIMA, 2017).

On Fiocruz's website, information about accommodation and essential contacts for students can be found in the three languages mentioned (LIMA, 2017). The author recognizes that the quality and difficulty in seeking information about the desired course can be a significant factor for an individual who chooses to study in another country. The main motivations found for taking a Graduate Degree in an institution abroad were the search for quality education, the possibility of getting to know a new culture allied to the opportunity for good academic training, the opportunity to develop research in an internationally renowned environment, the institution and funding of the scholarship. Other reasons were also relevant in choosing Brazil as a destination, such as the offer of research areas that do not exist in the home countries and proximity, in the case of South American students (LIMA, 2017).

Lima's study results (2017) indicated that the motivation of students to study in another country is characterized by a complex system of positive factors and is reflected in terms such as happiness, joy, friendship, hope, and the feeling of missing something. The term "violence" is accentuated in the results, which justifies discussion and concern, as it is a possible negative factor about the motivation to remain in the institution and accomplish the program (LIMA, 2017).

Despite the structure available, the results pointed to the need for greater internationalization of the different institutional sectors, as some problematic situations were reported with the institution's faculty, such as prejudice and misinformation. Holding multicultural events, such as lectures, courses, parties, meetings, or the promotion of continuing language training for all workers, suggests that, gradually and over time, Fiocruz assumes a broadly internationalized posture. These demands must be considered necessary, as it is the health of the research student and even their literary production that can be affected in the face of critical situations that, in some cases, could be resolved with institutional support (LIMA, 2017).

Freitas publication (2015) focused on the internationalization process of Brazilian Graduate programs, considering their increased participation in international operations. In this case, all the objectives proposed in the process and its actions involve the top management, professors, employees, and students. Therefore, the four main strategic objectives presented for the Graduate programs are:

- Bilingual educational environment;
- Internationalized scientific and technological production.
- International cooperation, by sending and receiving students, professors and researchers in general.
- International visibility of the program, along with other actions, including the creation of trilingual websites; participation in congresses; international scientific meetings with institutional centers for efficient internationalization; publication in high-impact international journals; and encouragement to Brazilian periodicals, in the search for an international standard, without losing their identity and characteristics (FREITAS, 2015, p. 81).

One of the most critical actions described in Freitas's study (2015) is the importance of information management in all sectors, in the context of Graduate Studies or universities. So, it is necessary "to establish monitoring mechanisms, indicators, collection, organization,

and dissemination of information on the activities and initiatives of internationalization in progress" (FREITAS, 2015, p. 81).

Freitas article conclusion (2015) underlines the importance of planning led by the Graduate Program coordination, involving all program members, together with the university sectors that have relations with the internationalization process, targeting the training of cooperative institutional work, not only based on personal agreements between professors and research groups abroad. The author also supports her ideas in Capes' National Plan for Graduate Programs - Plano Nacional de Programas de Pós-Graduação (PNPG), noting that "[...] today it is not possible to imagine science without internationalization" (FREITAS, 2015, p. 82).

The fourth and last publication of the first theme is Neves, Lavarda, and Martins' article (2019). In this work, the authors state that the internationalization of Brazilian Graduate Studies is one of the main goals of the National Graduate System, registered in the PNPG 2011-2020 and developed by Capes. According to academic performance, at four-year intervals, programs receive grades from 1 to 7, and those classified in category seven are considered competitive in the international context (NEVES; LAVARDA; MARTINS, 2019).

Graduate studies are considered a motivator in the Higher Education internationalization process. To prove this statement, Neves, Lavarda, and Martins (2019) cite the Capes-Print Program, which was implemented to stimulate the internationalization of Higher Education institutions and research institutes internationalization through the expansion and improvement of internationalization actions in programs that offer Master's and Doctorate courses.

In the study by Neves, Lavarda, and Martins (2019), data were collected through document analysis and semi-structured interviews with the coordinators of the selected Graduate programs. The limitations found in this research refer to the analysis of strategies within the programs, as only the coordinators' point of view was considered. Furthermore, the research method did not address possible institutional strategies, which could have collaborated and impacted the internationalization of the studied programs, even if indirectly.

The Graduate program's internationalization is characterized by the contacts of teachers and their relationship networks, which culminate in their insertion in the international educational scenario, a perception highlighted by other authors mentioned in the study. This situation can create a program dependency relationship with these spontaneous actions. Based on the interviews and documents analyzed, it was understood that the internationalization strategies of the *stricto sensu* Graduate programs (Master's and Doctorate courses) that obtained the maximum score in the 2013 CAPES triennial evaluation, in the case of the federal public university studied, occurred in a strongly articulated way. This articulation is manifested when professors' actions occur through contact networks, acting in groups and research centers, and through participation in congresses, publications, and other international events (NEVES; LAVARDA; MARTINS, 2019). In addition, the authors identified some internationalization practices, such as:

- (i) international exchange programs for professors (post-doctoral) and programs students (mainly related to the realization of sandwich doctorates);
- (ii) carrying out projects in cooperation with researchers from foreign universities, which often result in
- (iii) joint publications in indexed journals of high international relevance;
- (iv) the participation of professors in the organization of international conferences and seminars, as well as
- (v) the presentation of articles by professors and students in international events of high relevance in the program's area of activity; and
- (vi) co-tutele doctoral agreements (NEVES; LAVARDA; MARTINS, 2019, p. 102).

The authors found limitations related to the fact that only program coordinators were interviewed. Neves, Lavarda, and Martins (2019) study results emphasized the need for graduate programs to implement articulated and institutional strategies that involve faculty, staff, and students, throughout the Graduate Studies internationalization process.

Two publications are analyzed regarding the second thematic category, "International students' perception of Brazilian higher education institutions." As for the document type, both are articles, one published in a journal and the other in a conference.

Silva and Lima's work (2013) was published a year before the World Cup, held in Brazil. The study highpoints the country's context at that time, attracting more international students, with the perspective of a promising country that could offer opportunities. In this case, Brazil had become a destination option for international students, even if this was not a reality before compared to other countries, considered a priority option for these students (SILVA; LIMA, 2013).

The authors justified the data collection, built from interviews, with a semi-structured script, which addressed the students' perceptions received by Brazilian educational institutions. These institutions were represented by two universities in São Paulo and one in Belo Horizonte, which did not reveal their names in the survey. The authors identified several reasons that might encourage people to study abroad. Highlight as main:

[...] information about the institution, Undergraduate courses, enrollment requirements may correspond to the first impact on services offered in the future. These points can be crucial when choosing an institution, even if the choice results from a combination of other factors, like the academic reputation, the quality, and experience of the faculty, the attractiveness and atmosphere of the campus. Moreover, other points, such as the reputation of the courses offered, the syllabus associated with the pedagogical practices explored, the profile of the student body that it attracts, the social value of issuing diplomas, among other factors. Finally, it is the sum of the positive evidence that students interested in an exchange program have access to (SILVA; LIMA, 2013, p. 6).

|13

Throughout the investigation, it was observed that the perception and influence on the students' decision processes regarding choosing a Higher Education institution for digital resources are cautious. This impression can occur through offering a well-organized website, the speed in answering e-mails, and the quality and relevance of the information sent. Furthermore, Silva and Lima (2013) cite as an initiative that can generate a good impression for students the publication of posts and testimonies on the social networks of other students about the type of reception on campus, since this action can be valued by international students, so to influence the opinion of fellows interested in a particular university.

In addition to the visibility and student attraction strategies, Silva and Lima (2013) mention the value assumed by the teaching-learning process. The authors emphasize the relevance of universities in creating multicultural environments and curricula, which can respect each person's learning style, enabling the constitution of an increasingly intercultural classroom.

The last publication in the second category is Bello and Guerra's (2018) article. This study clarifies that one of the most common forms of migration is the search for specialized and quality higher education, indicated by the significant increase in the number of international undergraduate and graduate students. However, the research is justified by the scarcity of international and national publications focusing on Graduate Studies, particularly within the scope of Latin America. Furthermore, the number of publications is even smaller for international students in Brazil, compared to the information available about Brazilians in other countries (BELLO; GUERRA, 2018).

The previous research aimed to investigate the association between coping strategies and reinforcement of values and subjective well-being of Latin American graduate students in Brazil. The experience of moving to another country, facing an unknown culture can promote stressful situations, whose students will need to adapt adequately to balance their well-being with personal, educational, and professional goals. Moreover, entering the university itself can be stressful for students (BELLO; GUERRA, 2018).

According to Bello and Guerra (2018), when migrating to other countries, a new routine emerges for students, permeated by cultural values different from their own, in addition to the need to learn a new language. Furthermore, this research shows that international students can develop mental health problems such as depression, anxiety, and paranoid reactions, besides sociocultural problems such as language and social activities difficulties, ethnic discrimination, and academic problems, with excessive demands and failure.

Two studies were identified about the third thematic category, "International student's information needs." Similar to the previous category, the two studies are characterized as articles published in a conference and the other in a journal.

Oh, and Butler (2016) clarified, through the results of longitudinal research and the preliminary analysis of follow-up interviews, how the needs for local information of newly arrived international students develop during adaptation to new environments host. In addition, the information-seeking behavior of these individuals was also investigated.

The study also examines the relationships between local information behaviors and demographic contexts of students from the same country but from different states concerning newly arrived students from other countries. However, as newcomers to a host country, international students face several challenges, most importantly, information challenges in adjusting to unfamiliar geospatial environments. They need to learn about the culture and structure of the new environment and various types of local information such as housing, groceries, retail stores, banks, local geography, public transport, and navigation directions. Developing this kind of local knowledge is also considered essential for the general adaptation of international students' lives to new environments. Nevertheless, despite several studies on the adaptation of international students, these studies do not analyze local information needs and student behavior in seeking information during the adaptation period (OH; BUTLER, 2016).

The last work in the third category publication concerns the journal article written by Oh and Butler and published in 2019. The study investigates how students who have recently arrived in a host country face significant challenges due to differences in cultures, languages, social networks, and other social systems, in addition to information problems in unfamiliar environments. To adjust to new environments, international students need local information about housing, local areas, places, services, and transportation. Therefore, the search for and acquisition of local information, that is, local information behavior (LIB), is essential for the general adjustment period of international students' lives in new environments. Oh, and Butler (2019) state that among the studies analyzed, the focus is the search for information using libraries, with the topic on students' information behavior being secondary.

The authors mention that most studies treat international students as a single group in terms of information behavior rather than multiple groups that may exhibit varied information behaviors. Furthermore, little research has investigated the roles of information during students' transition to new environments. Less is known about how international students seek and acquire information to deal with adjusting to their new environment. Therefore, further studies are needed to examine the information behaviors of international students as a diverse group (OH; BUTLER, 2019).

Various social events for international newcomers and networking structures can influence how students acquire information. Oh, and Butler (2019) developed the research based on previous studies of international immigrant information behavior, used different information sources to measure the local information of newly arrived students, the needs, and the use of information sources.

The study results mentioned the differences in information sources by newly arrived international students during the adjustment period and how students from the same country (co-national), but different states participate in these variations. These results reveal how scholars and information professionals can explain the influences of the local context of co-nationals by examining international mobility students' information behaviors, design systems, and services for newcomers from any country (OH; BUTLER, 2019).

#### 4 FINAL CONSIDERATIONS

This article aimed to analyze studies on international students' information needs in the context of Brazilian universities. The study is based on a three-stage qualitative methodology and three main points: internationalization in Brazilian universities and Graduate programs, international students' perception of Brazilian higher education institutions, and international student's information needs.

From this mapping, it was noted that there is a shortage of publications aimed at international students' information needs, especially graduate students, considering the panorama of Brazilian universities. Therefore, in the context of the information needs of international graduate students in Brazil, the main contributions of this literature review are described through the subdivision of three topics: the university, Capes and process management; the quality of disseminated information; and the acquisition and use of information.

As for the university, Capes and processes management, it was concluded that the university, as an educational institution, encompasses its professors, employees, and researchers as essential collaborators that enable a reference for the university that receives students. Therefore, the recommendation is for the university to combine management processes with communication tools involving the institution's employees. The intention is to create a cycle of autonomy for students, from access to the university's website to the communication channels of the Graduate Program, such as social networks and other means of serving the public.

Capes and Graduate programs are interested in the internationalization process, interacting with researchers from universities around the world, enabling the development of research in different areas. The need for the internationalization of Graduate Studies must go beyond the contact networks of professors with universities abroad. The process must also occur through the dissemination of publications, participation in events, co-tutela, exchange of professors and students, partnership in publications, among other actions.

About the quality of disseminated information, it is necessary to have institutional support from universities and public policies that support the reception and the entire process of international student exchange. In this context, the information disclosed to Graduate candidates at a Brazilian university is highly relevant at all stages of the process. In this case, sources and tools for disseminating information by the university are fundamental for the graduate candidate upon arrival in Brazil and during his adaptation period. Furthermore, the information disclosed by the university should preferably be in more than one language, having English as the second language since it is considered the reference language in the academy.

The quality of the type of information active students' access and the easiness of finding this information affect their adaptation and life quality. This context may reflect on studies and academic productivity, with negative impacts. In addition, there are several challenges faced by international students during the adaptation period, from housing, transport, food, services, health, among others. Therefore, they must be studied as diverse groups.

Finally, regarding the acquisition and use of information, there is a difference in the use of information by newly arrived students, who already have a network of contacts with other students from the same country, studying at the receiving university, among students who do not have this support network. Furthermore, it makes a difference for the possible graduate candidate to obtain information from alumni students and active students, especially concerning the structure of the host university and the city where it operates.

Furthermore, when the student arrives to study, he will need other information necessary to establish himself, such as housing, transport, groceries, health care, the internal structure of the university's functioning, among others. Interestingly, official university channels provide information on practical everyday issues. Reception events for international students can influence the way they acquire information, especially during the settlement stage.

The revelations in this literature review indicate how the topic is complex, essential, and requires more profound studies. It is expected that practical initiatives are evidenced from these studies.

## CRediT

**RECOGNITIONS:** Not applicable.

**FINANCING:** This study was funded by the Coordination for the Improvement of Higher Education Personnel - Brazil (CAPES).

**CONFLICTS OF INTEREST:** Authors certify that they have no commercial or associative interest that represents a conflict of interest in relation to the manuscript.

**ETHICAL APPROVAL:** Not applicable.

**AVAILABILITY OF DATA AND MATERIAL:** Not applicable.

**AUTHORS' CONTRIBUTIONS:** Conceptualization, Data Curation, Financing Acquisition, Research, Methodology, Resources, Software, Visualization, Writing - review & edition: RIOGA, D. do C. P.; Formal Analysis, Financing Acquisition, Methodology, Project Administration, Resources, Supervision, Validation, Writing - review & edition: BARACHO, R.M. A; Data validation: SOERGEL, D.

|16

## REFERENCES

BARDIN, Laurence. **Análise de conteúdo**. São Paulo: Edições 70, 2011.

BELLO, Kissel Quintana; GUERRA, Valeschka Martins. Explicando o bem-estar de estudantes latino-americanos de pós-graduação no Brasil. **Avances em Psicología Latinoamericana**, v. 36, n. 1, p. 111-128, 2018. Available at: <http://www.scielo.org.co/pdf/apl/v36n1/1794-4724-apl-36-01-00111.pdf>. Access in: 27 jul. 2020.

CAIDI, Nadia; ALLARD, Danielle; QUIRKE, Lisa. Practice: information Practices of Immigrants. **Annual Review of Information Science and Technology**, v. 44, n. 1, 2010. Available at: <https://asistdl.onlinelibrary.wiley.com/doi/abs/10.1002/aris.2010.1440440118>. Access in: 08 set. 2019.



DIRETORIA DE REGISTRO E CONTROLE ACADÊMICO (DRCA) - UNIVERSIDADE FEDERAL DE MINAS GERAIS (UFMG). **Alunos estrangeiros na UFMG**. Belo Horizonte, [s.n.], 2017.

DIRETORIA DE RELAÇÕES INTERNACIONAIS (DRI) - UFMG. **Internacionalização: relatório de auto-avaliação institucional: primeiro relatório do ciclo avaliativo 2018-2021**. Belo Horizonte, [s.n.], 2019.

DIVISÃO DE TEMAS EDUCACIONAIS E LÍNGUA PORTUGUESA (DELP). **Programa de Estudantes-Convênio de Pós-Graduação - PEC-PG**. Brasília, [s.n.], 2021. Available at: <http://www.dce.mre.gov.br/PEC/PECPG.php>. Access in: 30 jan. 2021.

FREITAS, Denise de. Strategies Search for International Partnerships. **Revista do Colégio Brasileiro de Cirurgões**, v. 42, n. 1, p. 81-82, 2015. Available at: [https://www.scielo.br/scielo.php?pid=S0100-69912015000800081&script=sci\\_arttext&tlng=en](https://www.scielo.br/scielo.php?pid=S0100-69912015000800081&script=sci_arttext&tlng=en). Access in: 27 jul. 2020.

GOMES, Rainer Finelli. **A relevância da política de indexação para a representação e recuperação da informação: uma revisão sistemática**. 2020. Dissertação (Mestrado em Gestão e Organização do Conhecimento) – Escola de Ciência da Informação, Universidade Federal de Minas Gerais, Belo Horizonte, 2020. Available at: <http://hdl.handle.net/1843/34289>. Access in: 24 jan. 2021.

LIMA, Renata Melo de. **Analisando as motivações dos estudantes estrangeiros do Instituto Oswaldo Cruz na Fundação Oswaldo Cruz**. 2017. Dissertação (Mestrado em Ensino de Biociências e Saúde) - Fundação Oswaldo Cruz, Rio de Janeiro, 2017. Available at: <https://www.arca.fiocruz.br/handle/icict/25148>. Access in: 27 jul. 2020.

|17

MARTINS, Elaine. **Lógica booleana? Saiba um pouco mais sobre esta lógica e como ela funciona**. [S.l.]: Tec Mundo, 2009. Available at: <https://www.tecmundo.com.br/programacao/1527-logica-booleana-saiba-um-pouco-mais-sobre-esta-logica-e-como-ela-funciona.htm>. Access in: 24 jan. 2021.

NEVES, Thayse; LAVARDA, Rosália; MARTINS, Cibele. Práticas Estratégicas de Internacionalização de Programas de Pós-Graduação: estudo de Caso em uma Universidade Pública do Sul do Brasil. **Revista Eletrônica de Negócios Internacionais**, v. 14, n. 2, p. 93-110, 2019. Available at: <https://internext.espm.br/internext/article/view/465>. Access in: 27 jul. 2020.

OH, Chi Young; BUTLER, Brian. New comers from the other side of the globe: international students' local information seeking during adjustment. *In: PROCEEDINGS OF THE ASSOCIATION FOR INFORMATION SCIENCE AND TECHNOLOGY*, 1., 2016, [S.l.]. **Anais [...]**. [S.l.]: Association for Information Science & Technology, 2016. Available at: <https://asistdl.onlinelibrary.wiley.com/doi/full/10.1002/pra2.2016.14505301118>. Access in: 27 jul. 2020.

OH, Chi Young; BUTLER, Brian. Small worlds in a distant land: international newcomer students' local information behaviors in unfamiliar environments. **Journal of the Association**

for **Information Science and Technology**, v. 70, n. 1, p. 1060-1073, 2019. Available at: <https://asistdl.onlinelibrary.wiley.com/action/showCitFormats?doi=10.1002%2Fasi.24185>. Access in: 27 jul. 2020.

ORGANIZAÇÃO DAS NAÇÕES UNIDAS PARA A EDUCAÇÃO, A CIÊNCIA E A CULTURA (UNESCO). **Science Report: Towards 2030**. Paris: UNESCO Publishing, 2015. Available at: <https://drive.google.com/file/d/16Wk3L5lzg9-p1LdlLj-e3Dgl1o4Vo4UN/view>. Access in: 27 jul. 2020.

REZENDE, Nicole Antunes. **Acesso aos programas de mobilidade internacional no Ensino Superior: o caso da UFMG à luz de três experiências internacionais**. Dissertação (Mestrado em Administração Pública) - Fundação João Pinheiro, Belo Horizonte, 2015. Available at: <http://tede.fjp.mg.gov.br/handle/tede/356>. Access in: 27 jul. 2020.

SARACEVIC, Tefko. Information Science: origin, evolution and relations. *In: VAKKARI, Pertti; BLAISE, Cronin (Ed.). Proceedings conceptions of library and information science: historical, empirical and theoretical perspectives*. Los Angeles: Taylor Graham, 1992. Available at: [https://www.academia.edu/925298/Information\\_science\\_origin\\_evolution\\_and\\_relations](https://www.academia.edu/925298/Information_science_origin_evolution_and_relations). Access in: 27 jul. 2020.

SILVA, Cláudia Cristiane dos Santos; LIMA, Manolita Correa. A percepção do estudante internacional sobre seu acolhimento em Instituições de Educação Brasileiras. *In: FÓRUM DE GESTÃO DE ENSINO SUPERIOR NOS PAÍSES E REGIÕES DE LÍNGUA PORTUGUESA*, 1., 2013, Maputo. **Anais [...]**. Maputo: [S.n.], 2013. Available at: [https://www.aforges.org/wp-content/uploads/2017/03/C-Silva\\_M-Lima\\_A-percepcao-do-estudante.pdf](https://www.aforges.org/wp-content/uploads/2017/03/C-Silva_M-Lima_A-percepcao-do-estudante.pdf). Access in: 27 jul. 2020.



Article submitted to the similarity system

Submitted: 15/04/2021 – Accepted: 21/07/2021 – Published: 11/09/2021

---