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Information flows in student assistance policies: an analysis at Federal University of Paraná

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ABSTRACT

Introduction/Objective: This research aimed to identify how the information flows that subsidize the actions of the managers of student assistance policy at Federal University of Paraná (UFPR) are characterized. **Methodology:** Data were collected through the application of a structured questionnaire and treated using descriptive statistics and content analysis. **Results:** The results showed that the managers of student assistance policy have complex, dynamic and heterogeneous informational demands, and that they recognize the relevance of information in supporting their decision-making processes. The informational environment is permeated by intervening factors such as: pressure from the academic community, ethical issues, and technological dependence, in addition to the complementarity between the use of formal and informal channels and sources of information. Poor communication, lack of integration between systems, and informational overload constitute barriers that both make it difficult to share information and make its recovery process slower. **Conclusion.** These results outline a descriptive-interpretative diagnosis that can contribute to the development of information flows that are more appropriate for the achievement of student assistance policies, positively impacting all related parties.

KEYWORDS

Information flows. Public university. Higher education. Public policy. Information management.

Fluxos informacionais das políticas de assistência estudantil: uma análise na Universidade Federal do Paraná

RESUMO

Introdução/objetivo: Esta pesquisa teve por objetivo identificar como se caracterizam os fluxos de informação que subsidiam a atuação dos gestores de políticas de assistência estudantil na Universidade Federal do Paraná (UFPR). **Metodologia:** Os dados foram coletados via questionário estruturado, e tratados por meio de estatística descritiva e análise de conteúdo. **Resultados:** Os resultados apontaram que os gestores de políticas de assistência estudantil possuem demandas informacionais complexas, dinâmicas e heterogêneas, e que reconhecem a relevância da informação no suporte aos seus processos decisórios. O ambiente informacional é permeado por fatores intervenientes como: pressões da comunidade acadêmica, questões éticas, e de dependência tecnológica, além da complementaridade entre a utilização de canais e fontes de informação formais e informais.

A má comunicação, a falta de integração entre sistemas, e a sobrecarga informacional se constituíram como barreiras que, tanto dificultam o compartilhamento de informações, como tornam seu processo de recuperação mais lento. **Conclusão:** Estes resultados delineiam um diagnóstico descritivo-interpretativo que pode contribuir para o desenvolvimento de fluxos informacionais mais adequados à consecução de políticas de assistência estudantil, impactando positivamente todas as partes nelas interessadas.

PALAVRAS-CHAVE

Fluxos informacionais. Universidade pública. Ensino superior. Política pública. Gestão da informação.

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1 INTRODUCTION

In modern times, information is widely regarded as a crucial resource for the development of society and organizations (Paiva, Silva, & Lopes, 2020). It is utilized in the institutional sphere to create meaning, build knowledge, and support the decision-making process (Choo, 2003).

According to Nassif (2019), effective management of information is necessary for its efficient flow through the organizational environment. However, the complexity of the elements, interests, and values surrounding this environment adds difficulty to this process. This complexity impacts the flow of information and creates barriers (Inomata *et al.*, 2017), which hinder managers' timely access to the necessary information to conduct their activities (Nassif, 2019).

From this perspective, the study of information flows is becoming increasingly relevant to the field of Information and Knowledge Management. Understanding these flows helps to identify and meet the information needs of society in various contexts, whether public or private (Ruas & Bax, 2020).

Managing information flows is a major challenge, given the variety and complexity of the interests involved. This involves considering the elements that make up these flows, such as actors, information channels, information sources, and information and communication technologies, as well as their influencing aspects, including information needs, determinants of choice and use, information barriers, and speed of retrieval (Araújo; Silva; Varvakis, 2017), in order to support decision-making.

This holds true for Federal Higher Education Institutions (FHEI) as well, as they, like private organizations, also have information processes such as capturing, storing, and utilizing information (Souza; Silva, 2021). Therefore, it is essential to comprehend the characteristics of the information flows within FHEI and how these flows can aid in the development and implementation of their policies and programs.

Regarding higher education institutions, an increasingly studied topic is student assistance policies (Santos; Siqueira; Diniz, 2021; Silva; Sampaio, 2022). These investigations are being conducted following the expansion and democratization of higher education opportunities, as well as the assurance of basic conditions for students to complete their undergraduate courses (Imperatori, 2017). These issues are guaranteed by the National Education Plan as State Policies (Brasil, 2014).

Social policies aimed at democratizing access to higher education, such as reserving places for students from public schools (Brasil, 2012), have enabled individuals from previously excluded social groups to enroll in FHEI. However, socio-economic fragility is prevalent among these students, making it difficult for them to persist in higher education. This often leads to dropping out of courses or hindering their ability to dedicate the necessary quality of work.

As an illustration of the aforementioned characteristics, a survey conducted by the National Forum of Pro-Rectors of Community and Student Affairs in FHEI revealed that 26.61% of undergraduate students come from families with a monthly per capita income of up to half the minimum wage. In this scenario, the policies for student assistance aim to create conditions that promote the retention of students in higher education institutions, leading to improvements in their academic performance and quality of life (Gomes & Brasileiro, 2022).

It is important to understand how the information flows that support student assistance policy managers occur. This understanding can contribute to more coherent management and decisions that align with student demands. Additionally, it can help identify information barriers that restrict the effective implementation of these policies, allowing for necessary adjustments to be made (Souza & Silva, 2021).

Silva and Sampaio (2022) conducted a systematic literature review at the national and international level. They found a research gap in the lack of studies addressing student assistance policies with a focus on the actions of policy managers and the information flows they use.

Therefore, it is important and timely to address the following question: How can we characterize the information flows that support managers of student assistance policies? The purpose of this investigation is to identify the characteristics of the elements that make up information flows, such as actors, information channels, information sources, and information and communication technologies. Additionally, this investigation aims to determine the influencing aspects of these flows, including information needs, determinants of choice and use, information barriers, and speed of retrieval. The ultimate goal is to support student assistance policy managers at the Universidade Federal do Paraná (UFPR).

This research is justified by its theoretical and practical contributions. In terms of theory, there is a lack of studies focused on the elements and aspects that make up and influence the information flows that support local managers of student assistance policies in the HEI environment (Silva; Sampaio, 2022). Thus, this study contributes to the literature by addressing a research gap on relevant and urgent topics from a social and informational perspective. This broadens the theoretical basis for discussions that enable more effective policy management. From a practical perspective, it collaborates with public managers in higher education institutions by diagnosing the characteristics and influencing factors of their information flows. This information can be decisive for the development of policies that more effectively ensure the permanence of students in situations of socio-economic vulnerability, from their entry into undergraduate studies to the completion of their course.

This article is structured as follows: Section 2 discusses information flows and student assistance policies. Section 3 outlines the methodological procedures used in the research. Section 4 presents the results and analysis. Finally, section 5 provides concluding remarks, limitations, and suggestions for future studies.

2 LITERATURE REVIEW

This section presents the bibliographic reference consulted on the topics of information flows and student assistance policies, emphasizing their implementation in the context of the UFPR. It should be emphasized that the intention was not to exhaust these subjects, but rather to provide a better understanding of the theme, as well as a basis for the analyses carried out.

2.1 Information flows

Information flows are present in all modern social contexts. They are dynamic communication processes that aim to transmit valuable information among different users (Razzolini Filho, 2020). Araújo, Silva, and Varvakis (2017) support this view and assign the responsibility of managing information flow to satisfy the complex information needs of managers and organizations.

Castells (2013) emphasizes the importance of flows in society. According to the author, flows represent intentional, repetitive, and programmable sequences of exchange and interaction between physically disjointed positions, maintained by social actors in the economic, political, and symbolic structures of society (Castells, 2013, p.501). Valentim (2010) argues that information flows reflect the environment to which they belong, both in terms of content and form. Therefore, in an organizational context such as higher education institutions, information flows mirror the behavior developed by individuals and organizations in relation

to information.

It is important to note that each individual has their own set of values, beliefs, and knowledge, as well as cognitive, affective, and physiological needs (Nassif, 2019). These factors, along with the individual's environment, shape their information needs and behavior when seeking and using information (Paiva; Silva; Lopes, 2020). With this in mind, the construction of information flows that add value will depend on organizational strategies, actors involved, information content, and objectives.

Information flows can be formal or informal. Formal information flows are structured and have greater visibility. They consist of routine activities and tasks within the organizational environment and are guided by the information culture and values expressed by the organization (Pinto; Molina; Paletta, 2022).

In contrast, informal information flows are unstructured and characterized by their intangibility. These flows are organized based on the 'individual and group experiences of the organizational subject' (Valentim, 2010, p.19). In other words, they are based on the human relationships between the actors involved in their constitution (Paiva; Silva; Lopes, 2020). Although these flows circulate through various means, they are considered difficult to record, making it complex to manage them effectively, especially in environments without a culture of information geared towards this (Valentim, 2010).

Chart 1. Dimensions of an information flow

Dimensions	Training Categories	Concept
Elements	Actors	All those involved in the flow of information, and in the activities inherent to it, and who are in some way responsible for its occurrence.
	Information Channels	Responsible for supporting the transmission of information in the communication process.
	Information sources	Input for obtaining information that will support the activities in which the information flow is inserted.
	Information and Communication Technology	Support to ensure that the flow transactions take place in a feasible way.
Aspects of Influence	Information Needs	Responsible factor for delimiting the beginning of the information flow.
	Determinants of Choice and Use	Aspects that interfere with the choice of source and use of information.
	Barriers	Restrictions occasionally encountered on the path the information must take.
	Recovery speed	Time between the search for information and the answer obtained.

Source: Araújo, Silva and Varvakis (2017)

For Araújo, Silva and Varvakis (2017), the two dimensions shown in Chart 1 form a whole, and it is not possible to envision the construction of an information flow that is not composed, directly or indirectly, of the factors included in these dimensions. The aforementioned authors also emphasize that the integrated analysis of these two dimensions is fundamental to visualizing the functioning of information flows in their entirety.

Once the information flows have been characterized in terms of their constituent elements and aspects of influence, it is appropriate, in order to achieve the objective of this research, to also address student assistance policies, as follows.

2.2 Student assistance policies

Higher education is a tool for social transformation and economic development. Strengthening it, as well as promoting positive impacts on scientific production and technological innovation, increases the number of people with better employment opportunities in fields that require increasingly qualified professionals (World Bank Group, 2020). The relationship between higher education and socio-economic development has been observed in the Brazilian context. This has been achieved through the development of policies such as the expansion of university places (REUNI), democratization (Quota Law), and simplification of access to FHEI (Unified Selection System - USS).

However, Bettinger (2015) notes that the growth in enrollment has not been accompanied by a proportional increase in course completion rates. This has prompted public authorities and researchers to shift their focus from measures aimed solely at increasing access to higher education to developing strategies to keep students enrolled until they complete their undergraduate courses (Imperatori, 2017).

It is important to note that linking higher education with employability and social mobility has led to lower success rates being viewed as a factor in perpetuating social inequalities. This is because failure to complete an undergraduate degree, whether due to dropping out or repeated failures, hinders an individual's social development and perpetuates their socioeconomic vulnerability (Erwin *et al.*, 2021).

Another important factor to consider is that dropout rates not only harm students but also have negative effects on the economic and organizational management of higher education institutions. From an economic standpoint, losing students results in budget cuts since the distribution of resources to HEIs is based on the number of students graduating each term, among other factors (Recktenvald; Mattei; Pereira, 2018). At the organizational level, there are effects related to the management of teaching staff, the number of classes, the number of subjects offered, and the amount of equipment and supplies allocated based on the number of students. These effects can be reduced over the course of the academic term, leading to decreased efficiency in resource allocation (Berka; Marek, 2021).

In the Brazilian context, discontinuing higher education studies has various causes, with socioeconomic issues being the most prominent (Bardagi and Hutz, 2009). Economic fragility impacts students' academic trajectory, both due to the lack of access to cultural goods and practices and the need to balance work and studies (Imperatori, 2017).

The effort to alleviate the negative effects of students' adverse socio-economic circumstances has resulted in the implementation of strategies to assist them in remaining enrolled by providing the necessary conditions. Silva and Sampaio (2022) have identified that these strategies primarily involve the provision of aid, which can be categorized into two types: Aid is provided based on student characteristics, including socio-economic vulnerability and academic merit. There are two types of aid: financial aid, which involves the transfer of monetary amounts to students, and assistance support, which includes services such as housing, food, transportation, and others.

Santos and Freire (2022) argue that the various methods of providing student support are influenced by the historical development of social policies in the institutionalization of education, as well as regional characteristics that shape cultural and legal perspectives on government responsibilities for maintaining education.

In Brazil, the National Student Assistance Program (PNAES) is the primary instrument that regulates the development of student assistance policies in higher education. Decree 7.234/2010 established the program (Gomes; Brasileiro, 2022). The objectives of the PNAES are to democratize the conditions of young people's permanence in public higher education, reduce the effects of social and regional inequalities in higher education completion, decrease retention and dropout rates, and promote social inclusion through education (Brasil, 2010). In

Brazilian higher education, student assistance policies aim to combat retention, dropout, or withdrawal by providing conditions for students to improve their academic performance and complete their studies (Andrade & Teixeira, 2017).

The Priority Areas of Action established by PNAES include housing, food, transportation, health, digital inclusion, culture, sports, daycare, pedagogical support, and support for students with disabilities, global development disorders, high abilities, and giftedness (BRASIL, 2010). The proposal aims to articulate different fronts of action to ensure an expanded standard of social protection.

Although the PNAES is a federal program regulated by normative rules, it only defines the priority areas of action. It does not prescribe how these areas should be carried out. The FHEI has the autonomy to create actions that best suit their needs. This decentralization contributes to the diversity and heterogeneity of the projects implemented at the FHEI.

In this sense, it is up to the managers at the higher education institutions, through decision-making processes, to propose, implement and control student assistance policies. These processes must be based on information flows that make it possible to: (i) survey the student's socio-economic profile, checking which issues have the greatest impact on their academic career (housing, food, transport, mental health...), (ii) identify how these problems interfere with the student's permanence and success (retention, withdrawal, abandonment); and (iii) provide indicators that make it possible to decide which forms of action to implement (financial transfer or provision of services to the student). This presupposes an extensive collection of information from a variety of sources, shared between managers through various channels, and stored in systems that allow for the processing and production of quantitative and qualitative information to support the decisions made.

In view of the above, it is possible to argue that the information flow and the student assistance policies developed within the FHEI have a close relationship, the former being responsible for providing information that legitimizes and brings efficiency to the preparation of the latter.

2.2.1 Student assistance policies at UFPR

UFPR is the oldest university in Brazil, and is a benchmark in the design and development of student assistance policies (Souza; Silveira, 2016). UFPR has more than thirty-three thousand students enrolled in its 136 undergraduate courses (bachelor's, graduate and technologist).

It is worth noting that the UFPR reserves fifty percent of its undergraduate admission places for students who attended high school entirely in public schools, "with sub-quotas for low-income, black, brown, indigenous and disabled students" (Brasil, 2012). In this sense, UFPR has seen an increase in the number of places taken up by students from these social strata, so that in 2019, around 60% of total enrollments were made up of students from public schools (Brasil, 2019).

Although these figures represent an achievement towards the democratization of higher education, they also present a challenge for the institution, which needs to plan policies and actions that ensure conditions for these students to remain in school and have a good quality of life.

At UFPR, these policies are planned and managed by the Dean's Office for Student Affairs (DOSA), which aims to develop and implement "programs and actions that take a comprehensive approach, where assistance is not restricted to the maintenance and survival of students in the institution, but contributes effectively to their individual and global formation" (Brazil, 2023). To this end, DOSA has a multi-professional team made up of 40 civil servants, including psychologists, social workers, pedagogues, accountants, administrators and others.

The student assistance policies managed by the aforementioned pro-rectory are financed with funds from the university's own budget, or from the PNAES, and are organized mainly on four fronts (Brasil, 2009):

- A) Financial Aid: Financial transfers made directly to the student (Permanence Aid, Housing Aid and Day Care Aid);
- B) Material/Logistical Support: Free meals at UFPR's university restaurants; Loan of laptops; Acquisition of high-cost teaching materials; and Support for the presentation of work at scientific events;
- C) Pedagogical Support: Tutoring programs; Monitoring academic performance; and Pedagogical guidance for students; and,
- D) Mental health care: Psychological and social care, provided through individual or collective sessions, such as groups or conversation circles.

The complexity of the demands arising from the situation of socio-economic vulnerability and the volume of students in this situation (at UFPR, around four thousand students are assisted by the assistance policies instituted) (Brasil, 2023), combined with the diversity of policies that need to be thought out, implemented and controlled on an ongoing basis, reinforce the importance of structuring efficient information flows that provide, in a timely manner, the necessary informational support to support the drafting and implementation of comprehensive policies that better meet the specific needs of the students they are intended for.

3 METHODOLOGY

To identify the characteristics of information flows and their influencing aspects in the context of student assistance policies at UFPR, we conducted a descriptive and exploratory study with a mixed qualitative and quantitative approach. The study had a cross-sectional time frame (Vergara, 2009).

The research universe comprised civil servants from the UFPR's Dean's Office for Student Affairs (DOSA), who are responsible for developing and implementing student assistance policies at the university. The non-probabilistic convenience sample (Bruni, 2013) consisted of 31 out of 40 civil servants from the aforementioned pro-rectory who voluntarily participated in the research.

For data collection, we utilized a survey with a structured questionnaire developed on the Google Forms platform. The questionnaire was made available to civil servants via institutional email between March 13th and March 25th, 2023. The questionnaire consisted of 16 questions, 8 of which were related to the composition of the flow's elements and 8 were associated with its aspects of influence. The questions included both multiple-choice and discursive formats.

The study's quantitative data was tabulated in Microsoft Excel spreadsheets, and each respondent was assigned a sequential number from 'R01' to 'R31'. Descriptive statistics were used to analyze the data, with frequency distribution as the primary resource. Percentage analysis was also applied to enable comparisons and prevent misinterpretations caused by absolute numbers (Fávero & Belfiore, 2017).

Content analysis, supported by the Atlas.ti software, was used to examine the discursive responses. The analysis procedures, as prescribed by Bardin (2016), consisted of three stages: (i) Pre-analysis, which involved floating and detailed readings of the answers, identification of units of meaning, and formulation of codes and indicators; (ii) Exploration of the material, which consisted of the classification and grouping of codes into categories and subcategories; and (iii) Treatment of the results, marked by the exploration, comparison, and

interpretation of the categories and subcategories identified. To achieve a more comprehensive understanding of the responses, this interpretation includes the categories and subcategories, as well as the answers to the closed questions and the theoretical framework consulted for this article (Creswell, 2014).

4 RESULTS

In this section, the results obtained are presented in three subsections. The first refers to the dimension Elements that make up information flows; the second deals with the dimension Aspects of influence, while the third seeks to reflect on the results obtained.

4.1 Elements that make up information flows

The analysis focused on the elements that comprise information flows, including actor behavior, primary channels and sources, and available technologies.

Actors refer to individuals or groups involved in information flow who contribute to its occurrence (Araújo, 2014). The individuals analyzed in this study are the employees of the UFPR's Dean's Office for Student Affairs. Their responsibilities include managing action programs that aim to reduce the impact of socioeconomic vulnerability on students' academic performance (R03).

These individuals, who are responsible for formulating student assistance policies, handle two types of information: confidential and public. The term 'former' refers to the personal information of each student, which the civil servant is privy to due to the nature of their professional activity. This information is protected by law and cannot be shared. It is important to note that even among members of staff, there are restrictions on the circulation of certain information. Public information refers to confidential information that has been processed and can be disseminated, as well as research and surveys conducted by civil servants among the academic community. This information serves as a basis for developing assistance policies.

It is important to note that the actors being investigated participate in both internal and external committees of the pro-rectorate. The purpose of these committees is to network policies and actions, which extend beyond the scope of the university's activities. This is because ensuring that students remain in higher education generates demands that go beyond the student sphere. An example of a networked policy is provided by R25.

We carried out a survey of students in order to map out their needs in terms of sports, leisure and culture. Once we had this data, we approached municipal and state bodies to come up with strategies that would enable students in situations of socio-economic vulnerability to access public facilities that provide these services (R25).

Another characteristic of the role played by these actors concerns the collective use of information. According to the participants in the survey, running the programs invariably requires the participation of several work teams, requiring the simultaneous sharing and use of information. This is the case with the program that provides financial aid to students. The implementation of this program requires the involvement of all the teams working in the dean's office, each of which operationalizes information relating to their professional role.

However, one point worth mentioning is that the information captured or generated by each civil servant in carrying out their activities is passed on individually to their team leaders, who have the task of centralizing and processing this information. According to R07, this type of conduct ends up "personalizing" the sharing of information, which "...makes it impossible

for the team to take collective responsibility for receiving, storing and processing the data" (R07).

If, on the one hand, the centralization of information makes information sharing more personal, on the other, it contributes to the emergence of key players. Because they have greater knowledge of the objective of a given program, or have better traffic between teams and management, these players naturally gather the information needed to develop and conduct activities, and are seen by the others involved as a reference to be consulted. In addition, the spontaneous and informal way in which these key players originate gives them greater legitimacy among their peers, who feel more comfortable passing on information.

The points made so far allow us to infer that the role played by the actors in the environment investigated, as well as being fundamental, as advocated by Paiva, Silva and Lopes (2020), is characterized by restricting the circulation of certain information, networking, collective use of information, personalization of conduct, centralization of processing, and spontaneous and informal action by key actors.

Actors need channels to communicate information. The information present in an organization passes through the information channels established within it and these channels provide for the circulation and transmission of information between individuals (Inomata; Rados, 2015). Identifying the channels is therefore important in order to allocate information more appropriately among its users. Table 1 shows the five channels most used by the survey participants:

Table 1. Channels most used by the actors responsible for student assistance policies

Channels	%
WhatsApp	85%
Institutional e-mail	82%
Face-to-face conversations	79%
Electronic Information System (EIS)	74%
Online meetings	55%

Source: The authors (2023)

The analysis of information sharing channels for student assistance policies reveals a dichotomy. Informal channels are favored for the dissemination of information between staff members on the same team or at the same hierarchical level. Formal channels, provided by UFPR, are mainly used for vertical transmission of information between staff and managers at higher hierarchical levels.

Regarding informal communication channels, 85% of respondents reported using the WhatsApp messaging application frequently. This channel was identified as the most efficient and flexible means of communication among actors. Additionally, it enables the formation of groups for collective and simultaneous sharing and discussion of information. This allows individuals who were not present during the initial debate to access the conversation history at a later time, as it is stored in the application's memory. This supports previous research by Malaquias *et al.* (2017), Kwasitsu and Chiu (2019), and Souza and Silva (2021), who identified virtual applications as one of the primary information channels today.

Face-to-face conversations also stand out as a commonly used informal channel, with 80% of respondents reporting its use for sharing information. Once again, the main motivators for using this channel are its agility and ease of use. However, it is important to note that the use of informal channels can be difficult to control and is limited to a small group of actors (Souza; Silva, 2021).

In contrast, formal channels take longer to use but have the advantage of creating a documentary record (physical or virtual) of the information shared (Araújo, 2014). The survey

results indicate that the most commonly used communication channels are institutional email (82%), electronic information systems (74%), and online meetings (55%). Institutional email, which is provided by the institution for civil servants and staff, is primarily used for receiving requests and documents from students seeking assistance, demand assignment by managers, and general communications from other university sectors or the dean's office.

The Electronic Information System (EIS) is the official protocol and document dispatch system of UFPR. It was implemented in 2017 to replace the physical processing of files. The EIS is used to issue and share dispatches, letters, memos, and aid payment slips, among other documents, which justifies its high usage volume. The system is also used to create and validate student assistance policies and programs, resolutions, and notices through electronic signatures that ensure document authenticity.

Additionally, online meetings, which became the fifth most used channel during the COVID-19 pandemic due to social distancing rules and the need for remote work, are facilitated through this system (Silva; Zapszalka; Razzolini Filho, 2022). However, UFPR's multi-campus structure and distribution of student assistance policy managers across five municipalities has increased the use of this channel, as noted by R09. This reflects the importance of the channel's accessibility and convenience for managers in different locations.

The virtual meetings are an important element of integration between the teams. Before, when we had something to discuss, we had to travel to PRAE's headquarters in the state capital. This was impossible to do with the necessary frequency. The pandemic has shown that virtual contact can be just as effective as face-to-face contact (R09).

As for information sources, Rodrigues and Blattmann (2014) define them as everything that generates or conveys information within a flow, and therefore any means that responds to an information need. According to Choo (2003), using a variety of information sources, such as human, textual and online sources, as well as reflecting the entire context of the institution's interests, can prevent information saturation. In this sense, Table 2 shows the sources most frequently consulted by the actors responsible for student assistance policies, segmented into formal and informal sources.

Table 2. Sources of information most consulted by those responsible for student assistance policies at UFPR

Source type	Source	%
Formal Sources	EIS	86%
	Pro-rectorate's institutional website	65%
	Legislation	61%
	History of previous decisions	59%
Informal Sources	Work colleagues	76%
	Online search engines	73%

Source: The authors (2023)

EIS was named as the main source of information consulted by the players. As well as allowing information to circulate, as mentioned in the approach to channels, this system also has the characteristic of being a repository that keeps all the processes it generates on file, as well as the documents linked to each process. The possibility of creating personalized file folders with different types of indexers, and of searching for cases and documents using different forms of consultation, explain why this source is so popular. It also shows a behavior of searching for information internal to the university (general regulations) that guide the actions of these actors in conducting student assistance policies.

Another source of formal information that is widely consulted by the public analyzed is the pro-rectorate's institutional website. This website contains all the notices and information on the aid and support provided, as well as pages explaining all the services and assistance provided. It should be noted that this website was developed and implemented by a member of staff from the pro-rectorate, and the updating of the information on it is regulated by an internal service order, issued by a committee made up of the staff themselves, created with the aim of regulating communication between the institution and the academic community.

The other formal sources usually cited are: (i) Legislation, specifically Decree 7.234/2010 establishing the PNAES, and Law 8.112/90, which provides for the legal regime of federal civil servants, and (ii) History of previous decisions, made by consulting public notices and programs already used in previous situations.

With regard to informal sources, it should be noted that coworkers are often consulted when looking for information, making it the second most relevant source of information for the respondents in this survey, thus corroborating studies by Pereira (2016) and Souza and Silva (2021). In this sense, R11 argues: "There is always a colleague who understands or is more familiar with the subject. Often in a conversation we find out more information than if we searched elsewhere."

Online search engines, especially Google, were cited as a recurring source of information by 73% of the participants. The actors pointed out that the habit of constantly using this search engine for other matters, such as personal situations, encourages its use for work-related issues as well. However, the use of this source requires the participants to take extra care to ensure the reliability of the information retrieved, since "...the internet is full of misinformation" (R10).

Information and Communication Technologies (ICTs) are the last element belonging to the "elements that make up the information flow" dimension to be analyzed. Without ICTs, the flow of information would be limited and incomplete, because in contemporary times communication is intrinsically linked to them. Communication-oriented technology means technology that enables data, voice and video connectivity over the network (Laudon; Laudon, 2022). It should be noted that the constant advance of ICTs provides organizations with the capacity to manage information flows, which are increasingly dynamic and able to provide information with the necessary attributes to support their activities (Ababneh; Aga, 2019).

The analysis of the ICTs made available to civil servants to develop student assistance policies was divided into two categories: Equipment and Systems. For 90% of the participants, the equipment provided is adequate and compatible with their needs. It should be noted that, following the COVID-19 pandemic, there has been an increase both in the amount of electronic equipment made available to civil servants, including the equipping of a room for holding online meetings, and in the constant maintenance of existing equipment, with the creation of a specific unit for this purpose.

With regard to the systems available, 60% of respondents consider them to be secure, although they point out that the possibility of controlling changes to the information entered into them and the insertion of keys restricting access to certain information are factors that could protect information even more effectively. 57% of respondents consider the data storage capacity to be sufficient, but report that the volume of information captured each year, mainly via student registrations, implies the need to transfer files from previous years to the university's internal network, which hinders the process of retrieving this information. 53% of those investigated consider the interface of the systems to be user-friendly, however, in their discursive responses, they suggest that a process of ongoing training should be carried out, "...so that we can understand the updates made to the systems" (R11).

With regard to ICTs, it should also be noted that the systems available do not meet the information needs of 52% of the survey participants. The content analysis showed that among the reasons for this dissatisfaction is the fact that there is no system that brings together all the

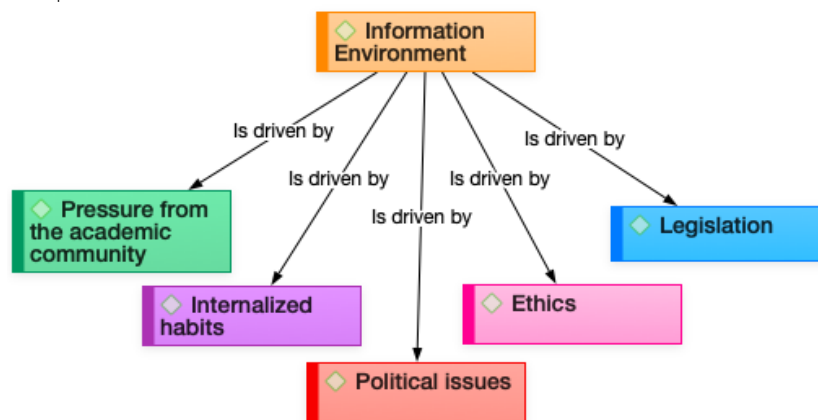
necessary information, leading the respondent to look for information in various sources, some with limited access. Another point of dissatisfaction concerns the impossibility of carrying out certain processing and information filters considered useful for drawing up student assistance policies. As a consequence of these limitations, there is a recurrent use of personal information systems, such as spreadsheets.

4.2 Aspects that influence Information Flows

In the dimension of aspects that influence information flows, the following were analyzed: Information needs; Determinants of choice and use; Information barriers; and Speed of information retrieval.

Identifying information needs triggers the processes that start information flows (Inomata *et al.*, 2017). Information needs do not exist on their own, but are determined by the information environment to which they belong, reflecting the social context, institutional culture, values and personal motivations of the actors involved. According to the participants in this research, the information environment in which student assistance policies are managed is made up of the elements shown in Figure 1.

Figure 1. Composition of the information environment of UFPR's student assistance policies



Source: The authors (2023)

The information environment for student assistance policy managers consists mainly of external factors, primarily from the academic community, which continually demand improvement, expansion, or the creation of new programs. "The information environment is influenced by pressure from students," (R13).

The staff's internalized habits, including information search and utilization procedures, were frequently cited as factors that influence the information environment. Additionally, political issues were treated as 'ideological foundations that guide the establishment of priorities' (R17). Finally, Ethics and Legislation were identified as the other two factors that impact the information environment. These two factors are closely linked because ethics refers to the rules, standards, and principles that individuals and institutions must observe when conducting their activities (Ullah *et al.*, 2022), while legislation objectively regulates these concepts. Thus, the actors suggest identifying informational needs based on ethical and legal reflection about the assumptions that will guide their conduct. Ethics and legislation are shaping elements of the informational context of student assistance policies. It is important to note that the five elements identified in the content analysis coexist and have relative importance according to the historical moment experienced or the decision to be made, as perceived by the respondents.

Furthermore, recognizing an information need involves considering situational, normative, and environmental factors, as described by Ruas and Bax (2020). Choo (2003) also associates this process with perceiving gaps in knowledge or understanding of a given reality. The surveyed managers of student assistance policies face gaps in information needed to structure guidelines for implementing student assistance programs. These gaps include factors related to mental illness, subjects with higher failure rates, budget availability for expanding or creating new programs, students' academic performance as a criterion for maintaining or cancelling aid, the emergence of new recurring social demands, and indicators to measure the results achieved by the policies implemented. It is important to establish relationships between the number of students assisted by each program and the impact these programs have provided.

It is important to note that when selecting information to satisfy a given need, it is necessary to consider certain parameters or determinants that ensure the relevance and viability of the selected information (Santana & Nunes, 2018). The actors surveyed identified several attributes that influence their choice and use of information:

Table 3. Determinants of the choice and use of information by the actors responsible for student assistance policies at UFPR

Attributes	%
Reliability	77,24%
Accessibility	72,58%
Timeliness	71,72%
Completeness	65,51%
Objectivity	65,51%

Source: The authors (2023)

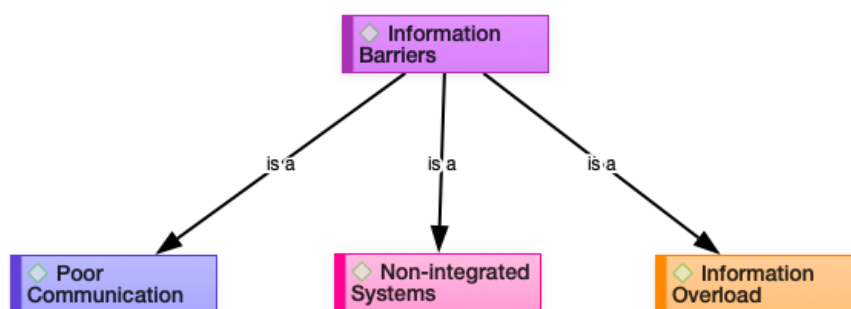
The stakeholders surveyed considered reliability of information as the main criterion, with 77.24% deeming it essential. They argue that reliable information is crucial for formulating policies that have a direct impact on not only academic performance but also the overall well-being of students, sometimes even determining their ability to earn a living. The prioritization of formal sources of information is evident in Table 2. However, reliable information can also be obtained through informal sources, such as consulting knowledgeable colleagues or exercising caution when using information found through online search engines.

72.58% of respondents identified accessibility of information as a criterion for selection and use. They emphasized the importance of being able to quickly, easily, and fully access all relevant information to achieve a policy. In a survey, 71.72% and 65.51% of respondents expressed the importance of timely and complete information, as stated by R01: 'In my area of activity, having access to timely and complete information is fundamental for me to be successful in the choices I have to make'.

Additionally, 65.51% of participants emphasized the importance of objective information when making decisions. Respondents suggest that information should be based solely on facts and free of bias to support a decision technically.

Another factor that affects the flow of information, in addition to information needs and the determinants of choice and use, is information barriers. Inomata *et al.* (2017) define information barriers as noise in the information sharing process, characterized by limitations or restrictions on the efficient use of available information resources. Matta (2010) suggests that information barriers can arise from environmental, personal, or social factors. The content analysis identified three categories of barriers that negatively affect the flow of information on student assistance policies, as shown in Figure 2.

Figure 2. Information barriers of the actors responsible for UFPR's student assistance policies



Source: The authors (2023)

The main barrier identified is poor communication. Inomata *et al.* (2017) state that poor communication is related to a lack of constant dialog, or to messages that lack coherence and objectivity, causing misinformation. In this sense, there was a perception among the actors that the institutionally constituted moments for sharing information or collective constructions are insufficient. R10's account illustrates this perception.

There are few collective spaces for integration or information exchange. The dynamics of meetings, especially between teams, is strongly influenced by the compartmentalization of activities relating to each unit, favoring approaches relating to the execution of actions, to the detriment of policy-making (R10).

In addition, it was noted that poor communication is a bottleneck in the case studied, which means that information reaches its users incompletely or untimely. "I feel that there is some difficulty in communicating actions to civil servants. On a few occasions, I found out about an open call when I was attending to a student" (R07).

The second most recurrent barrier mentioned by those surveyed is the lack of a system that brings together data on each student's history in an integrated way, so that their complete profile can be delineated. Information such as academic performance, receipt of aid or scholarships of various kinds, extension activities and internships carried out were frequently pointed out as relevant information for drawing up student assistance policies and which, as well as being scattered across various systems, are made available without a specific standard or format, making it difficult to reconcile and compare them. In the words of R15:

The information systems are precarious and not integrated (there are systems used by some teams to control information on aid that not everyone accesses and that don't meet the needs of other teams) there is SIGA, which contains information on academic performance - different systems that don't talk to each other (R15).

The barrier "Information overload" was identified as the third barrier impacting information flows. It was found that the context of student assistance policies is complex and dynamic, and requires constant attention and monitoring. An example of this is the survey carried out before the implementation of remote learning at UFPR, due to the COVID-19 pandemic. The university, through the actors investigated here, undertook a survey to identify the difficulties that students would face in taking their subjects remotely, and based on the information gathered, provided electronic equipment, cell phone chips with mobile data packages, and aid to pay for fixed internet contracts. For Silva, Zapszalka and Razzolini Filho (2022), these actions were essential so that students in a situation of socio-economic vulnerability could carry out their academic activities during the remote teaching period.

In addition, the country's worsening economic situation in recent years has contributed to an increase in the number of students applying for aid and support. For financial aid alone,

around eight thousand applications are analyzed every year. In addition, the successive cuts in funding for federal education programs have required the teams to carry out more careful analyses and make more efficient use of resources, given that the volume of students in situations of vulnerability exceeds the amount available in the budget. This has led to a scenario in which the players have to deal with an ever-increasing volume of student registrations, which require the implementation of programs of a different nature, often in shorter timeframes than would otherwise be necessary. For example, in 2020, 23 calls for proposals linked to eight different programs were launched and executed in a single year.

The volume of information often overwhelms our ability to analyze it. It is very difficult to evaluate the effectiveness of our work, or even more efficient working practices, since we are always evaluating student records (R13).

Information retrieval speed, the last aspect to be analyzed in this research, is also the most recent factor to be considered as an influence on information flows. Retrieval speed means the time it takes for a system to transmit or return information. Silveira Netto (2017) states that technology has speeded up the time it takes to retrieve information, imposing on electronic systems the need to increasingly improve their information architecture and usability. This is the reality for student assistance policy managers, 90% of whom indicated speed of data retrieval as an essential factor when choosing to use an information channel or source. It is worth noting that all the channels and sources used by the participants, with the exception of face-to-face contact, require the use of electronic devices, computerized systems or applications and/or the internet, and no mention of the use of analog sources or channels was identified in the respondents' statements.

Saldanha, Brum and Mello (2016) link the basic right of access to information to the speed with which it is retrieved, postulating that agility in retrieving information is a requirement for exercising citizenship. R14's statement corroborates this understanding.

We deal with people, not numbers. People have very dynamic needs. That's why we can't waste time. Information has to be at hand when we need it. Once it's gone, there's no point (R14).

The importance given to the speed of information retrieval by the survey participants is in line with Silveira Netto's (2017) understanding, for whom agility in retrieving data is no longer a differential, but a determining element in the smooth running of the information flow. Thus, as the respondents pointed out, the speed of information retrieval is still unsatisfactory 51% of the time. The slowness in retrieving information is mainly associated with technological dependence, such as the lack of a system or repository that gathers all the useful information, which has already been pointed out in the information barriers, and the need to make improvements in the processing of information indexed in existing systems, which will allow them to generate indicators that are better suited to the information needs of their users.

4.3 Consideration of the characteristics identified

The characteristics of the information flows of the student assistance policies identified in this research are summarized in Chart 2.

Chart 2. Characteristics of the information flows of student assistance policies of the actors responsible for student assistance policies at UFPR

Dimensions	Training Categories	Features
Elements	Actors	Restricting the circulation of certain information; Networking; Collective use of information; Personalization of conduct; Centralization of processing; and Key players.
	Information Channels	WhatsApp; Institutional e-mail; Face-to-face conversations; EIS; and Online meetings.
	Information sources	EIS; Colleagues; Online search tools; Institutional website; Legislation; and History of previous decisions.
	Information and Communication Technology	Suitable equipment; Secure systems; Sufficient storage capacity; User-friendly interface; Failure to satisfy information needs.
Aspects of Influence	Information Needs	Informational Environment: Pressure from the academic community; Internalized habits; Political issues; Ethics; and Legislation. Knowledge Gaps: Mental illness factors; subjects with the highest failure rates; budget availability; academic performance; the emergence of new social demands; and indicators of the results achieved.
	Determinants of Choice and Use	Reliability; Accessibility; Timeliness; Completeness and Objectivity.
	Barriers	Poor communication; Non-integrated systems; and Information overload.
	Recovery speed	Primordial, mas insatisfatória. Dependência tecnológica.

Source: The authors (2023)

The information flows of student assistance policies, as depicted in Chart 2, demonstrate a scenario in which the involved actors must cope with limited circulation of certain information while utilizing it collectively. These actors acknowledge the significance of information as a subsidy for their decision-making. This is evident in their need to collect information predictively for policy networking and in the establishment of parameters such as reliability, accessibility, timeliness, completeness, and objectivity for the selection and use of information. Furthermore, the participants' work demonstrates intricate, dynamic, and diverse information requirements. These demands are influenced by external pressures and technological dependence, as well as civil servants' internalized habits, values, and legislative obligations.

Consequently, information retrieval and sharing involve the simultaneous and complementary use of both formal and informal sources and channels. Formality is most evident in the vertical sharing of information, where systems, websites, and emails provided or maintained by the institution are most frequently used. Informality, on the other hand, is accentuated in the sharing of information between teams at the same hierarchical level. WhatsApp and face-to-face conversations stand out as ways of gathering and transmitting information quickly and flexibly.

According to Barbosa's (2020) research, ICTs are considered essential for the proper and efficient flow of information. Electronic equipment was found to facilitate this process when available in sufficient quantity and quality. Management information systems, on the other hand, presented a dual reality. Although they had satisfactory storage capacity and a user-

friendly interface, they also acted as a barrier to information. The lack of a system that consolidates the information necessary for developing care policies and standardizes it in a single format justifies this perception. This not only results in unsatisfactory retrieval speed but also makes processing difficult.

The technological issue directly affects the information overload experienced by players, which is a contemporary social phenomenon. This overload acts as an information barrier that limits the work of the surveyed managers on other fronts. The actors related information overload to the volume of students in situations of socio-economic vulnerability and the number of programs that need to be run simultaneously. Additionally, the need to consult various sources, shortcomings in filtering and processing information in existing systems, and the use of auxiliary systems such as spreadsheets contribute to this overload. It is important to address these factors to manage information flows more effectively.

Finally, the research revealed that poor communication is a barrier to the flow of information, in addition to limitations related to technology and information overload. It is important to reflect on this finding, considering that there are formally instituted moments for exchanging information, committees or working groups in place to draw up or control the programs implemented, and documents are even drawn up by these committees. The case study reveals that inadequate communication is not caused by a lack of information sharing, but rather by the personalization of the shared information and the unsuitability of the channels used to transmit it. The perception that informal channels are frequently used to share information is supported. However, these channels make it impossible to effectively control the scope of the information disseminated and the integrity with which it reaches its users.

5 CONCLUSION

Student assistance policies are the tools guaranteed by legislation and developed by the higher education institutions to enable students in situations of socio-economic vulnerability to fully complete their degrees with dignity and quality of life. In this way, a better understanding of how the information flows that support the development of these policies work can help formulate more effective programs and actions. With this in mind, this study identified the characteristics of the information flows that support managers in implementing student assistance policies at UFPR, thus producing new knowledge about the elements that make up these flows, as well as the aspects that influence them.

The analysis found that the actors who develop student assistance policies have complex, dynamic and heterogeneous information demands, which in some cases go beyond the university's sphere of activity. In this sense, they establish parameters that ensure, among other things, the reliability and timeliness of the information that will be retrieved and used to support their decision-making.

The information environment in which policies are developed and implemented is permeated by intervening factors such as external pressures, ethical issues and technological dependence, as well as complementarity between the use of formal and informal information channels and sources. In addition, ICTs in the context investigated show a scenario in which the use of technological resources is both a facilitator of information sharing, in the case of online meetings, and an information barrier, which makes information retrieval and processing more time-consuming. This factor, combined with the volume of students to be served and the number of programs run, leads to information overload.

The findings of this study make theoretical contributions. Firstly, they broaden the scope of research into two important contemporary issues: information flows and student assistance policies, examining them together through an interdisciplinary social prism. Secondly, it demonstrates that these themes not only coexist, but that the elements and aspects

of information flows can have an impact on the design and implementation of student assistance policies, suggesting the creation of new research fronts aimed at understanding these potential impacts. Thirdly, the study provides a framework that presents and details the various characteristics of the information flows of student assistance policies, segmenting them according to the dimensions that make up the flows.

The survey of these characteristics has practical implications as it provides a diagnosis that can direct efforts and resources towards developing solutions to overcome barriers to establishing information flows for student assistance policies.

However, this research has limitations in data collection. The use of a structured questionnaire may introduce biases or fail to cover all possible answers. Additionally, the scope of the study was limited to a single institution, which allowed for more in-depth results but may not be generalizable to other universities.

Additionally, the scope of the study was limited to a single institution, which allowed for more in-depth results but may not be generalizable to other universities. These limitations highlight the need for further research to address these issues. Suggestions for expanding data collection methods include interviews, focus groups, and participant observation. These methods can maintain the depth of findings and reduce the possibility of bias. It is recommended that this research be replicated in other higher education institutions to compare and contrast the results of this investigation. This will provide an overview of the impacts of information flows on the management of student assistance policies in Brazilian universities.

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