Methodological approaches applied to the collaborative development of a multiformat guide

Abordagens metodológicas aplicadas ao desenvolvimento colaborativo de um guia multiformato

Ana Rita Rodrigues dos Santos, Elizabeth Romani, Francisco de Paula Nunes Sobrinho, Eriadne Teixeira do Nascimento

inclusive design, assistive technology, multiformat guide

The right to access information must be ensured in all contexts, particularly in educational institutions. This article outlines the methodological strategies for developing a multiformat guide for student support services at Federal University of Rio Grande do Norte (UFRN), emphasizing communication accessibility. Based on a Scoping Review and an inclusive design approach, the following research tools were used: two distinct focus groups and a co-creation tool. With the collaboration of a multidisciplinary team, the research identified significant barriers to information access, and its findings provided relevant data for developing guidelines that informed the guide's creation.

design inclusivo, tecnologia assistiva, guia multiformato

O direito ao acesso à informação deve ser assegurado em todos os contextos, especialmente em instituições de ensino. Este artigo apresenta as estratégias metodológicas utilizadas no desenvolvimento de um guia multiformato sobre os serviços de apoio aos estudantes da Universidade Federal do Rio Grande do Norte (UFRN), com ênfase na acessibilidade comunicacional. A partir de uma Revisão de Escopo e a abordagem do design inclusivo, foram aplicados os seguintes instrumentos de pesquisa: dois grupos focais distintos e uma ferramenta de cocriação. Com a colaboração de uma equipe multidisciplinar, a pesquisa identificou barreiras significativas no acesso à informação, cujos resultados proporcionaram dados relevantes para a elaboração de diretrizes que nortearam a criação do guia.

1 Introduction

Information, whether in print or digital formats, is an integral part of daily life, appearing in various contexts – from checking messages on a mobile phone to the prominent presence of billboards in public spaces. In more specific settings, such as within a federal university, it is understood that information must be provided in an equitable and accessible manner to the entire community and external audiences interested in the institution. According to Grilo et al. (2019), information serves as a resource that permeates all aspects of the academic environment and extends to the public administration sectors of the country.

At the Federal University of Rio Grande do Norte (UFRN), challenges persist in communicating information, particularly regarding student support services. This raises important questions about the effectiveness of current communication formats and whether they truly meet the needs of the entire academic community, with special attention to individuals with disabilities and/or specific needs. This article outlines the stages of a graphic design project to create a multiformat publication, developed with input from a multidisciplinary team, to improve communication accessibility for a diverse audience.

As described by Sousa (2018), the multiformat book is a printed publication that provides multiple ways to access its content. Multiformat books are part of a subcategory of accessible works, defined as books that offer more than one alternative form of translation either in a single medium or across multiple are defined as books offering more than one alternative form of translation, either within a single medium or across multiple media (Mayer, 2019, p. 46). Among the various formats listed, Mayer cites audiobooks, audio descriptions, video books, pictogram-based texts, braille, tactile images, image descriptions, plain language, storybooks, page layout variations, tactile recreations, enlarged text, or increased font size. Therefore, the concept of a multiformat book encompasses not only printed publications, as indicated by Sousa (2018), but also digital formats.

Given the broad range of formats available to reduce communication barriers in print and digital media, it is essential that the project be developed through collaborative processes involving designers, assistive technology experts, and end users. This approach aligns with the principle of "Nothing about us without us," as William Rowland advocates (Sassaki, 2007, p. 7). Furthermore, a project of this nature must be grounded in the Inclusive Design approach, which considers the diversity and uniqueness of individuals as essential elements in creating accessible products, in alignment with the principles of Universal Design. This concept is applied to initiatives that promote the social inclusion of individuals with disabilities and/or specific needs – whether permanent or temporary – while avoiding any form of segregation. The participation of these individuals in all stages of project development and the social validation of the process is essential (Souza, 2021; Grilo et al., 2019; Gomes & Quaresma, 2017).

This article presents the research findings conducted by Nascimento (2023) and Santos (2023). The study aimed to explore the methodological strategies – based on a collaborative approach – used in developing informational content and the graphic design of a multiformat guide on student support services provided by UFRN. The research was motivated by a problem related to the impact of empirically proven communication breakdowns in the formal exchange of information between the university and its users. Although the initial focus was on addressing the needs of individuals with visual and/or hearing impairments, future versions of the guide will address additional disability conditions.

Scientific evidence, as identified by Santos et al. (2025), indicates that despite political and regulatory efforts to broaden access to information, significant barriers remain that impede its full realization. These persistent

challenges demand that both public and private institutions adopt strategies to mitigate communication breakdowns between individuals and their environments (Monteiro & Fernandes, 2022; Borelli et al., 2021; Melendez, 2021; Verhine, 2020; Grilo et al., 2019; Salasar, 2019; Sarraf, 2018; Salton et al., 2017; Mayer, 2011; Sassaki, 2009; Torres et al., 2007). Empirical studies reveal that inadequacies in information organization – such as non-intuitive interfaces, insufficient content hierarchy, complex navigation structures, and a lack of accessibility features – negatively affect information access and use, particularly for individuals with disabilities. These findings highlight the critical need for solutions that effectively address and eliminate such barriers. Within the domain of graphic design, studies by Garcia (2022), Bueno et al. (2022), Lima et al. (2021), Brazil (2020), and Salton et al. (2017) emphasize the importance of adopting visual design principles that promote equitable, flexible, simple, and intuitive user experiences. These principles should ensure that information is easily perceptible and accessible with minimal physical effort, thereby meeting the diverse needs of all users.

The originality of this study lies in the limited number of publications on the subject, mainly due to the challenges of conducting scientific investigations involving individuals with diverse characteristics and specialized knowledge. This research provides new insights and valuable contributions to the field of information design. The article details the methodology employed and the results achieved by applying multiple methods that integrate scientific and empirical evidence.

2 Method

This study adopts an interface-focused, multi-method research design that combines a Scoping Review with procedures for developing a graphic design project.

Participants were selected through convenience sampling and represented varying levels of familiarity with communication accessibility and student support services offered by the university. The group included students, faculty members, administrative-technical staff from UFRN, and an external Assistive Technology expert.

The research was conducted at the Federal University of Rio Grande do Norte (UFRN), a public institution of higher education structured as a multicampus system and classified as a federal autarchy under the Brazilian Ministry of Education. Its administrative headquarters are located on the main campus in Natal/RN. The academic community comprises more than 43,000 students and approximately 5,500 staff members, including tenured academic and technical personnel, as well as substitute and visiting faculty, all of whom bring diverse profiles and needs.

Data collection took place at the university's central campus between December 2022 and June 2023. The following research procedures were employed: (1) two separate focus groups; (2) a co-creation tool; (3) two usability tests – one assessing a low-fidelity prototype of the informational content, and the other evaluating a mid-fidelity prototype

of the guide's graphic design; (4) a sociodemographic, academic, and professional questionnaire.

These complementary instruments served to identify, through direct participant input, the essential elements for developing a multiformat guide, both in terms of informational content and visual design. The data gathered were analyzed using thematic content analysis, following the methodology proposed by Bardin (2016).

Specific methods and tools were employed to organize the research into macro and micro phases, as described by Munari (1981) and Bonsiepe (1984) and summarized in Table 1 to structure the study and meet its objectives. Additionally, findings from a Scoping Review conducted by Santos et al. (2025) were integrated into the analysis.

Table 1 Macro and micro design phases in the development of the multiformat guide.

Macro phase	Micro phase	Instruments
Problematization	*Problem definition* • Taxonomy of student support services offered and disseminated by UFRN	• Documentary research
	Output: identification of key issues and potential primary syntheses	
Research	*Data collection and analysis of materials and technologies* • Data related to information organization and exploratory potential of a multiformat guide • Guidelines for developing a multiformat guide	• Focus Groups 1 and 2 • Visual Research
	Output: definition of design requirements	
Preliminary design	*Development and evaluation of alternatives* • Ideation based on data collected in previous phases • Proposal of informational content and graphic design prototypes	• Co-creation sessions
	Output: proposal of design alternatives	
Preliminary model	*Finalization, refinement, and evaluation* • Assessment of prototypes • Refinement based on participant feedback • Collection of participant profiles	• Usability tests • Sociodemographic, professional, and academic questionnaire
	Output: presentation of the multiformat guide	

The procedures were systematized into the following stages: (1) a macro phase of problematization, corresponding micro phase of problem definition; (2) a macro research phase, with a micro phase focused on data collection and analysis, encompassing materials and technologies related to the systematization and organization of information, as well as the exploratory potential of a multiformat guide; (3) a macro phase of preliminary design, paired with a micro phase for the development and evaluation of alternatives for the product's conceptualization; and (4) a macro phase of preliminary model, with a micro phase dedicated to refinement, finalization, and evaluation, during which both a low-fidelity prototype of

the informational content and a mid-fidelity prototype of the guide's graphic design were assessed.

Given the scope of this research, the present study focuses on the outcomes and discussions derived from the macro phases of problematization, research, and preliminary design, all of which were developed collaboratively by a multidisciplinary team. The macro phase of preliminary model will be addressed in a future stage of the project. This study was approved by the Research Ethics Committee (CEP/HUOL – CAAE: 63268522.6.0000.5292).

3 Results and discussion

During the macro phase of problematization, documentary research was conducted to identify the primary challenges in producing the guide's informational content and to propose preliminary solutions. This investigation involved an in-depth review of UFRN's institutional website, its academic units, and newsletters published in "Notícias da UFRN" – a communication outlet managed by the university's Communication Agency – covering the period from February 2021 to January 2023.

Beyond the institutional documentary research, a theoretical framework on digital accessibility was developed, which supported the graphic project. The process of creating digital documents within the scope of communicational accessibility is intrinsically linked to the principle of digital accessibility, which ensures unrestricted access to digital content, enabling individuals – regardless of specific needs or disabilities – to navigate, use, understand, and interact with digital documents, websites, or systems autonomously and independently (Salton et al., 2017; Brazil, 2020).

The initial step in developing an accessible document involves selecting the appropriate software, as this choice determines the possibilities for incorporating multiple formats and accessibility features. When opting for the PDF format to produce a multiformat guide, Salton et al. (2017) highlighted that its accessibility depends on creating a properly structured file. This includes using semantic tags to ensure a logical reading order, inserting alternative text for images, well-structured tables, and other best practices.

Given the complexity and scope revealed by the problem taxonomy, multiple versions of the guide would be developed. These versions would integrate different languages and accessibility features to effectively address the diverse needs of the target audience.

In the macro research phase, two remote focus groups were conducted using the Google Meet® platform, with full session recordings. Focus Group 1 occurred in December 2022 and included six participants with diverse profiles. The objective was to explore both the potential and the instrumental barriers related to the graphic design of an accessible document. Focus Group 2 was held in February 2023, involving five participants, and aimed to identify strategies for more transparent and more effective content organization, particularly for people with disabilities and/or specific needs. In both sessions, a structured question script guided the

discussions, which were contextualized by the researchers at the outset. Questions were presented visually on-screen, read aloud, and interpreted into Brazilian Sign Language (Libras) to ensure information accessibility for all participants. Each participant was allotted up to five minutes to contribute, resulting in 225 minutes of recorded data – 105 minutes for Focus Group 1 and 120 minutes for Focus Group 2. Figure 1 outlines the profile of the participants involved.

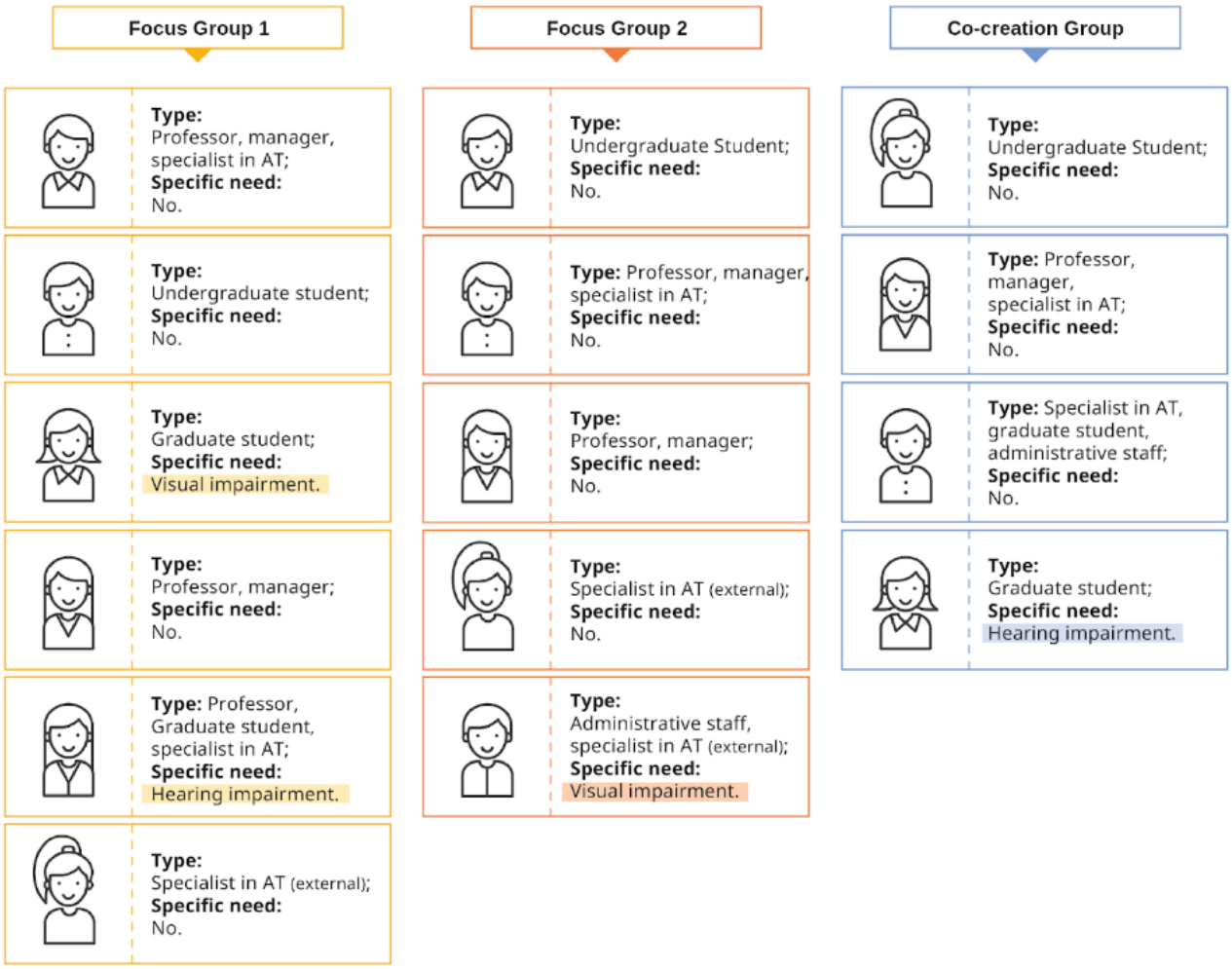


Figure 1 Demographic profile of participants.

The project was contextualized during the focus group sessions (Figure 2), and guiding questions were used to confirm the initial hypotheses. The responses were transcribed and analyzed following Bardin's (2016) thematic content analysis, comprising three stages: pre-analysis, material exploration, and result analysis (Figure 3).

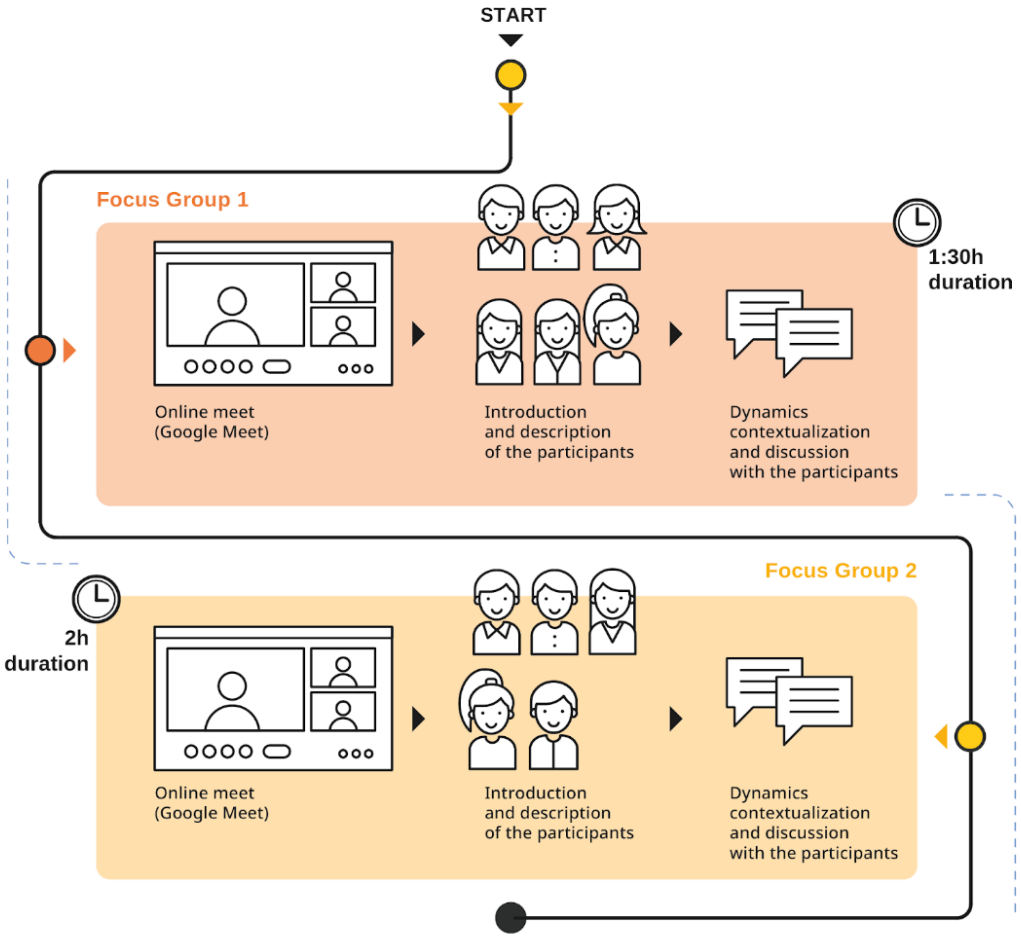


Figure 2 Infographic illustrating the focal groups.

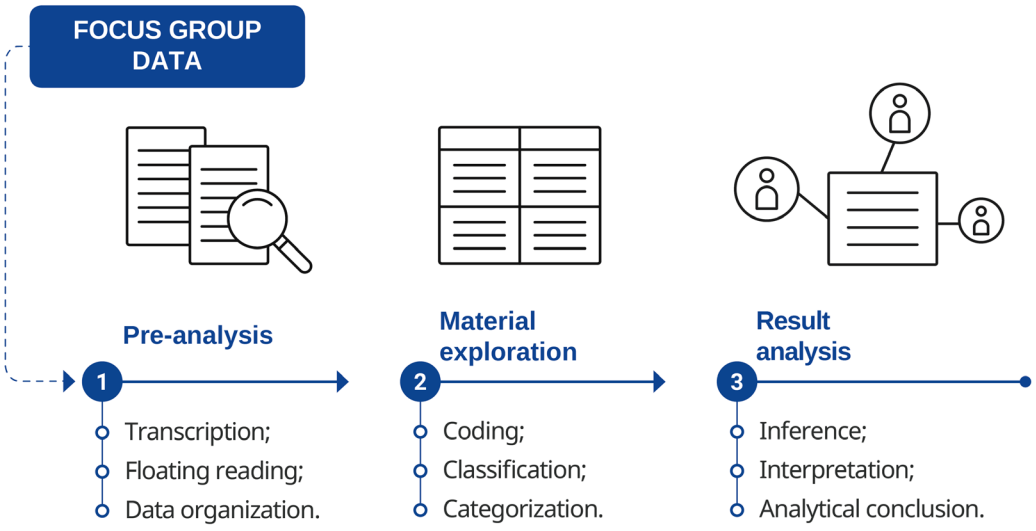


Figure 3 Thematic content analysis. Source: Adapted from Bardin (2016).

Following the material exploration, a synoptic table (Table 2) was elaborated, structured around the following topics: (1) category and its definition; (2) themes identified within each category; and (3) conclusions derived from the participants' responses.

Table 2 Synoptic table of participants' verbalizations. (Continued)

Category/Concept	Themes	Conclusion
Knowledge about student assistance Student assistance is a policy designed to address the individual and educational needs of students, especially those facing social vulnerability. It aims to promote equal opportunities by offering essential resources that support students' retention and completion of higher education. Within this framework, the university implements a range of support initiatives and financial aid programs.	• Comprehension of student assistance programs • Awareness of available support services	Although the university has made efforts to disseminate information, awareness of student assistance and support services remains limited, resulting in low engagement and underutilization – an ongoing challenge in public institutions.
Barriers to information access and utilization Communication breakdowns generate informational barriers, including disorganized content, low usability, lack of content hierarchy, and insufficient accessible language and resources.	• Accessing and comprehending information	Informational barriers arise from outdated websites, restricted navigation, limited accessibility, and unintuitive organization, among other factors, all of which hinder effective access to and use of information.
Product relevance The importance of the communication product is emphasized as a tool for publicizing student support services and democratizing access across the university community.	• Importance, visual appeal, and informational interest	Creating accessible communication products is crucial. A multiformat guide that uses inclusive language, and accessible resources should be made available through various platforms and formats to ensure broad access to information. The guide should be visually engaging, well-structured, and aesthetically functional – encouraging interactivity, dynamism, and a strong sense of identity for diverse audiences.
Information content organization Organizing information in an accessible communication product aims to facilitate the user's ability to locate, retrieve, and use information based on their specific needs.	• Information structuring	Considering the large volume of information and the challenges in accessing it, the guide should offer content that is both detailed and concise, presented clearly. To ensure accessibility, it's essential to use inclusive language, user-friendly design, and appropriate technology.
Project proposal A set of systematically planned elements designed to create a communication product that meets users' individual needs. This process involves identifying problems, proposing solutions, and innovating in graphic design. Accessibility is key to ensuring a positive and inclusive user experience.	• Language, interface, and format • Graphic design • Accessibility markers	The product must be accessible to a wide range of users by employing various formats, languages, and accessibility features. It should be disseminated through multiple channels to foster user autonomy. The graphic design must ensure equitable, flexible, simple, intuitive, and responsive use, with easily understandable information. Including symbols to denote available languages and accessibility resources is crucial.

Table 2 Synoptic table of participants' verbalizations. (Conclusion)

Category/Concept	Themes	Conclusion
Production Refers to the layout and accessibility features developed in collaboration with university partners, leading to the final delivery to the community.	• Translation and interpretation in Brazilian Sign Language (Libras)[1] • Subtitling for the deaf and hard-of-hearing • Audio description • Audiotext • Image descriptions • Plain language • Braille transcription	In addition to technical requirements, it is crucial to consider user preferences, allowing them to toggle features on or off as needed.[2]
Information management Involves tasks related to updating, storing, organizing, protecting, disseminating, and ensuring effective sharing of information.	• Storage and platform • Updating • Dissemination and sharing	Information must be regularly updated, reviewed, reinterpreted, or corrected over time. To reduce communication noise, a dedicated management team is essential. Enhancing accessibility in institutional documents and webpages – which serve as the guide's primary information sources – is also critical.

1 Brazilian Sign Language (Libras) is the primary language of the Deaf communities in Brazil, distinguished by its unique grammatical structure and conveyed through gestures, facial expressions, and body movements (Quadros & Karnopp, 2007).

2 The pilot version of the multiformat guide incorporates several accessibility features, including Brazilian Sign Language translation and interpretation (Libras window), subtitling for deaf and hard-of-hearing individuals, audio descriptions, and image descriptions. Additional resources and formats will be developed in future editions.

The results presented in Table 2 revealed that, despite the wide range of student support services available, there is a notable disconnect in how this information is sought, received, and shared, resulting in communication barriers. These key barriers were identified and systematized in Figure 4.

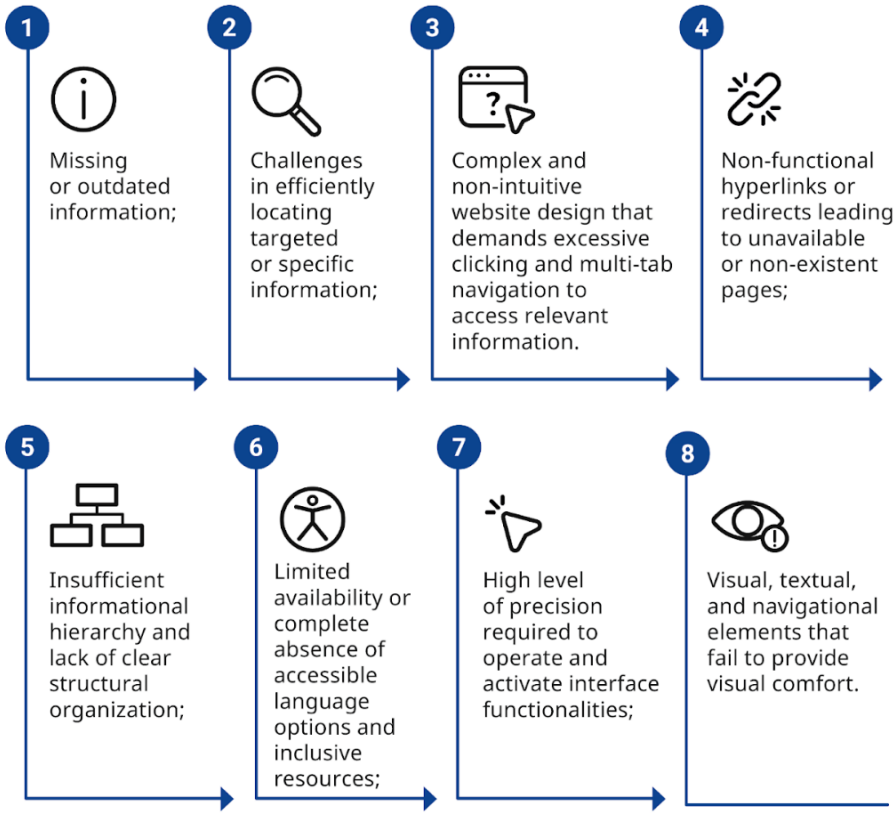


Figure 4 Main identified barriers.

During the visual research phase on technologies for producing accessible documents, it was noted that Adobe InDesign® is seldom referenced in literature. This may be due to its predominant use by design and communication professionals and the requirement of a paid license, which may limit its broader adoption. However, Adobe InDesign® offers advanced features that extend beyond standard layout functions, enabling the development of innovative, interactive, and responsive digital documents with enhanced accessibility. For this reason, it was selected to produce the multiformat guide, while Adobe Acrobat® was employed to assist in the guide's preliminary presentation.

Beyond layout software, general guidelines for developing accessible digital materials were also reviewed – guidelines applicable regardless of the specific tools used in production. Key recommendations were drawn from Garcia (2022), Bueno et al. (2022), Lima et al. (2021), Brazil (2020), and Salton et al. (2017), whose contributions proved particularly relevant to this project. Considering that digital books or documents also function as user interfaces, as Dionisio (2016) noted, they must adhere to ergonomic principles grounded in Human-Computer Interaction (HCI).[3]

3 Human-Computer Interaction is an approach that prioritizes the interaction between people and technologies, emphasizing the active participation of the user in the process (Barbosa et al., 2021).

Although HCI was not the primary focus of this study, ergonomic principles were nonetheless integrated into the guide's graphic design. These were informed by the work of Bamam (2017), Cybis et al. (2017), Lupton (2015), and Preece et al. (2005), thereby reinforcing a user-centered approach to design.

The empirical findings from the focus group dynamics, together with evidence from the scoping review by Santos (2023) and the unsystematic literature review by Nascimento (2023), contributed to defining the requirements for the informational content and graphic design of the multiformat guide (Table 3). These requirements were classified into three categories: (1) essential – critical to product development; (2) desirable – beneficial but not detrimental to usability or quality if absent; and (3) optional – suitable for future enhancements without impacting core functionality. It is important to emphasize that this list of requirements reflects the specific context of this study and should not be regarded as a universal guideline for accessible graphic design projects without considering the intended audience and content type.

Table 3 Project requirements list. (Continued)

Informational content	
Essential	I) Provide clarity, objectivity, and conciseness in the information. II) Organize content into macro informational categories, such as student assistance, academic mobility, inclusion, accessibility, among others. III) Create macro categories subdivided into: what it is, who has access, what actions are offered, how to obtain information, and what the contact details are.
Desirable	I) Consolidate information about student support services in one central location. II) Simplify the process of finding information.
Optional	I) Review and update the informational content.

Table 3 Project requirements list. (Conclusion)

Graphic design	
Essential	i) Make it accessible for screen readers. ii) Provide alternative text to describe images, symbols, graphs, infographics, and tables. iii) Offer access to a Brazilian Sign Language (Libras) window through a link or button. iv) Apply UFRN's visual identity. v) Indicate accessibility symbols. vi) Consider the principles of ergonomics, usability, attractiveness, responsiveness, and accessibility.
Desirable	i) Incorporate navigation and interaction features within the material (e.g., hyperlinked table of contents, buttons, image zoom, etc.). ii) Add links to external resources within the document. iii) Ensure a comfortable reading experience on both desktop and mobile devices. iv) Use sans-serif fonts. v) Limit text to 45 to 75 characters per line. vi) Standardize information throughout the material. vii) Consider diverse formats, such as braille printing and audiotext).
Optional	i) Use visual elements, such as photos, illustrations, and icons. ii) Integrate the Libras window directly into the document, ensuring it always stays visible. iii) Export a final lightweight file, under 20 megabytes. iv) Create infographics to illustrate visual information.

In the macro phase of the preliminary design, a co-creation tool was applied in a face-to-face setting (Figure 5) to explore participants' experiences and knowledge bases, aiming to drive innovation in the development of the multiformat guide. Co-creation is grounded in activities that foster a creative and collaborative environment (Lupton, 2013). The researcher plays a key role in facilitating this process – intervening when needed, but without constraining the participants' expression.

At this stage, participants analyzed accessible informational materials using five visual cards (Figure 6), which acted as prompts to help identify possible languages and accessibility features for the development of the multiformat guide. Each card was introduced at a different point in the session, focusing on a specific aspect of the project.

Drawing from the data gathered during the co-creation process, participants' verbalizations were systematically categorized into seven thematic groups, as outlined in Table 4.

Analyzing the data collected during the co-creation process indicated a clear preference for platforms that provide greater responsiveness across various screen sizes. This insight had already emerged in previous focus groups. Among fixed formats, PDF was identified as the most suitable, provided it incorporates accessibility, interactivity, and usability features.

Participants also raised concerns about the guide's availability in different formats. They favored the option of offering separate files, each designed for a specific language and/or accessibility feature, organized within a centralized platform such as a website. This approach would enable users to autonomously choose the format that best meets their conditions and/or needs rather than embedding all versions into a single document.

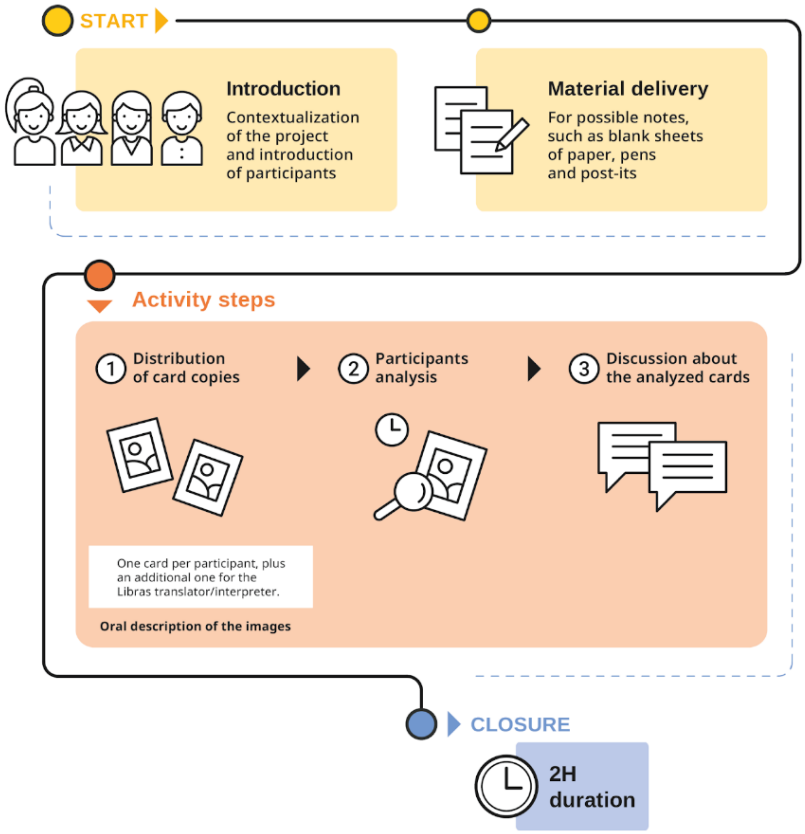
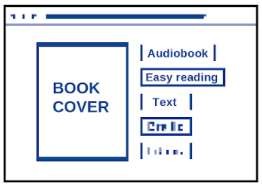


Figure 5 Infographic illustrating the co-creation tool.

First Card:

To examine participants' perceptions regarding the use of resources such as an embedded Libras (Brazilian Sign Language) window within the document, its functional effectiveness, and the use of the icon representing Brazilian Sign Language.

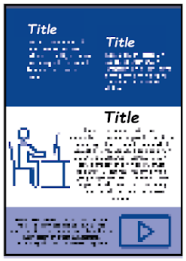


Second Card:

To elicit participants' opinions on the provision of content in separate formats, yet organized within a unified digital environment, in order to evaluate the appropriateness of this approach.

Third Card:

To explore participants' perceptions regarding the use of images or illustrations and the manner in which their accompanying descriptions are presented within the document.



Fourth and Fifth Cards:

To evaluate participants' preferences between materials presented in a clearer and more concise format and those containing a greater volume of visual and textual information.

Figure 6 Example of visual prompt cards.

Table 4 Summary of the information gathered during the co-creation process.

Platforms and formats	• Provide the widest possible range of formats to ensure inclusion and accessibility. • PDF is considered the most reliable format, particularly regarding layout consistency. • Given the increased use of mobile devices, it is essential to consider legibility across different screen types. • A responsive format may be more suitable for mobile devices.
Brazilian Sign Language (Libras) window	• The Libras window should be carefully positioned in digital documents, especially in responsive layouts. • Use the Libras window for short segments of content to reduce video duration and enhance accessibility. • Include a clear indicator linking each video to the corresponding section or paragraph. • Consider visual aspects in video production, such as standardization and color contrast, to improve accessibility for people with low vision. • Prioritize the use of a professional Libras translator/interpreter in the videos. • The VLibras[4] software is a limited accessibility tool, as it lacks the visual and expressive richness of human-mediated Libras communication.
Subtitling for the deaf and hard-of-hearing (SDH)	• The use of SDH in combination with the Libras window should be carefully considered, as it is a matter of personal preference and may result in overlapping information, unclear translations, and inconsistencies in messaging, since Libras can be translated either literally or culturally. • Offering the option to enable or disable subtitling alongside Libras translation may be more effective. • Providing separate videos – one with Libras and oral presentation, and another with SDH – can be a viable alternative.
Audio description and image description	• Preference for visible descriptions to promote accessibility and raise audience awareness. • Accessibility symbols, such as those for Libras translation/interpretation, should be described. • Information about accessibility symbols that function as links to the Libras window should also be described.
Visual resources	• Charts and infographics require special attention to accessibility. • In Libras translation, visual information should be positioned close to the interpreter. • The Libras symbol should be placed as close as possible to the information being translated/interpreted. • For detailed images and figures, it is ideal to offer a zoom-in or enlargement option.
Usability and layout design	• Follow digital accessibility guidelines such as sufficient color contrast and sans-serif typography to enhance readability and visual comfort. • Use simplified language to facilitate comprehension. • There is no consensus on the ideal use of footnotes: some participants prefer them to appear on the same page, while others favor a list of notes at the end of the document.
Availability and sharing	• Making content available in different formats reduces information loss and facilitates access and dissemination. • When offering multiple formats separately, it is important to include a visual indicator, and a clear description of the formats provided.

4 The VLibras suite is a set of digital tools freely provided by the Brazilian government. It translates digital content into Brazilian Sign Language (Libras) with the aim of making digital devices and platforms accessible to deaf and hard-of-hearing individuals. VLibras does not replace a human interpreter (Brasil, 2023).

Regarding the use of Assistive Technologies, there was a shared understanding that these tools must be applied carefully, as their effectiveness often depends on user preferences and remains subject to ongoing debate. For subtitling aimed at deaf and hard-of-hearing users, participants recommended that subtitles align with Deaf Culture and not be obligatorily combined with a Brazilian Sign Language (Libras) interpretation window. Instead, users should have the option to enable or disable subtitles. For best practices involving Libras window, participants suggested incorporating short videos that present small segments of the guide's content, accessible through buttons or links embedded in the document.

In discussing the description of visual elements – such as images, tables, and infographics – participants preferred visible textual descriptions to help raise awareness about digital accessibility. They also emphasized the importance of clearly displaying icons and symbols to facilitate internal and external navigation within the document.

The insights from the co-creation process proved instrumental in advancing to the next project phase: the development of a preliminary model of the multiformat guide (Figures 7 and 8). The consistency between findings from focus groups, visual research, and co-creation tools allowed for establishing essential accessibility and ergonomic guidelines. Ultimately, the project should prioritize a product that is easy to read, highly usable, intuitively structured, and accessible to the broadest possible audience.

Figure 7 Preliminary model of the multiformat guide (in Portuguese).

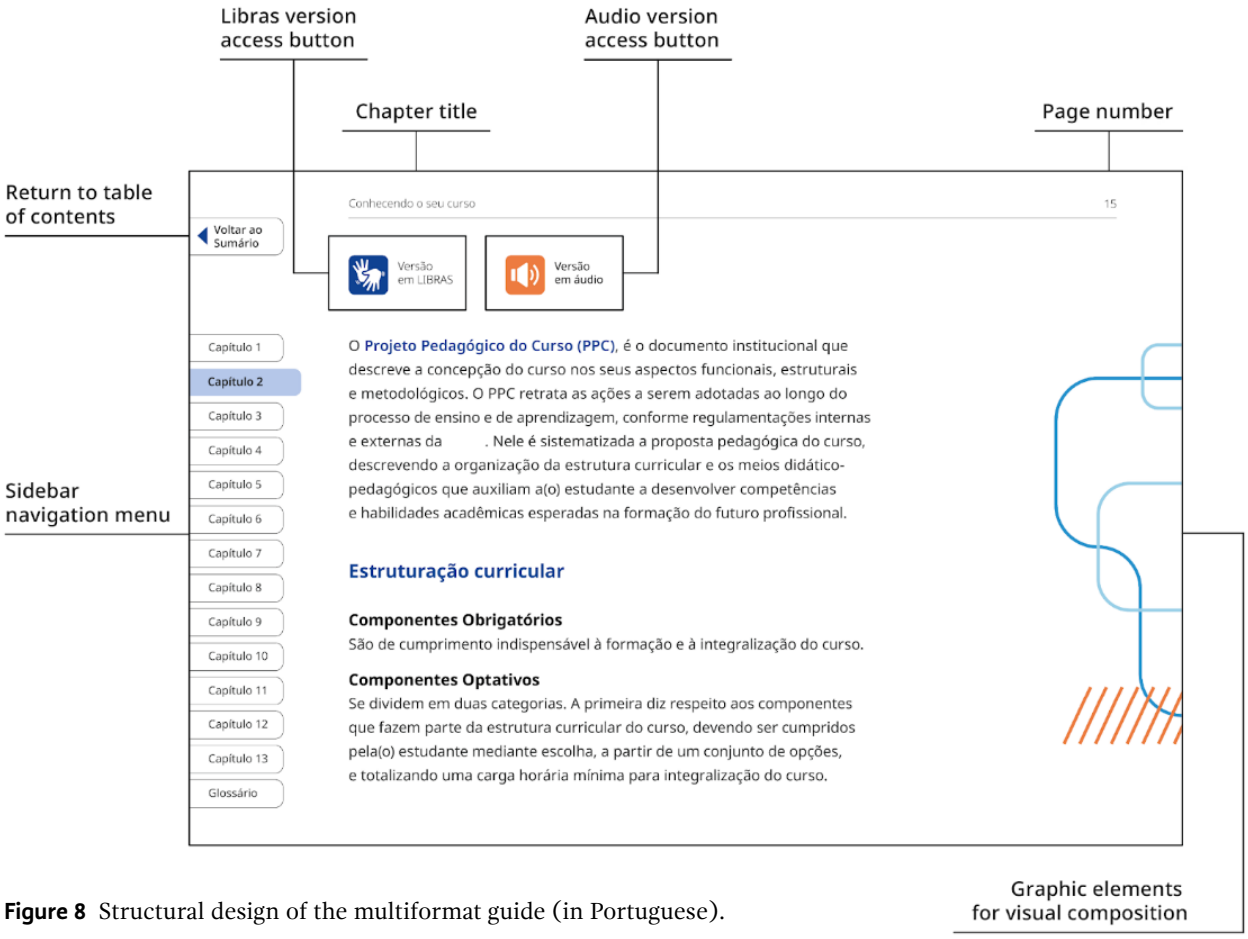


Figure 8 Structural design of the multiformat guide (in Portuguese).

4 Conclusions

In conclusion, the empirical data gathered throughout the macro and micro phases of the project – combined with supporting scientific evidence – proved sufficient for the development of a preliminary model of the multiformat guide. This research facilitated: (1) the definition of the central research problem; (2) the collection and analysis of relevant data, materials, and technologies; (3) the identification of best practices in the design of communication products, particularly regarding accessibility, usability, efficiency, appropriateness, and quality; and (4) the proposal of feasible solutions to reduce communication barriers related to accessing and disseminating information about student support services at UFRN.

Given the complexity involved in designing a multiformat publication aimed at a diverse audience, including Assistive Technology specialists and individuals with disabilities – such as those with low vision, blindness, and deafness – proved essential in identifying critical elements for establishing project requirements and parameters. The adoption of an inclusive design approach demands the integration of different research sources. Beyond scientifically grounded insights, participants contributed practical solutions drawn from lived experience – often absent from published works.

The guide presented in this article is currently in the final stages of project development. Future research will involve social validation of the medium-fidelity model and adaptation of informational content using Plain Language techniques. In the subsequent phases, the guide will incorporate the planned accessibility resources and formats, followed by an additional round of usability testing.

References

Bamam, C. (2017). *Design de livros didáticos digitais: considerações centradas no usuário*. Natal: IFRN. http://memoria.ifrn.edu.br/handle/1044/1502

Barbosa, S. D. J., Silva, B. S., Silveira, M. S., Gasparini, I., Darin, T., & Barbosa, G. D. J. (2021). *Interação humano-computador e experiência do usuário*. Natal: IFRN.

Bardin, L. (2016). *Análise de conteúdo*. São Paulo: Edições 70.

Bonsiepe, G., Kellner, P., & Holger, P. (1984). *Metodologia experimental: Desenho industrial*. Brasília, CNPq/Coordenação Editorial.

Brasil. (2020). Tribunal de Contas da União. *Criando documentos digitais acessíveis*. Brasília: TCU, Secretaria-Geral de Controle Externo (Segecex).

Brasil. (2023). Ministério da Gestão e Inovação em Serviços Públicos. *VLibras: Tradução automática para tornar a Web mais acessível*. Brasília: MGISP.

Borelli, V. R., Furlanetto, L. M. P., & Bald, R. M. (2021) Comunicação inclusiva: Desenvolvendo acessibilidade na rotina de produção de uma revista de laboratório. *Anuario Electrónico de Estudios en Comunicación Social "Disertaciones"*, *15*(1), 1–13.

Bueno, J., Lima, C. R., Sanches, E. C. P., & Reque, M. (2022). *Guia de recomendações para o desenvolvimento de materiais didáticos digitais para o público de baixa visão*. Curitiba: PPGDesign/UFPR.

Cybis, W., Betiol, A. H., & Faust, R. (2015). *Ergonomia e usabilidade: Conhecimentos, métodos e aplicações*. Porto Alegre: Novatec.

Dionisio, J. S. (2016). *Estudo ergonômico da interface de livros-texto digitais da editora da Universidade Federal de Pernambuco* [Dissertação de mestrado, Universidade Federal de Pernambuco]. Repositório Digital da UFPE. https://repositorio.ufpe.br/handle/123456789/23396

Garcia, E. S. F. (2022). *Manual de acessibilidade: Orientação básica de acessibilidade para diagramador aplicar no InDesign e para ilustrador na produção de imagem*. Natal, RN. Apresentação em PDF, 13 slides. Apresentação realizada por consultores da SEDIS, para a disciplina de Design Inclusivo e Artefatos Gráficos do bacharelado em Design da UFRN.

Gomes, D., & Quaresma, M. (2017). O Design Inclusivo no Brasil: Seu ensino nos cursos de graduação em Design [Número especial]. *Ergodesign & HCI*, 5, 86–104.

Grilo, A., Rodrigues, L. A., & Silva, B. S. (2019). Design Inclusivo e Acessibilidade Digital para surdos em páginas web: Um estudo qualitativo em universidade pública brasileira. *Design e Tecnologia*, *9*(18), 71–83. https://doi.org/10.23972/det2019iss18pp71-83

Lima, C., Azevêdo, J., Medeiros, L., Medeiros, R., & Elali, G. A. (2021). *Guia de acessibilidade para autores de artigos: CIDI + CONGIC 2021*. 10º Congresso Internacional de Design da Informação. Curitiba: UFPR.

Lupton, E. (2013). *Intuição, ação e criação: Graphic design thinking*. São Paulo: Gustavo Gili.

Lupton, E. (2015). *Tipos na tela*. São Paulo: Gustavo Gili.

Mayer, F. (2011). A re-desterritorialização do cinema na áudio-descrição. *Revista Brasileira de Tradução Visual*, *8*.

Mayer, D. B. (2019). *Leitura para além de palavras: Identificando elementos de tradução de texto em imagem nos livros com Comunicação Alternativa produzidos no Brasil, Portugal e Itália* [Trabalho de conclusão de curso de graduação, Universidade Federal do Rio Grande do Sul]. Repositório Digital da UFRGS. http://hdl.handle.net/10183/206727

Melendez, S. (2021). El lugar de la lengua de señas como lengua minoritaria en la Accesibilidad Comunicativa Universal. *Anuario Electrónico de Estudios en Comunicación Social "Disertaciones"*, *15*(1), 1–21.

Monteiro, F. V.; & Fernandes, E. M. (2022). A educação inclusiva como periférica para a pessoa com deficiência visual. *Periferia*, *14*(1), 53–71.

Munari, B. (1981). *Das coisas nascem coisas*. Lisboa: Edições 70.

Nascimento, E. T. (2023). *Projeto gráfico inclusivo para elaboração do guia multiformato sobre assistência estudantil da Universidade Federal do Rio Grande do Norte* [Trabalho de conclusão de curso de graduação, Universidade Federal do Rio Grande do Norte]. Repositório Institucional UFRN. https://repositorio.ufrn.br/handle/123456789/53853

Preece, J., Rogers, & Y., Sharp, H. (2005). *Design de interação: Além da interação homem computador*. São Paulo: Bookman.

Quadros, R. M. D., & Becker Karnopp, L. (2007). *Língua de sinais brasileira: Estudos linguísticos*. São Paulo: Artmed.

Salton, B. P., Agnol, A. D., & Turcatti, A. (2017). *Manual de acessibilidade em documentos digitais*. Bento Gonçalves: Instituto Federal de Educação, Ciência e Tecnologia do Rio Grande do Sul.

Santos, A. R. R. (2023). *Os recursos de acessibilidade comunicacional e a eficácia do processo de comunicação formal no ensino superior: Proposição de guia multiformato* [Dissertação de mestrado, Universidade Federal do Rio Grande do Norte]. Repositório Institucional UFRN. https://repositorio.ufrn.br/handle/123456789/55883

Santos, A. R. R., Romani, E., & Nunes Sobrinho, F. P. (2025). Linguagens e recursos de acessibilidade comunicacional na eficácia do processo de comunicação: Uma revisão de escopo. *Revista Brasileira de Educação Especial*, *31*, e0161.

Salasar, D. N. (2019). *Um museu para todos: Manual para programa de acessibilidade*. Pelotas: Ed. UFPel.

Salton, B. P., Dall Agnol, A., & Turcatti, A. (2017). *Manual de acessibilidade em documentos digitais*. Bento Gonçalves: Instituto Federal de Educação, Ciência e Tecnologia do Rio Grande do Sul.

Sassaki, R. K. (2007). Nada sobre nós sem nós: Da integração à inclusão – Parte 1. *Revista Nacional de Reabilitação*, *57*, 8–16.

Sassaki, R. K. (2007). Nada sobre nós, sem nós: Da integração à inclusão – Parte 2. *Revista Nacional de Reabilitação*, *58*, 20–30.

Sassaki, R. K. (2009). Inclusão: Acessibilidade no lazer, trabalho e educação. *Revista Nacional de Reabilitação*, ano XII, 10–16.

Sarraf, V. P. (2018). Acessibilidade cultural para pessoas com deficiência: Benefícios para todos. *Revista do Centro de Pesquisa e Formação*, *6*, 23–43.

Sousa, C. (2018). *Projeto de leitura inclusiva partilhada*. Instituto Politécnico de Leiria. Apresentação em PDF, 21 slides. Apresentação do III Encontro sobre Inclusão em Contexto Escolar. Rumo a uma escola inclusiva de 2ª geração. Escola Superior de Educação e Ciências Sociais do Instituto Politécnico de Leiria.

Souza, A. (2021). Design universal e Design inclusivo: Transformações para uma nova aplicação. *Revista Transverso*, *2*, 21–37.

Torres, E., Manzonni, A., & Mello, A. (2007). Nem toda pessoa cega lê em Braille nem toda pessoa surda se comunica em língua de sinais. *Educação e Pesquisa*, *33*(2), 369–385. https://doi.org/10.1590/S1517-97022007000200013

Verhine, A. (2020). Ruídos na Comunicação vs. Transparência na Administração Pública Brasileira. *Anais da XVII Semana de Análise Regional e Urbana (SARU) – O Urbano e o Regional*: Planejamento e Políticas Públicas no Brasil no Século XXI. Salvador: UNIFACS. pp. 770–792.

About the authors

Ana Rita Rodrigues dos Santos
ana.rodrigues@ufrn.br
Universidade Federal do Rio Grande do Norte
Natal, RN

Elizabeth Romani
elizabeth.romani@ufrn.br
Universidade Federal do Rio Grande do Norte
Natal, RN

Francisco de Paula Nunes Sobrinho
fnunessobrinho@yahoo.com.br
Universidade do Estado do Rio de Janeiro
Rio de Janeiro, RJ

Eriadne Teixeira do Nascimento
eritn89@gmail.com
Natal, RN

Submission date/*Artigo recebido em*: 29/9/2024
Approvement date/*Artigo aprovado em*: 1/9/2025