Research Article

Curation of accessible digital objects in the Brazilian Network of Studies and Adapted Collections - REBECA

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RESUMO

Introduction: From the constant and staggered production of Accessible Digital Objects, the concern with their digital management and preservation emerges, to avoid losses and guarantee long-term access to them. Objective: The research described in this article sought to identify Digital Curation actions being implemented by the Institutions that are part of the Brazilian Network of Studies and Adapted Collections (REBECA). Methodology: As for the methodological procedures, it was characterized as descriptive research, with a quantitative and qualitative approach. As a data collection instrument, a questionnaire was applied, with seventeen questions, elaborated based on the DCC&U digital curation lifecycle model. Results: It was found that curatorship or digital preservation actions are not performed uniformly across the Network. However, although there is no standardization, all actions that are configured as stages of the digital curation life cycle were identified in at least one HEI, the most frequent being: community participation and monitoring and the description and representation of information, through the specification and attribution of metadata to the produced accessible digital objects. Conclusion: Digital curation and preservation are still emerging issues in the Network's discussions, even though many of the actions present in the curatorship lifecycle models are already carried out in the production process of Accessible Digital Objects.

KEYWORDS

Digital curation. Accessible digital objects. Informational accessibility. Lifecycle model. REBECA Network.

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Curadoria de objetos digitais acessíveis na Rede Brasileira de Estudos e Acervos Adaptados - REBECA

ABSTRACT

Introdução: Da produção constante e escalonada de Objetos Digitais Acessíveis emerge a preocupação com a gestão e preservação digital destes, de forma a evitar perdas e garantir o acesso a longo prazo a eles. Objetivo: A pesquisa descrita neste artigo buscou identificar ações de Curadoria Digital que estejam sendo implementadas pelas Instituições integrantes da Rede Brasileira de Estudos e Acervos Adaptados (REBECA). Metodologia: Quanto aos procedimentos metodológicos, caracterizou-se como uma pesquisa descritiva, com abordagem quantitativa e qualitativa. Como instrumento de coleta de dados, foi aplicado um questionário, com dezessete questões, elaborado com base no modelo de ciclo de vida para curadoria digital DCC&U. Resultados:

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Verificou-se que as ações de curadoria ou de preservação digital não são executadas de maneira uniforme na Rede. Porém, apesar de não haver uma padronização, todas as ações que se configuram como etapas do ciclo de vida da curadoria digital foram identificadas em pelo menos uma IES, sendo as mais frequentes: a participação e monitoramento da comunidade e a descrição e representação da informação, por meio da especificação e atribuição de metadados aos objetos digitais acessíveis produzidos. Conclusão: A curadoria e preservação digital são ainda assuntos emergentes nas discussões da Rede, apesar de muitas das ações presentes nos modelos de ciclo de vida de curadoria já serem realizadas no processo de produção dos Objetos Digitais Acessíveis.

PALAVRAS-CHAVE
Curadoria digital. Objetos digitais acessíveis. Acessibilidade informacional. Modelo de ciclo de vida. Rede REBECA.

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1 INTRODUCTION

The provision and management of information in an accessible format has become increasingly necessary in Brazilian university libraries, as more people with disabilities have gained access to Higher Education Institutions (HEIs).

According to data from the latest census by the Brazilian Institute of Geography and Statistics (Instituto Brasileiro de Geografia e Estatística, 2010), Brazil has around 24% of its population made up of people with disabilities. And, according to data from the INEP census (Brazil, 2022), there was an increase between 2010 and 2020 in the enrollment of students with disabilities, global development disorders, or high abilities in HEIs. The figures show a rise, from 19,869 (nineteen thousand, eight hundred and sixty-nine) enrollments in 2010 to 55,829 (fifty-five thousand, eight hundred and twenty-nine) enrollments in 2020.

This growth is mostly due to compliance with public inclusion policies and the relevant legislation, including Law 13.409/2016, known as the Inclusion Law (Brasil, 2016), which was amended by Decree 9.034/2017 (Brasil, 2017), which changes the rules of the quota program for Federal Institutes and Universities and includes people with disabilities in the list of students entitled to reserved places at these institutions. However, it is clear that it is not enough to provide access to higher education, but rather an inclusive educational environment. From this, it can be inferred that university libraries, within this framework, must have an inclusive attitude in their products, services, and practices, considering the needs of the target audience with disabilities. In this way, libraries must be prepared and able to adequately welcome all users, regardless of their physical and sensory differences.

The focus on informational accessibility requires the librarian to behave inclusively and goes back to the preeminent challenges of Ranganathan's second law "to each reader his book" (Figueiredo, 1992), elucidating that the information professional must observe the clientele to prepare accessible collections for all user segments. This is endorsed by NBR 9050, which states that "Libraries must guarantee audiovisual resources, publications in accessible digital text and support services, as defined in specific legislation" (Associação Brasileira de Normas Técnicas, 2020, p.136).

In this context, Accessible Digital Object (ADO) is the nomenclature used in this research to refer to information documents in accessible formats, which contain adaptive elements assigned to them. These ADOs are created from the works that make up the basic and complementary bibliography of courses at Higher Education Institutions (HEIs) and are used in the teaching and learning process of people with visual impairments, including people with blindness and low vision, as well as people who have difficulty accessing printed text and are often the main form of access to academic content for these students.

Promoting the creation of ADO is in line with Fujino's (2017) point that, in the field of Information Science, accessibility is not limited to the materiality of access. It involves cognitive aspects of the user and an understanding of the social practices of information, as necessary elements to enable the development of mediations to enable access and appropriation.

Since 2017, HEIs that produce and make ADO available have been part of the Brazilian Network of Studies and Adapted Collections (REBECA), a Brazilian initiative that seeks to subsidize action in the field of digital accessibility for broad access to information. According to Melo et al. (2022, p. 260), "the main objective of REBECA is to bring together HEIs that develop the same actions and information services for visually impaired people enrolled in courses at these institutions". In addition, this cooperation avoids the transcription of items already adapted by another institution, resulting in greater efficiency and speed of access to the collections. This is important so as not to generate rework and because the disabilities that are now catered for by the network have been expanded, going beyond visual impairment, which requires a greater effort from the team involved.

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However, considering that the process of creating ADO, which involves digitization and/or inclusion of adaptive elements, with a focus on accessibility, involves effort and cost, the ADO produced by HEIs must be managed from their production to their access, use, and reuse; including their organization, management, and preservation, so that their long-term access is guaranteed, which refers to Digital Curation. Abbott (2008) conceptualizes digital curation as the long-term management and preservation of digital data and, in practice, it is carried out through life cycle models that describe actions or steps to be taken to guarantee the long-term preservation of and access to digital objects (Higgins, 2008).

Against this backdrop, the research described in this article sought to identify Digital Curation actions being implemented by the member institutions of the Brazilian Network of Studies and Adapted Collections (REBECA) to manage and preserve their collections. For this purpose, it was based on the structure of the DCC&U Life Cycle Model (Constantopoulos et al., 2009), both to structure data collection and to analyze the curatorial actions identified in the Network.

This research both contributes to reflections on the relevance of adapted digital objects and provides an authoritative and systematic overview of the curatorial actions undertaken by the REBECA Network member institutions. In this way, it can provoke reflections on actions that can be implemented to guarantee long-term access to and use of ADO, since they are essential for promoting equal access to information.

It should be noted that the content of this article is derived from a master's thesis that both discussed the concepts, characteristics, and particularities of ADO and established digital curation actions that should be applied to their creation, management, preservation and long-term access, in the context of the Accessibility Laboratory of the UFPE Central Library, one of the members of the REBECA Network.

2 DIGITAL CURATORSHIP AND THE DCC&U LIFE CYCLE

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For Araújo and Valentin (2019, p. 250), digital curation is "the practice and study of the processes of selecting, preserving, maintaining, collecting and archiving digital data, with the consequent creation of repositories and/or participatory digital platforms". To carry out curation in practice, lifecycle models are followed which, in general, are generic and comprehensive, customizing them to the context of the organization/institution where it will be applied.

These models include the actions or stages necessary for the process of curating and preserving digital objects (Higgins, 2008) which, in general, range from planning the curation process as a whole, through its creation and description, to its long-term storage, availability and access, always considering periodic digital preservation actions.

There are several models in the literature (Silva; Siebra, 2017), but in the context of this work, we selected the DCC&U model - The extended digital curation lifecycle model (Constantopoulos et al., 2009), which is an extension of the Digital Curation Center (DCC) model (DCC, 2022). This model has eight stages, as shown in Chart 1:

Chart 1. Stages of the DCC&U life cycle

Stages	Description
Appraisal	The development of criteria for evaluating potential resources, as well as the actual selection of resources that can be subject to subsequent curation processes.
Ingest	The process involves: a) the digital recording of image, sound, text, and data; b) digitizing analog recordings from various operators; a) c) importing digital resources from other sources, including repositories.
Classification, indexing, and cataloging	Three actions are necessary for the production of logical indexes for information management and, more importantly, subject indexes and indexes related to the intended or possible use of digital resources.
Knowledge enhancement and Community observation and participation	A process that refers to real-world entities, situations, and events represented by digital resources, their wider context and domain, and the digital resources themselves; for example, annotating documents with the entities of an ontology to which they refer, formally representing the situations or events mentioned in documents, and linking documents to other documents that support or contradict them would all be cases of knowledge enhancement.
Presentation, publication, and dissemination	Processes that include the generation of new artifacts (scientific, academic, artistic, etc.) from existing primary or secondary digital resources.
Utilization experiences	This process captures the interaction between users and resources, as well as the effects of this interaction.
Preservation	A process that aims to protect against longevity risks, arising from physical causes or due to technological developments.

Source: Prepared by the authors based on Constantopoulos et al., 2009.

This model was chosen because it explicitly addresses contextual information resources as an object of curation, encompassing a better description of the problem domain; the objectives and usage models of digital objects to better meet user needs; as well as the management of the authorities involved in the curation process. In addition, this model explicitly considers the enrichment/aggregation of knowledge to digital objects (which is relevant in the process of making material accessible); as well as considering the collection of user experience in accessing and using the objects made available, to assess the need for adjustments/improvements, aimed at better meeting the needs of the users of the objects being preserved.

These additional features of the DCC model, one of the most widely used, make it interesting due to the particularities of both ADO and the target audience served.

3 BRAZILIAN NETWORK OF ADAPTED STUDIES AND COLLECTIONS (REBECA)

The Brazilian Network of Studies and Adapted Collections (REBECA) is the first network in Brazil for technical cooperation and collaboration in the development of academic collections in accessible formats. Melo et al. (2022, p. 259) report that the Network "is a response to Brazilian and international legislation for access to information, with cooperative network actions as a possibility to maximize its resources and collections".

Currently, the REBECA Network brings together 17 (seventeen) HEIs, as listed in Table 2, which produce and supply ADO.

Chart 2. REBECA Network member institutions

Member institutions	Acronym
Instituto Federal da Paraíba	IFBP
Instituto Federal do Rio Grande do Sul	IFRES
Universidade de Brasília	UNB
Universidade Estadual da Paraíba	UEPB
Universidade Federal da Bahia	UFBA
Universidade Federal de Alagoas	UFAL
Universidade Federal de Goiás	UFG
Universidade Federal de Minas Gerais	UFMG
Universidade Federal de Pernambuco	UFPE
Universidade Federal de Santa Catarina	UFSC
Universidade Federal do Agreste de Pernambuco	UFAPE
Universidade Federal do Ceará	UFC
Universidade Federal do Pará	UFPA
Universidade Federal do Recôncavo da Bahia	UFRB
Universidade Federal do Rio Grande do Norte	UFRN
Universidade Federal do Sul e Sudeste do Pará	UNIFESSPA
Universidade Federal Rural de Pernambuco	UFRPE

Source: Rede REBECA (2022).

To develop collections in accessible formats, the institutions that constitute the REBECA Network exchange technical information and share collections to support the beneficiary academic community, belonging to the HEIs that operate the Network. This cooperation is also provided for in the Marrakech Treaty.

> [...] copies in accessible formats produced under a copyright limitation may be distributed or made available to beneficiaries or authorized entities located in another country that is a signatory to the Marrakech Treaty. In this way, an authorized entity of a contracting party can make books available in accessible formats to another authorized entity or beneficiary in a country that has acceded to the Treaty (Brazil, 2022b, p.11).

The activities are managed by six working groups, which debate and deliberate on the development of collections on specific themes, namely: communication, repositories, standardization of manuals, audio description, musicography in Braille, and mentoring (for aspiring institutions) (Melo et al., 2022). Each of the working groups (WG) developed guidelines for adapting academic texts on their agenda. These guidelines, widely discussed within each WG, are discussed at a general meeting of the Network and then validated by people with disabilities. Only then are they incorporated into the service manuals of each HEI. It should be noted that, from the very first meetings, "the importance of standardizing the format of the material and adopting standards" was stressed (Dantas, 2018, p.4).

The REBECA Network, therefore, plays a fundamental role in supporting HEIs, guiding good practices in the production, management, and provision of access to accessible information. However, just producing ADO does not guarantee long-term access for those who need it, since, like all digital content, they are subject to technological obsolescence and the fragility of the media on which they are stored. It is therefore necessary to consider and plan the creation of ADO in the context of life cycles established by digital curation so that these objects can be created, managed, preserved, and accessed in the long term, for as long as the community is interested in them.

4 METHODOLOGICAL PATH

In terms of the methodological designs employed, the objectives of this study are descriptive, with an approach that includes both quantitative and qualitative elements. According to Gil (2008), this type of research is based on outlining the particularities inherent in specific populations or circumscribed phenomena, using systematized data collection methods, including the use of a questionnaire. Bibliographical research and documentary analysis were used.

The data collection instrument used was a questionnaire with seventeen questions, based on the curation actions of the DCC&U digital curation life cycle model (Constantopoulos et al., 2009). This curation model was chosen because it more explicitly emphasizes the need to record and keep data on how the information created, managed, and preserved is used and accessed by users, through their queries and interaction (Constantopoulos et al., 2009). The questionnaire was made available online, and the HEIs were invited via e-mail to take part in the survey. It should be noted that UFPE's participation in the REBECA Network facilitated access to the contacts of the professionals responsible for ADO management at the institutions involved.

Before the survey instrument was applied, an e-mail was sent to the committee that manages the Network, informing them of the survey and requesting authorization and support to send the questionnaire to all the HEIs in the Network. After approval, a period of testing the survey instrument was carried out, sending it to two of the 17 (seventeen) HEIs in the Network, to identify possible errors and inconsistencies in the questionnaire. The test period took place between September 23 and 25, 2022. Responses and observations were received, and the instrument underwent minor adjustments.

Subsequently, the instrument was sent by e-mail to the other 15 (fifteen) HEIs in the Network. The questionnaire was available from September 27 to December 6, 2022. The thirteen HEIs that responded to the survey and therefore made up the corpus of data for the research were: IFRS, UNB, UFBA, UFAL, UFG, UFMG, UFPE, UFSC, UFAPE, UFC, UFRN, UNIFESSPA and UFRPE.

The answers obtained were organized in Excel spreadsheets. The open-ended questions, which were, therefore, easy to answer, were subjected to Bardin's (2009) content analysis. To this end, the data was systematized as follows:

a) floating reading, highlighting keywords to help define categories;
b) categorization for textual analysis of the answers based on the floating reading;
c) descriptive and reflective analysis of the data.

Once these stages had been carried out, it was possible to systematize the data and produce iconographic images showing the results of the research, which were then discussed in the light of the literature consulted. It should be noted that both the data collection and the documentary analysis of instruments drawn up on the production of ADO in some institutions helped to identify the curatorial actions carried out.

5 RESULTS OF THE REBECA NETWORK'S CURATION ACTIONS

The presentation of the results obtained will be organized into separate sections, which are aligned with the thematic framework and the research instrument used. The division will cover the following sections: Profile of Respondents; Characterization of ADO Users; and Description of Digital Curation Actions Implemented in ADOs. It is worth pointing out that these sections are in line with those in the research instrument, reinforcing the coherence and

cohesion between the data collection phase and the subsequent stages of analysis and interpretation of the results.

5.1 Profile of the Professionals

Of the 15 (fifteen) institutions that make up the REBECA Network included in the study, 13 (thirteen) responded to the survey, i.e., 86.6% of the Network's potential respondents.

Concerning the profile of the respondents, it is known that most of the professionals who make up the Network are librarians. In this survey, they accounted for 61.5% of respondents. Some professionals identified themselves as administrative technician, system director, accessibility center coordinator, center coordinators, and reference technicians, representing 7.7% of respondents each.
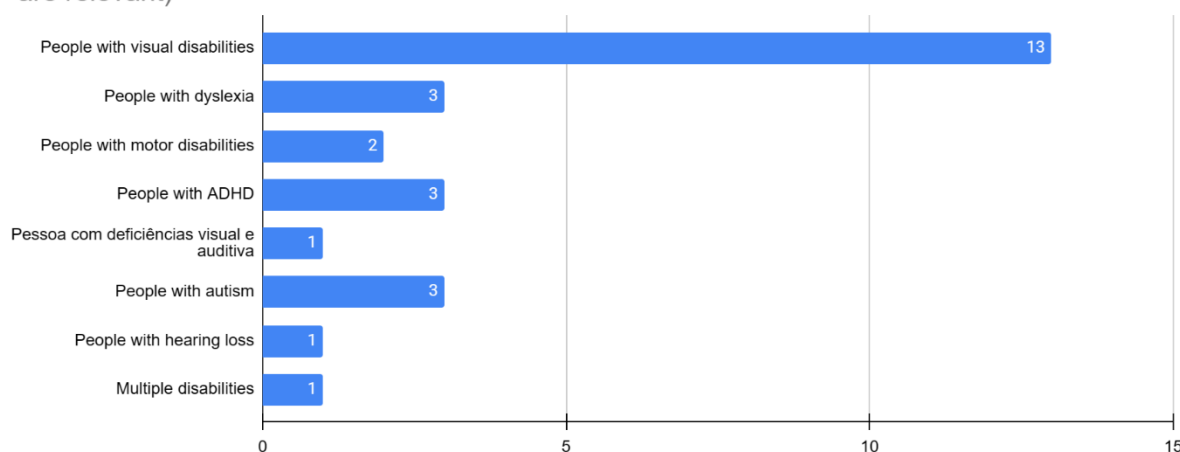
Complementing this information, the questionnaire sought how long they had been working in the position specified by the professionals. It was found that the majority of professionals had been in the job for more than three years, and 30.8% between one and three years. Therefore, they all already had some experience in their role.

5.2 Profile of Users of Accessible Digital Objects on the REBECA Network

The survey sought to identify the profile of users who are served at the Network's HEIs. The data confirms that the Network's main target audience is visually impaired people. This is because 100% of the responding HEIs cater to this specific audience. It should be noted that, in this question, the HEIs were able to tick all the options that were relevant to them. Thus, the data shows that other disabilities or disorders are catered for in lower percentages, as can be seen in Graph 1.

Graph 1. Type of disability of users served at REBECA Network HEIs

4. Which users usually access and use Accessible Digital Objects? (Check all the options that are relevant)

Source: Research data (2022)

The graph endorses the fact that the network initially only catered to people with visual impairments due to the mandatory nature of this service in Brazilian legislation, as contemplated by Law 9.610/1998 on copyright, which allows the reproduction of works "for the exclusive use of the visually impaired, whenever the reproduction, without commercial purposes, is made using the Braille system or any other procedure on any medium for these recipients" (Brazil, 1998, chapter IV, art. 46, inc. I). However, the Marrakech Treaty broadened the range of disabilities that must be catered for, thus reflecting a recent change in the profile

of the network's users. Regardless of any other disability or difficulty, people are beneficiaries of the Treaty:
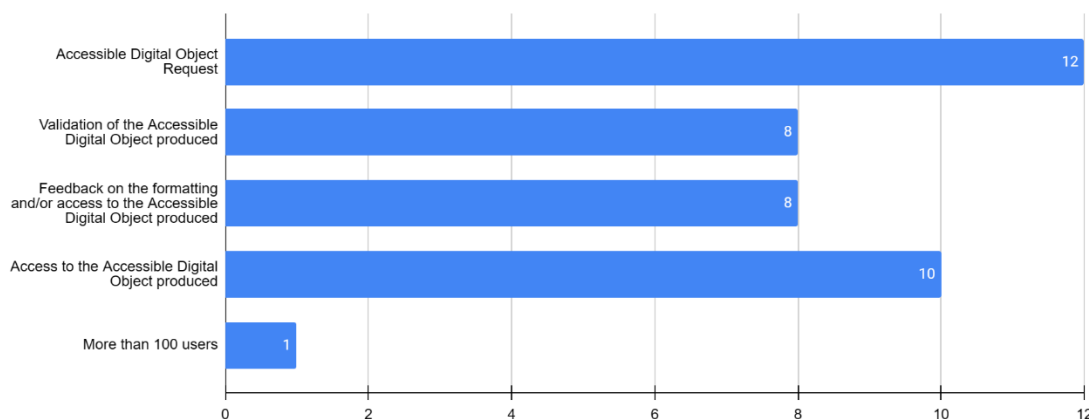
a) blind;
b) with a visual disability that cannot be corrected or for whom it is impossible to read printed material in a manner substantially equivalent to that of a person without such a disability;
c) with a perception or reading disability that is considered incorrigible, or for whom it is impossible to read printed material in a manner substantially equivalent to that of a person without such a disability; or
d) with a physical disability that makes it impossible to hold or manipulate a book, focus, or move the eyes in a manner appropriate for reading. (Brazil, 2021, Ch. I, art. 2, inc. I).

As can be seen in Graph 1, HEIs now include people with hearing disabilities (1); people with deaf blindness (1); people with motor disabilities (2); people with ADHD (3); people with autism (3); people with dyslexia (3); and people with multiple disabilities (1).

Concerning the participation of these users in the process of managing and accessing Accessible Digital Objects, the tool sought to identify the stages at which users participated, since the participation of the target community is recommended for the curation process. It should be noted that in this question, HEIs could check all the options that were relevant to them, as can be seen in Graph 2.

Graph 2. User participation in the ADO management and access process

5. In which of the following stages do users with disabilities participate in the process of managing and accessing Accessible Digital Objects? (Check all the answers that are relevant)
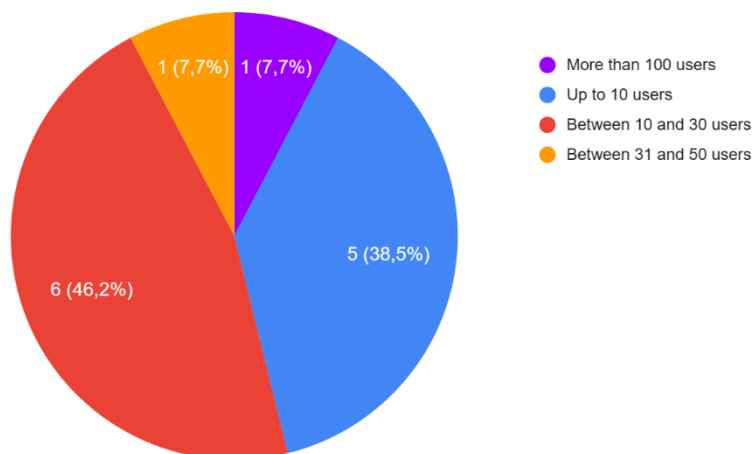
Source: Research data (2022)

According to the responses, in 12 (twelve) HEIs, or 92.3%, user participation includes requesting accessible materials; in 69.2% (9) of the HEIs, users also validate the Digital Accessible Objects produced, before they are made available; in 61.5% (8) users participate by providing feedback on the formatting and/or access to the Digital Accessible Objects produced after they have been made available; and in 76.9% (10) users participate by accessing the Digital Accessible Objects on their initiative (they do not receive the ADO directly).

From this data, it can be inferred that users participate in the ADO production and access process. It should be noted that the role of validation and feedback on the formatting carried out in the ADO creation process are important actions in the ADO lifecycle because once the adaptive elements have been inserted into the information material, it is important to assess whether they are suitable for the target audience. User participation and monitoring are provided for in the DCC&U lifecycle model, chosen in this research as the reference model for curating accessible digital objects, precisely because it explicitly considers greater interaction with users.

We also sought to find out how many users benefited from the availability of Accessible Digital Objects on the Web, based on the beneficiaries at each of the HEIs, as shown in Graph 3.

Graph 3. Users benefiting from the REBECA Network

6. How many users benefit from the availability of Accessible Digital Objects in the institution?

Source: Research data (2022)

Graph 3 shows the average number of users served: 38.5% (5) have benefited up to 10 users. 46.2% (6) have between 10 and 30 benefited users; 7.7% (1) have between 31 and 50 benefited users; and 7.7% (1) have more than 100 benefited users. Taking the data provided into account, we arrive at a potential figure of an average of 270 users reached by the REBECA Network. However, it should be noted that the trend over the coming years is for this number to increase steadily, due to two main factors: the first is the continued expansion of the public of people with disabilities due to the Marrakech Treaty, which is still having its first effects because it is so recent, and the second is the continued increase in the arrival of people with disabilities at HEIs, as a result of public accessibility policies.
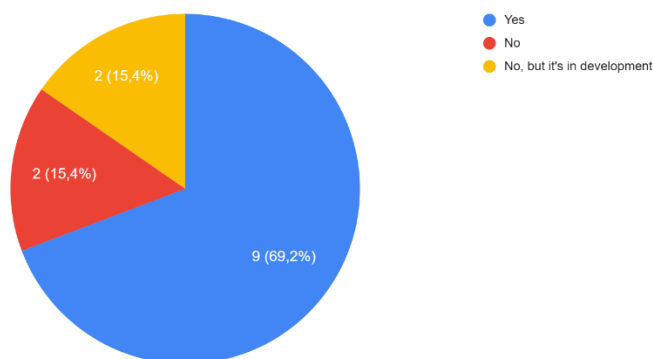
5.3 Digital Curatorship Actions in the REBECA Network

Regarding digital curation actions implemented in the Network, a block of questions was drawn up to identify actions in this direction. The first of these consisted of checking whether the institutions have guiding documents for the creation, description, management, storage, preservation, and access of Digital Accessible Objects, which is part of a plan of actions aimed at curating ADO. The answers are organized in Graph 4.

Graph 4. Users benefiting from the REBECA Network

7. Does the institution have guiding document(s) for the creation, description, management, storage, preservation and access of Accessible Digital Objects?
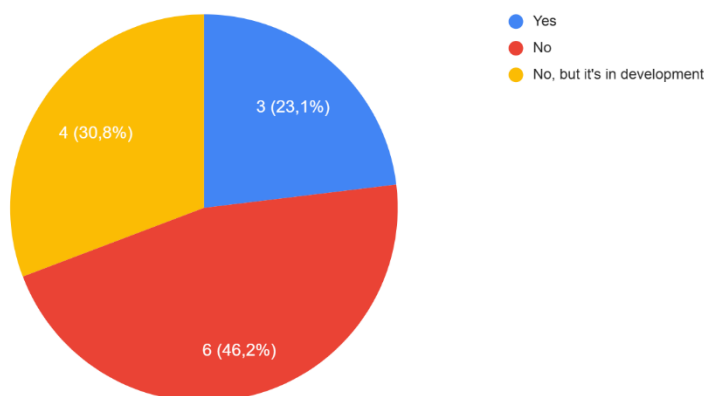

Source: Research data (2022)

The majority of HEIs (69.2%) said they had guiding documents, rather than 15.4% who said they didn't have any. A further 15.4% said that they had this document under construction. Having guiding documents is a key element in the management of ADO, both because they have particularities in the creation and access process, and so that the process as a whole is known to those involved, making it possible to standardize the actions taken. According to Siebra, Silva, and Vega (2020), developing policies, regulations, and guiding documents for all stages of the life cycle of digital objects avoids ambiguities, defines standards and responsibilities, and establishes permissions and prohibitions.

Another key document for digital curation is the digital preservation plan, which records the digital preservation strategies that will be applied, as well as guidelines relating to operational procedures for the long-term preservation of the digital collection. As can be seen in Graph 5, only 23.1% of institutions have this document. The vast majority (77%) do not yet have it, or it is still in the process of being developed, which raises concerns about long-term access to the ADO being produced. However, it can be seen both from the network's actions and from the discussions that have been taking place in the working groups that concern about digital preservation is latent, and it is an issue that has been attracting the attention of HEIs recently.

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Graph 5. Digital preservation plan in the REBECA Network

8. Does the institution have a digital preservation plan for Accessible Digital Objects?
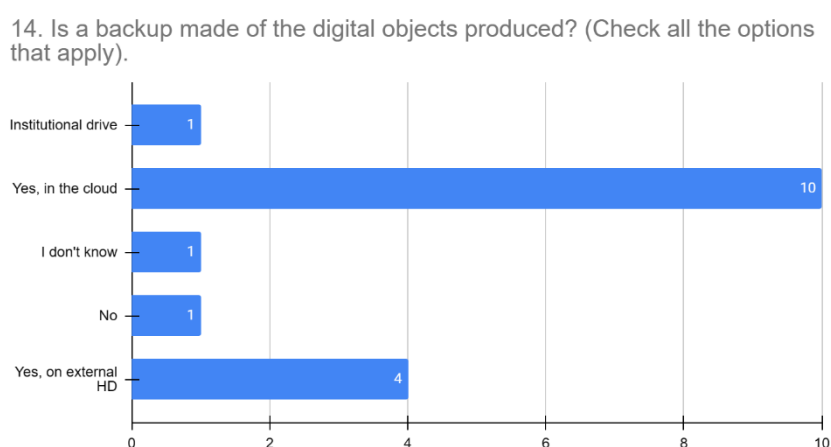

Source: Research data (2022)

Another question asked in what format digital objects are produced. In this question, HEIs could mark all the relevant items. Among the options were: PDF/A, 100%; DOCX, 76.9%; HTML, 23.1%; MP3 (Audio), 61.5%; Word Doc, 7.7%; Epub, 7.7%; video, TXT, 7.7%; and Braille and 3D printing, 7.7%. Among the formats indicated, some are proprietary formats, which are not suitable in the context of digital preservation, where the use of open formats is recommended (Baggio; Flores, 2012). It is necessary to check why some of these proprietary formats are used and assess the possibility of replacing them with equivalent open formats, to guarantee independence from the manufacturer/owner.

Still on the subject of digital management and preservation actions, the survey sought to identify whether HEIs make backup copies of the digital objects they produce, and by what means. In this question, HEIs were able to indicate all the options that were relevant to them, as can be seen in Graph 6.

Graph 6. Backups of Accessible Digital Objects.

Source: Research data (2022)

According to the responses, ten HEIs back up to the cloud (76.9%); four HEIs (30.8%) back up to an external hard drive; only one HEI (7.7%) to an institutional drive. In addition, one HEI stated that it does not carry out backups and one was unable to provide information on this action. At this point, the analysis did not address the distinction between free and paid data storage clouds. The use of the cloud deserves some reflection since free clouds often entail less responsibility for the service providers, as well as making substantially restricted amounts of space available, constituting options of limited scope for institutional use. The use of a paid cloud requires a reserved allocation of financial resources to sustain its continuity in the long term but has a more substantial commitment from the provider involved in the security of the data held in custody.

Regarding the validation of the accessible digital objects produced: 53.8% (7) of the HEIs reported that it is carried out by a disabled employee; 46.2% (6) stated that disabled users carry out the validation; 38.5% (5) are carried out by specialists; 38.5% (5) by librarians; 7.7% (1) reported that it is a translator and interpreter; 7.7% (1) by the coordinator of the production of accessible materials. One institution reported that it had not yet defined the person responsible for validating the documents.

A contradiction can be seen in the data regarding the validation of documents by users with disabilities, since previously, when asked about the participation of users in the management of ADO, nine institutions stated that users participated in the process by validating the documents, while later when asked who validated the documents, only six institutions stated that users validated the ADO. This highlights the importance of the process of validation of the ADO by people with disabilities, to guarantee its suitability and correctness.

An important stage in digital curation is the representation and description of information, which is done by assigning metadata. The use of metadata is both an important structural strategy for digital preservation (Lira; Siebra, 2021; Márdero Arellano, 2004) and contributes to contextualizing and better understanding the ADO, as well as facilitating its subsequent retrieval. Thus, three questions sought to gather information on the process of assigning metadata to the accessible digital objects of the REBECA Network.

The first question sought to find out how many HEIs were already working on assigning metadata to the ADO produced. 53.8% (7) of the HEIs reported that they assign metadata to describe ADO, while 46.2% (6) stated that they do not assign metadata to describe ADO, which may pose challenges for the long-term preservation of these objects.

For those who gave positive feedback on the assignment of metadata, we tried to verify the standards used. Six HEIs reported using the Dublin Core metadata standard and one HEI reported using the MARC21 standard. Finally, about the use of metadata, we also asked whether these HEIs had any guidance documents to guide the filling in of metadata according to the standard adopted. Only one of the seven HEIs that use metadata said it did not have any guidance documents, which is a very positive thing.

About making Accessible Digital Objects available to benefiting users, considering the access restrictions set out in Law 9.610/1998 on Copyright (Brazil, 1998) and Decree 9.533/2018 (Brazil, 2018):

- 30.8% (4) of HEIs reported that they make ADO available in a digital repository, in an accessible community and carry out access restrictions using a password;
- 23.1% (3) use an online catalog (e.g., Pergamum, Sophia, among others), and of these, only one reported that it asks for a login and password in the online catalog, through access authorization in the user's registration and via personal email. This shows a failure to comply with the legislation that requires access restrictions to be imposed;
- 7.7% (1) make accessible information available in an exclusive repository and restrict access by requesting a login and password;
- 38.4 (5) use only personal communication channels (e-mail, WhatsApp, and/or shared drive);

In addition, four (30.8%) HEIs also use personal channels (email, WhatsApp, among others), as well as a repository or catalog, diversifying the forms of availability.

At the end of the questionnaire, the HEIs answered an open question about the main challenges faced in the production, description, management, preservation, and long-term access of ADO. The data extracted was organized into thematic categories, defined by floating reading, and the answers were coded by a number drawn by lot for each HEI, not corresponding to the order in which the answers arrived.

Chart 3. Main challenges for the curation of Accessible Digital Objects.

Category	Data extraction
Financial and human resources	HEI 1: Technological and human investment and implementation of cost-effective goals for the institution and society. HEI 3: Lack of up-to-date instruments […] and having a larger team HEI 4: Availability of financial and human resources for the activity HEI 7: Lack of adequate equipment to meet demand. HEI 8: Lack of team (all stages are currently carried out by one person) HEI 13: production team with rotating fellows
Team training	HEI2: The materials are adapted by the fellows, who undergo training as soon as they join the fellowship, which includes basic notions of the office

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	suite, the construction of bibliographical references, and the description of images. However, it takes some time to consolidate this knowledge. Thus, the difficulty in producing accessible material lies in the lack of prior knowledge of the programs used for this production, such as Word for correcting and formatting texts, which requires training (for some) in the basics of the program, which also takes a lot of time. [...] the servers' inability to use Photoshop and Corel Draw, which are necessary for the production of maps and plaques, and the lack of more advanced knowledge, takes longer to produce, as a lot of research has to be done. HEI 4: understanding/confidence about the copyright involved in making accessible materials available HEI 7: staff training and adequate equipment to meet demand. HEI12: lack of trained professionals to produce accessible materials
Digital preservation	HEI2: the most difficult challenge is also preserving and accessing this material HEI 5: Digital preservation – difficulties with storage space on an internal server. HEI 11: digital preservation of ADO.
Audio description	HEI 6: description of complex images, an adaptation of Braille musicography materials HEI 9: A major challenge is describing content in the exact sciences (mathematics, physics, engineering, etc.) since it is necessary to rely on the partnership of other specialists who often need to be sensitized. HEI 10: Description of images
Digital collection management	HEI 2: the challenge is to organize it in e-mail, on the drive, and on the table, without the organization being compromised when other people access it HEI 3: Cover more formats for availability HEI 6: Establish a working methodology to get closer to the user to understand their demands, for example, adapting materials around exact sciences. Quantity and quality of work by staff to meet specific demands [...]improve routine work processes, review materials HEI 7: Collaboration between the sectors working on accessibility and the library HEI 11: Standardization of metadata
Access platform	HEI 3: Not having an accessible repository HEI 12: There is no articulation within the institution to have a repository, a centralization of access. HEI 13: develop a repository for accessible collections within the institution

Source: Prepared by the authors.

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Chart 3 shows that the challenges are diverse. Regarding attracting "**human and financial resources**", HEIs 1,3,4,7,8, and 13 indicated that the problems range from the need for up-to-date technological resources (including hardware and software) to the shortage of human resources. Two points that deserve attention and which are sometimes common situations to find, especially in public bodies, are the fact that one HEI indicated that all the activities are carried out by one person, which makes it difficult to meet demand, especially if it increases in the coming years, and to complete all the necessary steps for good ADO curation; as well as the issue of staff turnover, which is mainly made up of scholarship holders, since the scholarships have a limited periodicity. This becomes a problem because the team is always made up of apprentices, reducing the performance it could achieve over time (as it gains experience) and perhaps also limiting the quality of the ADO produced.

The limitation of human resources is reflected in another problem faced on a large scale by the HEIs in the Network, which is the constant need for **"team training"**. Firstly, because the relevant technologies and legislation are always being updated, requiring this activity to constantly update its knowledge; and secondly because a good percentage of the HEI teams are made up of scholarship holders (which, although only one HEI mentioned, is something that happens in several of them), which leads to the problem of turnover and the constant need to train newcomers.

The challenges of the "digital preservation" of ADO are also mentioned by HEIs. Many of the answers given, even those that were not highlighted, show that there is still a lack of knowledge about this issue, despite recognizing the need for it to be discussed and implemented.

As for the category referring to **"audio description"**, three HEIs (6, 9, and 10) pointed out challenges ranging from the difficulty of describing complex images to the problem of describing images from some areas of knowledge, such as the Exact Sciences, which makes it necessary to sensitize specialists to collaborate with audio description. However, it is recognized that this is not a trivial matter, as it would require the dedication of time from professionals in other areas, without remuneration or any benefit in terms of workload or points towards career progression. Currently, the need for a professional audio descriptor on teams is becoming increasingly apparent, but the lack of regulation of this profession makes it difficult for public institutions to hire this professional. It is left to the teams to seek training courses in audio-description, which end up merely remedying the lack of a qualified professional for this specific function.

The "**management of the digital collection**" was also a recurring theme among the Network's institutions. Five of the 13 HEIs addressed this issue, and among the challenges faced, HEIs 2, 3, 6, 7, and 11 revealed problems with the organization and access of e-mail, drives, and tables; the work methodology, often indicating the need to improve work routines; the need to vary digital formats to better serve the target audience; the need for collaboration between the HEI's accessibility sectors and the library; as well as the need for better standardization of metadata between the HEIs in the network, so that they can interoperate their collections. It should be noted that, currently, because most of the HEIs in the network do not have their ADO in repositories, the process of exchanging ADO ends up being manual, sent via drive or e-mail.

Finally, in the **"access platform"** category, HEIs 3, 12, and 13 expressed their concerns about access to ADO. The challenges range from the actual creation of an accessible repository to the need for coordination within the HEI to build the repository. It is well known that building and implementing a digital repository requires many resources, both financial and human, which are largely scarce in HEIs in general. The solution found by most of the HEIs that make up the Network is to make the digital collection available in a community within the institutional repository. This minimizes the problems but does not solve them. Mainly because many of the existing repositories are inaccessible, making it difficult to access ADO.

At the end of this survey, it was possible to see that among the participating HEIs, none had comprehensively implemented all the phases intrinsic to a complete digital curation cycle. However, the analysis revealed the identification of a diverse spectrum of curation actions, each of which found expression in at least one of the HEIs covered. The stages linked to monitoring and engaging the community, as well as the representation and description of information, through the systematic assignment of metadata, stand out. These practices corroborate their more widespread implementation in HEIs, providing a solid basis for optimizing curatorial processes.

In contrast to this panorama, a gap was identified in the approach to planning for the digital preservation of ADO, a dimension which, although emerging in the Network's discussions, still lacks an effective solution. Similarly, around access, use, and reuse of ADO,

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there is an incipient standardization of availability, since most of the REBECA Network makes ADO available through individual means of communication, and the access and use of resources through Repositories is notoriously limited.

Thus, there is a tangible need to focus on the spheres of digital curation and preservation within the Network. As ADO collections expand prolifically, the effort put into producing them requires safeguards to guarantee long-term availability and accessibility through the use of an appropriate platform. In this alignment between the urgency of safeguarding the ongoing production of ADO and the need to ensure its accessibility, there is a call for discussion and action, aligned with the imperative of sustaining the availability and use of ADO collections, in line with the principles of access and inclusion.

6 CONCLUSION

This study provided an insight into the operational dynamics of the REBECA Network, the majority of whose members are librarians with more than three years of experience, who demonstrate a constant dedication to technical evolution in the context of ADO management. Although they are engaged in technical debates, the research revealed an intriguing finding: although many of the practices outlined in the curation lifecycle models are already incorporated into ADO production processes, the topics of curation and digital preservation emerge only incipiently in the Network's discussions.

This instigates the need to broaden the discussions and the scope of these debates, to revisit the guidelines and normative documents in force in the Network. It is important to address crucial points to ensure the long-term management, preservation, and access of ADO, such as the definition of ideal formats that meet the open standards recommended for digital preservation; the incorporation of metadata to describe and contextualize ADO; the implementation of accessible platforms (Accessible Digital Repositories—ADR) that facilitate cooperation and interoperability between the HEIs in the Network; as well as the challenges inherent in raising financial and human resources to make collaborative efforts viable, including the demands of digital curation.

About the profile of the Network's users, the visually impaired community has solidified itself as the core target audience of the REBECA Network, occasionally expanded to include individuals with other disabilities and/or disorders. This expansion is based on the scope of the Marrakesh Treaty, which defines the beneficiaries of documents in accessible formats as all people who have difficulty accessing printed text. This delineation of the target audience, anchored in legal and humanitarian bases, establishes a significant commitment for the REBECA Network, as it directs its efforts towards expanding accessibility and inclusion, with a view to the effective dissemination of knowledge and learning in all its diversity.

This research highlights the importance of curating accessible digital objects in the Brazilian Network of Adapted Studies and Collections—REBECA, which points to a promising direction for future research, recognizing the need to improve the inclusion approach to meet the varied needs of specific groups of individuals with disabilities. In this sense, it is suggested that future work deepen the analysis by shifting the focus from "visual impairment" to encompass more specific categories such as blindness, low vision, deafness, and dyslexia. Understanding the unique demands and challenges faced by these groups will enable the production and management of even more adapted and personalized digital objects, contributing to more effective and representative inclusion in digital collections.

Furthermore, considering the constant evolution of technologies and curatorial practices, prospective research could explore how Digital Curation can adapt to future scenarios and ever-changing demands while maintaining a focus on optimizing accessibility and enhancing accessible digital collections. These research perspectives represent promising

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avenues for enriching the field of Digital Curation, contributing to the development of more effective and comprehensive strategies for managing accessible digital objects.

It is important to recognize that the research also faced limitations, since the conceptual convergence between the field of Digital Curation and Accessibility is a challenge, aggravated by the fact that, to date, the discussion in this specific context is still incipient within Information Science. An examination of the literature showed a discernible gap, both nationally and internationally, in the presence of consolidated approaches that bring together these two conceptual pillars.

The lack of related work underscores the uniqueness of the research in question and provides a framework for reflection on the possibilities of actions that can be taken in each institution.

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