RIHV Revue Interdisciplinaire sur le Handicap Visuel

The practices of tactile graphics adaptation among professional transcribers

Théophile VIER[1, 2*], Christophe JOUFFRAIS[3, 4] et Julie LEMARIÉ[2]

[1] Fondation Institut des Jeunes Aveugles, Toulouse, France
[2] Laboratoire Cognition, Langues, Langage, Ergonomie (CLLE), Université de Toulouse, France
[3] International Laboratory on Artificial Intelligence (IPAL), Centre National de la Recherche Scientifique, Singapore
[4] Institut de Recherche en Informatique de Toulouse (IRIT), Centre National de la Recherche Scientifique, Université de Toulouse, France

* Correspondance : 26 rue Louis Plana 31500 Toulouse, t.vier@ijatoulouse.org

DOI : 10.5077/journals/rihv.2025.e1886

The English version of this article is a personal translation by the authors from the original French manuscript, which was peer-reviewed prior to translation:

Vier, T., Jouffrais, C., & Lemarié , J. (2025). Les pratiques d'adaptation d'images en dessin en relief chez les transcripteurs-adaptateurs professionnels. *Revue Interdisciplinaire Sur Le Handicap Visuel*, (2). https://doi.org/10.5077/journals/rihv.2025.e1886

Abstract: The adaptation of images into tactile graphics is a key issue for improving the accessibility of visual representations for people with visual impairment. This study explores the professional practices of transcribers through a survey conducted in collaboration with the Association des Transcripteurs-Adaptateurs Francophones. The survey aims to characterize the requests and the steps involved in creating tactile graphics. The method is based on the collection of quantitative and qualitative data through an online questionnaire distributed to francophone transcribers. The results reveal several phenomena: insufficient transmission of essential information at the request step, difficulties in analyzing the content of complex images, and a lack of user feedback and proofreading of the adaptations. The study also highlights similarities between tactile graphics adaptation practices and instructional design. Finally, recommendations are proposed to improve practices.

Key-words: Adaptation practices, Tactile graphics, Transcriber, Cognitive ergonomics, Visual Impairment

Introduction

Tactile graphics are graphical representations designed for tactile exploration, using raised lines, dots, shapes, and surfaces. They are an essential means of accessing images for people with visual impairments, particularly in educational settings where images can occupy up to 50% of the page area in school textbooks (Leroy, 2012) and as much as 80% in science textbooks (Bris, 2006); their role is therefore central to knowledge transmission. While textual description is a common way to make images accessible, it has clear limitations for spatially structured content (e.g., maps, diagrams), some aspects of which cannot be adequately conveyed through language (Denis, 2016).

Adapting images into tactile graphics is not new, but a structured methodological framework emerged only in the 1980s. Edman (1992) formalized core principles, emphasizing several key aspects: selecting essential elements, adapting to reader characteristics, and accounting for the context of use. Since then, a range of reports and handbooks has been published to disseminate practice-based knowledge (Červenka et al., 2013; Miller et al., 2022; Schuffelen, 2002).

Adapting an image into a tactile graphic is not limited to simply raising visual elements. It entails a profound transformation of representations to meet the demands of tactile reading, which may alter internal organization of the material, to ensure legibility and accessibility (Bris, 2016). Unlike vision, which affords simultaneous and global perception, touch enforces sequential exploration, requiring the progressive memorization and integration of elements. Consequently, tactile reading imposes a substantial cognitive load on the reader, who must link successive pieces of information to construct a coherent mental representation of the drawing (Gentaz, 2018; Hatwell et al., 2003). A growing body of research on the characteristics of tactile reading (Mascle et al., 2022; Vinter et al., 2020; Wu et al., 2022) highlights essential considerations for designing effective tactile graphics.

This complex work relies on the specialized skills of transcribers, numbering roughly 200 in France (Naves et al., 2016), who work primarily in health and social care organizations, associations, universities, and publishing houses. Their mission is to make a variety of documents (e.g., texts, images) accessible to people with visual impairments. Despite the importance of their role, the profession and its skill set remain largely under-recognized (Association des Transcripteurs-Adaptateurs Francophones, 2024).

For simplicity, we use the umbrella term “transcriber” to refer to professionals who produce accessible formats, including—but not limited to—braille transcription, large-print adaptation, and tactile-graphics production. This usage corresponds to the French professional title *transcripteur-adaptateur de documents*, which denotes a single role encompassing both transcription and adaptation. However, it is important to distinguish these two dimensions of the activity: “Transcription is the exact reproduction of a document or a work in a different format (braille, large print, accessible digital file, etc.). The adaptation of a document is its modification so that it remains functional once transcribed. It is both the process (the modification of the document) and its outcome (the modified document)” (Association des Transcripteurs-Adaptateurs Francophones, 2024).

Our study is part of a participatory research project conducted in collaboration with the Association des Transcripteurs-Adaptateurs Francophones (ATAF). It seeks to analyze the task of adapting images into tactile graphics based on two observations reported by professional transcribers:

- the lack of official and practice-oriented documentation to guide the adaptation of images into tactile graphics;
- the need for precise, concrete, and up-to-date information on the adaptation process of tactile graphics.

The primary objective of this study is to collect data in order to provide an evidence-based account of the task of adapting images into tactile graphics. The results presented here aim to:

- describe the profiles of the professionals involved;
- characterize adaptation requests;
- analyze the production stage of tactile graphics;
- identify the main sources of difficulty and satisfaction experienced by professionals.

Method

Methodology for the development and validation of the survey tool: contribution of the ATAF working group

This study was conducted in two phases, combining prior collaboration with a working group and the implementation of a questionnaire-based survey (see Appendix A).

Prior to the survey, a working group was established at the initiative of the Association des Transcripteurs-Adaptateurs Francophones (ATAF), bringing together eight professional transcribers. The purpose of this group is to design a set of practical recommendations aligned with the realities of professional activity. The expected outcome is a usable work tool that can support novice transcribers while also being shareable with professionals outside the field or beyond specialized institutions. This working group is still ongoing at the present time.

The work began with a review of existing recommendations for adapting images into tactile graphics, drawn from professional reports (Bris, 2003; Červenka et al., 2013; Frankel, 2012; Miller et al., 2022; Pather, 2014; Schuffelen, 2002).

The sessions lasted between one and two hours, with two to three meetings held per month. The work was carried out as follows:

- Analysis of existing recommendations: 8 sessions, totaling 12 hours of collective work.
- Mapping of the image adaptation process into tactile graphics: 2 sessions, totaling 4 hours.
- Characterization of recommendations according to the identified steps: 4 sessions, totaling 8 hours.
- Drafting of the final document (ongoing): 20 sessions, totaling 30 hours.

The group operates under the supervision of the Association des Transcripteurs-Adaptateurs Francophones, and the sessions are facilitated by a transcriber from the association.

In this study, we relied on two key outputs from the ATAF working group:

1. *The main stages of the task of adapting images into tactile graphics:*
    - Request processing: gathering essential information and formulating initial design choices in collaboration with the requester
    - Content analysis: selecting the elements to be represented
    - Choice of representations: selecting textures, patterns, symbols, and labelling conventions
    - Defining the composition: organization and layout of the elements
    - Production – the technical implementation of the tactile graphic
2. *Categories of information required for adaptation:*
    - Reader profile: visual impairment/condition, age, grade level, proficiency in tactile reading
    - Use context: anticipated time of use, accompanied vs. independent use, prepared vs. unprepared use, setting of use
    - Purpose of use: instructional objective, priority elements to be represented

The questionnaire was validated by the transcribers in the ATAF working group prior to fielding the survey. A 90-minute session was dedicated to presenting all the questions and response formats. Feedback concerned the appropriateness of question wording with regard to the information sought, the terminology used, and the response options proposed for multiple-choice items. A pilot test was then conducted with two transcribers, who completed the questionnaire in full.

Data collection and analysis

Data were collected using an online questionnaire comprising 16 multiple-choice items (with single- and multiple-response options) and 13 open-ended questions. Depending on the type of question, the data were analyzed as follows:

- Multiple-choice responses and short open-ended responses were analyzed quantitatively using descriptive statistics (percentages).
- Long open-ended responses underwent thematic analysis to identify categories, developed from the outputs of the ATAF working group.

All the data collected were systematically anonymized to ensure participant confidentiality. This process involved removing indirectly identifying information from responses to open-ended questions. An alphanumeric code (R1–R36) was assigned to each participant to enable data tracking while preserving anonymity; the codes are indicated when verbatim excerpts are reported.

Data analysis was conducted using the framework developed with the transcribers in the ATAF working group, structuring interpretation around the main stages of the process and the information categories identified. Transcribers from the ATAF working group were also involved in interpreting the results, thereby enhancing the validity of the analyses through their expertise and situated knowledge of real work contexts.

Distribution and respondents

The survey was fielded through the networks of the Association des Transcripteurs-Adaptateurs Francophones (ATAF) and Les Doigts Qui Rêvent (LDQR).

In total, thirty-six professionals completed the survey, representing nearly 20% of the total population of professional transcribers in France, based on the most recent figures (Naves et al., 2016).

Results

Profiles of respondent transcribers

Professional experience

The sample of respondent professional transcribers was predominantly composed of experienced practitioners: 59% (n = 21) reported more than 10 years of experience, and 84% (n = 30) had more than 5 years.

Access to transcriber–adapter training

Among all respondents, 67% (n = 24) reported having completed the training program in document transcription and adaptation offered by the *Fédération nationale pour l'Inclusion des personnes en situation de handicap sensoriel et DYS* (FISAF). This is the only program specifically devoted to the transcriber–adapter role. Consequently, 33% (n = 12) had not received formal training.

Prior professional and/or training background

Respondents reported having worked or trained, prior to their transcriber career, in the following sectors:

- 25% (n = 9): graphic design and publishing (e.g., graphic designer)
- 19% (n = 7): administrative sector (e.g., secretary, accountant)
- 11% (n = 4): teaching

Other backgrounds mentioned less frequently included scientific training, disability-related professions, law, library and information services, information technology, commerce/retail, education and care work, and sports-related occupations.

Employment sectors

Nearly all respondents (94%, n = 34) work within health and social care organizations, notably in *Services d'Éducation Spéciale et de Soins à Domicile* (SESSAD), including *Services d'Accompagnement Familial et d'Éducation Précoce* (SAFEP) and *Services d'Aide à l'Acquisition de l'Autonomie et à la*

Scolarisation (SAAAS). Only two respondents (6%) reported working in companies in the adapted publishing sector, such as printing houses or publishers specializing in embossed/raised-format documents.

Size of transcription units

The results indicate that:

- 25% (n = 9) work alone
- 25% (n = 9) work in four-person services
- 22% (n = 8) work in five-person services
- 19% (n = 7) work in services with more than five staff
- 6% (n = 2) work in two-person services
- 3% (n = 1) work in three-person services

Thus, more than two-thirds of respondents work in services of four or more staff, whereas one quarter report working alone.

Characterization of image adaptation requests

Contexts of use

Respondents were asked to indicate the contexts of use for which they receive requests, drawn from five categories defined in advance with the ATAF working group:

- School sector — adaptation of instructional materials for learners from preschool through high school
- Higher education — adaptation of instructional materials for university students
- Individualized external requests — requests from individuals or organizations for a specific identified reader (e.g., a tactile map for a specific route between two locations)
- General external requests — requests from individuals or organizations intended for an unspecified readership (e.g., a city map produced for a municipality and made available to the public)
- Cultural products — adaptation of artworks, comics/graphic novels, and related materials

An additional open-ended question invited respondents to indicate the proportion that each selected context of use represents in their day-to-day work.

The results show that 92% (n = 33) of respondents receive adaptation requests from the school sector, making it the primary context of use. In addition, 47% (n = 17) receive requests related to higher education, 33% (n = 12) handle general external requests, 22% (n = 8) address individualized external requests, and 36% (n = 13) work on cultural products.

The real share of requests originating outside the school sector should be interpreted with caution, as respondents reported that non-school requests are far more occasional. Among the 27 respondents who indicated working both in the school sector and in at least one other domain, half (n = 14) specified that requests from the school sector account for 75–95% of their day-to-day workload.

Ages of end users

The results indicate that the 6–11, 12–15, and 16–18 age groups are the most represented among the intended readers of tactile graphic adaptations, reported by 86% (n = 31), 94% (n = 34), and 89% (n = 32) of respondents, respectively. The 18–25 age group follows, at 64% (n = 23). The “0–5 years” and “over 25 years” categories are much less represented, with 25% (n = 9) and 22% (n = 22) of respondents, respectively, handling requests for these age groups.

Main requesters of the adaptations

The results show that the main requesters are specialist teachers and mainstream classroom teachers, reported by 83% (n = 30) and 72% (n = 26) of respondents, respectively. Other requesters include:

- 28% (n = 10): other professionals within the organization (e.g., orientation and mobility instructors)
- 17% (n = 6): external organizations
- 14% (n = 5): *Accompagnants d'Élèves en Situation de Handicap* (AESH; classroom support staff for students with disabilities)
- 8% (n = 3): the end user themselves
- 6% (n = 2): the end user's family

Selection of adaptation format

When an image adaptation request is submitted, it does not necessarily result in a tactile graphic. In consultation with the requester, the transcriber may propose one or more alternative adaptation formats that are judged more suitable than a tactile graphic—for example, a textual or verbal description; the use of manipulable pedagogical objects (e.g., models, toys); or the creation of such objects if existing materials are not appropriate.

The results indicate that it is fairly common for transcribers to propose alternatives to a tactile graphic when adapting an image:

- Nearly half of respondents (47%, n = 17) reported proposing alternatives in 50% of cases.
- Nearly one third (31%, n = 11) do so in 25% of cases.
- 17% (n = 6) do so in 75% of cases.
- 6% (n = 2) never propose alternatives.
- None reported proposing an alternative every time.

Reasons for proposing alternatives to tactile graphics

Respondents identified three main scenarios in which they propose alternatives to a tactile graphic:

- Characteristics of the source document are judged incompatible with adaptation into a tactile graphic (38%, n = 14).
- The student would waste time with a tactile adaptation compared with a verbal description (30%, n = 11).
- It is deemed possible to convert the information into a verbal format (22%, n = 8).

Proportion of adaptation requests resulting in tactile graphics

The results show that:

- 50% (n = 18) estimate that three quarters of image adaptation requests result in tactile graphics.
- 31% (n = 11) estimate that half of the requests result in tactile graphics.
- 17% (n = 6) estimate that one quarter of the requests result in tactile graphics.
- Only one respondent estimates that none of the requests result in tactile graphics.
- None of the respondents estimate that all requests result in tactile graphics.

Key information needed to process an image adaptation request

Results for this open-ended question were as follows:

- 61% (n = 22): Key vs. lower-priority content elements
  R2: “What is indispensable?”
  R5: “Which elements are essential for the student? Which can be left out?”
- 44% (n = 16): Purpose of use (instructional objective)
  R7: “What is the pedagogical objective?”
  R9: “What learning goal do you intend to pursue with this document?”
- 28% (n = 10): Reader’s proficiency in tactile reading
  R3: “What are the student’s tactile skills?”
  R17: “Has the student already worked with this type of tactile graphic before?”
- 22% (n = 8): Time available to produce the adaptation
  R11: “How much time do I have to make this adaptation?”
  R13: “Is this request urgent? The quality of the work won’t be the same depending on the answer—at least if the request isn’t too large.”
- 17% (n = 6): Residual visual capacities and the possibility of a dual-mode (braille-and-print) format
  R35: “Can we use a dual-mode (braille-and-print) format?”
  R36: “What is the user’s residual vision?”
- 14% (n = 5): Possibility of using a description instead of a tactile graphic
  R27: “Can the document be replaced by a description?”
  R31: “Can the document be described rather than converted into relief?”
- 14% (n = 5): Time anticipated for use
  R1: “How much time will you spend on the graphic?”
  R17: “How much time does the student have to familiarize themselves with the tactile graphic?”
- 11% (n = 4): Accompanied vs. independent use
  R3: “Will the student be accompanied by an AESH?”
  R10: “Will the user read it alone, or be accompanied for the first reading?”
- 6% (n = 2): Grade level
  R8: “What is the student’s grade level?”
- 6% (n = 2): Setting of use
  R17: “Under what conditions will they be able to use the tactile graphic (in class, at home, outdoors)?”

Use of a request form for image adaptations

Nearly half of respondents (47%, n = 17) report that their organization uses a form for requesters to submit image adaptation requests.

Evaluation of the amount of information provided by requesters

When asked about the amount of information received to produce a tactile graphic adaptation, respondents’ answers varied. In response to the statement, “Most of the time, I receive enough information to produce the tactile adaptation”, the results were as follows:

- 56% (n = 20) “somewhat agree”
- 33% (n = 12) “somewhat disagree”
- 8% (n = 3) “strongly disagree”
- 3% (n = 1) “strongly agree”

Thus, a slight majority (59%, n = 21) consider the information sufficient, whereas 41% (n = 15) judge it insufficient.

The use of a request form appears to have little effect on this perception. Among the 17 respondents working in a service that uses a form, 65% (n = 11) reported receiving sufficient information—a slightly higher proportion. An examination of a form used by one respondent’s

organization (see Appendix B) suggests that this modest effect may stem from the absence of questions about the purpose, context, or reader profile.

Most frequently missing information

When asked to choose among the three main categories of information essential to adaptation (reader profile, context of use, purpose of use), respondents reported that the information most often missing concerns the context of use (75%, n = 27), followed by the purpose of use (58%, n = 21), and then the reader profile (31%, n = 11).

Characterization of tactile graphic adaptation practices

Production techniques for tactile graphics

The results show that the swell paper (microcapsule) method is by far the most widely used, reported by 92% (n = 33) of respondents. The second most common method—raised-line drawing on plastic film (also referred to as Dycem paper)—is mentioned by 39% (n = 14).

Other techniques remain marginal: vacuum thermoforming and dot embossing (braille-dot drawing) are each used by 14% (n = 5), while direct-touch techniques and resin-based techniques are each used by 8% (n = 3). No respondent mentioned the embossing-press technique.

Time required to adapt an image into a tactile graphic

Respondents reported spending between 5 and 30 minutes to produce a simple tactile graphic, such as a basic geometric shape or a minimally detailed diagram. By contrast, for more complex documents—e.g., a geographical map, a diagram with numerous elements, or an adaptation requiring decomposition into multiple tactile graphics—the production time ranges from 1 hour to several days. This wide range reflects the impact of document type (diagram, map, geometric figure) and complexity on production duration.

Reference materials used by transcribers

The majority of respondents (75%, n = 27) reported relying on existing tactile graphics from their organizations' archives and/or online databases. Some respondents (14%, n = 5) also mentioned using training materials or guidelines (e.g., training material on tactile graphics adaptation; Bris, 2003).

The online databases indicated were:

- The online database of the *Institut National Supérieur de formation et de recherche pour l'Éducation Inclusive* (INSEI; National Higher Institute for Training and Research in Inclusive Education)
- The online database of the *Centre Technique Régional pour la Déficience Visuelle* (CTRDV; Regional Technical Center for Visual Impairment)
- The *Base de Données de l'Édition Adaptée* (BDEA; Adapted Publishing Database), hosted by the *Institut National des Jeunes Aveugles* (INJA; National Institute for Blind Youth)

Frequency of quality reviews of adaptations

The results show that a majority (56%, n = 20) estimate that fewer than 25% of adaptations undergo a review, while approximately one quarter (28%, n = 10) report that none are reviewed. The remaining respondents were distributed as follows:

- 8% (n = 3) estimate that more than 75% of adaptations are reviewed;
- 6% (n = 2) estimate that 50–75% are reviewed;
- 1 respondent indicates that all adaptations are reviewed;
- No respondent selected the option "25–50% of adaptations are reviewed."

Identity of reviewers

When reviews are conducted, respondents indicated that they are mainly carried out by another transcriber in the service (47%, n = 17) or a non-transcriber staff member within the organization (39%, n = 14), and less often by a reader with visual impairment (28%, n = 10), often the student for whom the adaptation is intended. Only one respondent mentioned collaborating with an external expert in tactile reading and document adaptation.

Frequency of feedback on use

The results indicate that transcribers seldom receive user feedback. A large majority (81%, n = 29) reported receiving feedback in fewer than 25% of cases. The other response options were mentioned only marginally:

- "Never" and "50% to 75% of the time" were each selected by 2 respondents.
- "25% to 50% of the time," "More than 75% of the time," and "Always" were each selected by a single respondent.

Assessment of the importance of feedback on use

The results show that 64% (n = 23) of respondents consider feedback on use "essential," while 36% (n = 13) judge it "useful." No respondent rated it "of little use" or "not at all useful."

Transcribers' perceived difficulties and sources of satisfaction in tactile graphic adaptation

Main difficulties reported by professionals in tactile graphic adaptation

In order of importance, the main difficulties reported by respondents were:

- 56% (n = 20): Content analysis and identifying the essential elements to be conveyed.
  R1: "What information is important?"
  R34: "When there is a lot of information, knowing how to prioritize it."
  R30: "The complexity and understanding of the source document."
- 22% (n = 8): Insufficient information from the requester about the purpose, context, and/or reader profile.
  R10: "One of the main difficulties is knowing the pedagogical aim of the document."
  R19: "A lack of instructional information for handling the *(source)* document."
  R30: "Not knowing the student's level in terms of ability to explore the tactile graphic."
- 19% (n = 7): Choosing raised representations to ensure tactile accessibility.
  R27: "Legibility when there are too many areas to differentiate."
  R33: "Depending on the number of elements to represent, we have to find the right patterns so they are easily identifiable. The result after swelling is sometimes disappointing."
- 19% (n = 7): Technical and time constraints, mainly related to drawing software and managing the time available.
  R2: "The difference between the apparent scale on screen and the actual dimensions once printed, the rendering of textures."
  R30: "Too little time allocated to producing the tactile graphic."
- 11% (n = 4): Individual difficulties experienced by the professional.
  R3: "The large size of braille text."
  R15: "Trying to put oneself in the place of a blind or low-vision person. Not necessarily knowing in what order the user will explore the tactile graphic."
- 6% (n = 2): Lack of feedback on use.
  R3: "Textures for which we don't have enough feedback."
  R14: "When it comes to diagrams, I often get little feedback."

Main sources of satisfaction in tactile graphic adaptation

In order of importance, the main sources of satisfaction reported by respondents were:

- 42% (n = 15): An adaptation outcome judged accessible, usable, and legible
  R3: "Making a document accessible."
  R8: "Making it accessible and delivering a document that is readable and understandable."
- 36% (n = 13): Succeeding in conveying the essential message
  R2: "Striving to include only what is essential."
  R22: "Effective transmission of content."
- 33% (n = 12): Receiving positive feedback from users
  R6: "Positive feedback from the teacher."
  R16: "Feedback from the coordinator on the success of the adaptation."
- 11% (n = 4): Achieving a satisfactory aesthetic result
  R6: "The aesthetic aspect."
  R12: "The aesthetic quality of the tactile graphic."
- 8% (n = 3): Technical mastery of drawing software
  R11: "The design work in Illustrator is also a source of enjoyment."
  R33: "The printed result matches what was envisioned in the software."
- 6% (n = 2): Completing the adaptation within the allotted time
  R13: "…within the allotted time."
  R16: "Adaptation completed on time."

Discussion

Interpretation of the results

The aim of this study was to collect objective data on the task of adapting images into tactile graphics. The results point to several key tendencies: a lack of initial training among professionals; an almost complete absence of requests outside the school context; difficulties stemming from limited knowledge of visual impairment among stakeholders in mainstream settings; and a shortfall in feedback on use. Finally, the survey highlights an adaptation approach grounded in assessing the cost–benefit trade-off for the student.

Lack of pre-service training and professionalization challenges

The high proportion of untrained professionals (33%) can be explained in part by the fact that the reference training program—a university bachelor's degree jointly run by FISAF and Université Paris 13—although recognized, is the only one of its kind in France and presents several barriers to entry: employer cost, work–study organization, and admission criteria. As a result, many professionals work without specific pre-service training and have heterogeneous profiles and trajectories, as confirmed by the survey findings.

These professionals therefore typically develop their skills on the job, relying on informal peer-to-peer transmission—provided they do not work in isolation (Association des Transcripteurs-Adaptateurs Francophones, 2024). Yet 25% of respondents report working alone. This situation is compounded by the fact that training is not mandatory, even though it is mentioned in the 1966 collective agreement *(a French national agreement covering employment conditions and pay scales in the non-profit medico-social sector)* as a condition for access to the dedicated pay scale.

This training deficit may lead to substantial inequalities in the quality of adaptations produced, notably with respect to mastery of transcription standards, digital tools, and accessibility principles. It also raises broader issues related to the profession's professionalization and recognition. It therefore appears crucial to facilitate access to pre-service training—by easing entry requirements—and to systematize training for newly hired professionals.

Concentration of adaptation requests in the school sector

The survey results highlight a strong predominance of the school context in tactile graphic adaptation activities. This pattern is largely explained by the framework of inclusive education, in which adapting instructional materials for students with visual impairments is mandatory. This requirement drives the sustained production of adapted documents—all the more so as school textbooks typically contain a high density of images.

By contrast, in non-school contexts—vocational training, employment, or everyday life—no comparable requirement structures demand. As a result, tactile graphic adaptations are far rarer, as confirmed by our findings. Even in higher education, where the requirement to adapt materials also exists, recourse to transcription services remains marginal.

This observation raises a central question, namely the accessibility of graphical documents for people with visual impairments beyond compulsory schooling. Further research is needed to identify barriers to the wider dissemination of adaptations in these contexts.

Barriers related to limited understanding of visual impairment

The predominance of the school sector in requests for tactile graphic adaptations highlights a major challenge in supporting students with visual impairments in inclusive education: a lack of training and awareness among mainstream school stakeholders—particularly mainstream classroom teachers—regarding the specificities of visual impairment.

This deficit first manifests in the concrete difficulties reported by transcribers: source documents deemed unsuitable, substantial gaps in information about the teaching context, and imprecise instructional guidance. Beyond these practical hurdles, this finding raises questions about the overall quality of support provided to students with visual impairments within inclusive schooling.

It appears essential to strengthen awareness and training among mainstream teachers regarding visual impairment, in order to ensure genuinely accessible and appropriately adapted learning conditions.

A shortfall in feedback on use

The results reveal a substantial shortfall in feedback on use for completed adaptations. Yet respondents largely regard such feedback as essential for improving practice. This aspect of the adaptation process therefore needs to be structured so that professionals can iteratively adjust their work.

Discussions with transcribers in the ATAF working group indicate that, when feedback is obtained, it is most often informal: in person when possible, or via email exchanges. It is generally solicited at the transcriber's initiative. Spontaneous feedback from users is rarer and tends to occur mainly in cases of major defects that have compromised—or even prevented—use. To our knowledge, no specific tool is in place to ensure the regular collection of such feedback. This shortfall can thus be explained, at least in part, by the absence of dedicated tools to facilitate its capture, whether from users themselves or from their support personnel (e.g., specialist teachers, mainstream classroom teachers).

A pragmatic approach based on cost/benefit assessment for visually impaired students

The survey results indicate that transcribers make adaptation decisions based on a cost–benefit assessment for the student, taking into account the student's characteristics, the context of use, and the instructional objective. When they judge that a tactile graphic is likely to impose an excessive cognitive or time burden, they often favor a textual alternative. This assessment rests on anticipating the difficulties that a student with visual impairment might encounter in class with this type of material.

These observations raise questions about the suitability of tactile graphics as classroom teaching aids, particularly in light of the difficulties anticipated by professionals. They also highlight how transcribers account for the specific characteristics of tactile graphics, which differ from textual

descriptions in how knowledge is conveyed and acquired. The mainstream classroom context does not appear to offer the conditions needed for the optimal use of tactile graphics as instructional materials, due to often limited time and insufficient support for their use or preparation in advance with a specialized teacher. In addition, some adaptations—especially those covering entire textbook chapters—require the production of a large number of tactile graphics, which complicates their use for students in terms of both materials and time.

The adaptation process therefore involves reconciling several parameters: the instructional objective, the end user's profile, and constraints specific to the learning situation. Transcribers strive to preserve the didactic function of the material while ensuring its legibility and accessibility.

Among the most decisive pieces of information are an explicit statement of the instructional objective and a prioritization of content elements. Transcribers seek a balance between cognitive cost, time of use, and attainment of the instructional objective. To this end, they draw on the information available to design a solution that is both adapted and functional. This approach is fully consistent with the principles of instructional design outlined by Tricot and Musial (2020). Taken together, these elements underscore that adapting an image into a tactile graphic cannot be reduced to mere raised transcription; it requires an analysis of use, context, and user profile.

Conclusion and perspectives

This study contributes to the objectification of tactile graphic adaptation practices, highlighting several key choices and constraints that structure them. The findings underscore, in particular, the challenges of individualizing adaptations in relation to the end user's characteristics and the context of use—elements that are essential to achieving the primary goal of this task: enabling the user to access the core message of the source document. These challenges are especially salient for instructional materials, the most frequent use case, where producing a tactile graphic requires both a didactic adaptation of content and attention to the specific conditions of the mainstream classroom. In addition, several difficulties encountered by transcribers were identified, notably the lack of information provided—despite its importance for decision-making—as well as the complexity or unsuitability of source documents, which often necessitate substantial simplification of the source content to ensure the accessibility of the final product.

The findings also open several important avenues for research. First, the accessibility of graphical documents beyond compulsory schooling (higher education, employment, continuing education) remains largely unexplored. Second, the lack of pre-service training for teachers on the specificities of visual impairment calls into question the education system's capacity to provide genuinely inclusive support. Third, the study highlights the absence of a formalized framework for end-user participation in the adaptation process, raising the question of the user's effective place within that process.

Based on the results of this study, we formulated several recommendations. These concern the structuring of specific aspects of the adaptation activity, the initial and continuing training of transcribers, and the awareness-raising of stakeholders in mainstream settings. These different areas of focus provide concrete levers to improve practices, strengthen recognition of transcribers' specific skills, and support the professionalization of this activity.

Recommendations

1. Improve the transmission of essential information

Implement a standardized request form for requesters to provide key information:

- Organizational information: time available to produce the adaptation
- Purpose of use: target concepts or essential information to be conveyed; priority content elements
- Context of use: expected time of use; accompanied vs. independent use; prepared vs. unprepared use; setting of use (in class, at home, on the move).

- User profile: educational level; functional implications of the visual impairment; notable strengths and difficulties in tactile reading; mental representation abilities

2. Strengthen and systematize transcriber training

- Systematically enroll newly hired transcribers in training upon taking up their post
- Adjust access and participation modalities for the FISAF diploma program:
  - Ease admission criteria
  - Revisit the work–study program structure to facilitate work organization for employers
- Review the content of the current FISAF program to ensure that modules on adapting images into tactile graphics address the real demands of the task in a relevant and sufficient manner
- Develop continuing training modules to enable experienced professionals to update their skills and knowledge (e.g., practice-based exchanges on strategies for resolving complex adaptation problems).

3. Raise awareness and train stakeholders in mainstream settings

- Organize annual awareness days, including transcribers, with teaching staff from schools that cater to visually impaired students, focusing in particular on:
  - Pedagogical accessibility for students with visual impairments
  - The tactile graphic adaptation process and the teacher's role within this context
- Establish a framework for privileged exchanges between the various support staff for visually impaired students (transcribers, host teachers, specialized referral teachers, orthoptists) in order to support those working in mainstream education, answer their questions, and provide them with solutions whenever possible.

4. Facilitate and increase feedback on use

- Develop tools to increase feedback on use:
  - Satisfaction survey: regularly send a short questionnaire to teachers and students on perceived satisfaction
  - Classroom observations: study how students interact with tactile graphics to identify practical difficulties
  - Focus groups: bring together transcribers, specialist teachers, and visually impaired students to analyze tactile graphics and formulate suggestions for improvement

5. Structure and increase quality reviews of adaptations

- Implement regular reviews with:
  - End users
  - Experts in tactile reading and document adaptation

Acknowledgments

We express our deep gratitude to the transcribers in the ATAF working group for the time they dedicated to us and their invaluable assistance.

We also thank the *Association des Transcripteurs-Adaptateurs Francophones*, *Les Doigts Qui Rêvent*, and the *Cherchons Pour Voir* laboratory for their active support in disseminating our survey.

Finally, we warmly thank all respondents who took the time to participate, thereby contributing to the progress of our work.

ORCID ID

Théophile Vier: https://orcid.org/0000-0002-8743-6848
Christophe Jouffrais : https://orcid.org/0000-0002-0768-1019
Julie Lemarié : https://orcid.org/0000-0002-5518-0868

Appendix A. Questionnaire

Q1. How long have you been a transcriber? (Open-ended)

Q2. What occupations have you trained for and/or practiced? (Open-ended)

Q3. Have you completed the document transcriber–adapter diploma program ("Transcripteur-adaptateur de documents") offered by FISAF? (Single-response multiple-choice)

Q4. What type of organization do you work in? (Open-ended)

Q5. What is the size of your transcription service? (Single-response multiple-choice)

Q6. For which domains are the tactile graphics you produce intended? (Multiple-response multiple-choice)

Q7. If you produce tactile graphics for several domains, indicate the proportion for each. (Open-ended)

Q8. For which age groups do you produce tactile graphics? (Multiple-response multiple-choice)

Q9. When you produce a tactile graphic, what are your main sources of difficulty? (Open-ended)

Q10. When you produce a tactile graphic, what are your main sources of satisfaction? (Open-ended)

Q11. For students in inclusive education, who primarily submits adaptation requests? (Multiple-response multiple-choice)

Q12. If you produce tactile graphics for sectors other than inclusive education, who primarily submits adaptation requests? (Open-ended)

Q13. Do you send requesters a document or request form to accompany the source file and specify the request? (Single-response multiple-choice)

Q14. Upon receiving an image adaptation request, if you could ask the requester only three questions to gather the essential information, what would they be? (Open-ended)

Q15. "Most of the time, I receive enough information to produce the tactile adaptation." (Likert scale)

Q16. When useful information is missing, what does this missing information usually concern? (Multiple-response multiple-choice)

Q17. Among the image adaptation requests you process, what percentage do you estimate result in proposing an alternative to a tactile graphic? (Single-response multiple-choice)

Q18. What are the main reasons that lead you to propose one or more alternatives to a tactile graphic to adapt an image? (Open-ended)

Q19. Among the image adaptation requests you process, what percentage do you estimate result in tactile graphics? (Single-response multiple-choice)

Q20. Which tactile graphic production techniques do you use? (Multiple-response multiple-choice)

Q21. How long do your shortest tactile graphics take to produce? If possible, illustrate with an example: "For the diagram of …, which was very quick to make, it took me …." (Open-ended)

Q22. How long do your longest tactile graphics take to produce? If possible, illustrate with an example: "For the diagram of …, which was very long to make, it took me …." (Open-ended)

Q23. When producing a tactile graphic, is it generally completed in one sitting (without interruption), or are you frequently interrupted by other tasks, forcing you to complete it over multiple sessions? (Single-response multiple-choice)

Q24. If you are frequently interrupted, can you explain why? (Open-ended)

Q25. What resources do you rely on when producing a tactile graphic? For example, training materials, existing tactile graphics used as models, etc. (Open-ended)

Q26. How often do you test your tactile graphics before sending them out? (Single-response multiple-choice)

Q27. When you have your tactile graphics tested, who usually conducts the tests? (Multiple-response multiple-choice)

Q28. How often do you receive feedback on use regarding the tactile graphics you produce? (Single-response multiple-choice)

Q29. When you receive feedback on use regarding completed tactile graphics, how do you rate this feedback? (Single-response multiple-choice)

Appendix B. Contents of a form used to submit transcription/adaptation requests

- Document title: *Transcription–Adaptation Liaison Sheet*
- Document subtitle: *1 document = 1 subject / 1 textbook only / 1 single return date / work planned for 1 week only*
- Required information:
    - Request date
    - Student's name
    - Name of mainstream classroom teacher or specialist teacher
    - Subject area
    - Return date to the school (due date)
    - Title of the teacher's document, or, if a textbook/novel:
        - Title and grade level
        - Author
        - Publisher and year
        - ISBN
        - Digital source
        - For specialist teachers: if the resource comes from the organization's stock, Platon, the BDEA database, etc., provide the resource title.
    - Pages to adapt, selection of exercises, changes to instructions
    - Notes (e.g., expected format, type of adaptation, document previously adapted)
    - Return/delivery of the transcribed/adapted document *(checkboxes)*:
        - To the student
        - To the teacher (sealed envelope)
        - By email (specialist teacher)
        - By internal shuttle
- Endnote: Please ensure the quality of the document to be adapted so that it can be easily scanned (no handwritten text, no indistinguishable colors, etc.). Please always provide the digital source of the document when available.

Editor-in-Chief : Dannyelle Valente
Editor : Lola Chennaz

References

Association des Transcripteurs-Adaptateurs Francophones. (2024). *Dossier thématique n°3 : Définition métier*. https://sitewp.transcripteur.fr/wp-content/uploads/2022/06/Definition-metier-ATAF.pdf

Bris, M. (2003). *Recommandations pour la transcription de documents*. https://www.inshea.fr/sites/default/files/SDADVrecommandations_transcription.pdf

Bris, M. (2006). L'adaptation des supports, une question de l'adaptation didactique : L'exemple de l'iconographie auprès des élèves déficients visuels. *La nouvelle revue de l'adaptation et de la scolarisation*, *33*(1), 15. https://doi.org/10.3917/nras.033.0015

Bris, M. (2016). L'utilisation des documents graphiques. In N. Lewi-Dumont, *Enseigner à des élèves aveugles ou malvoyants* (INS HEA, Réseau Canopé, p. 155-176).

Červenka, P., Hanousková, M., Másilko, L., & Nečas, O. (2013). Tactile graphics production and its principles. *Brno: Masaryk University Teiresiás–Support Centre for Students with Special Needs*. https://www.teiresias.muni.cz/download/tactile-graphics.pdf

Denis, M. (2016). Descriptions spatiales. In *Petit traité de l'espace* (p. 173-198). Mardaga ; Cairn.info. https://shs.cairn.info/petit-traite-de-l-espace--9782804703226-page-173?lang=fr

Edman, P. K. (1992). *Tactile Graphics*. American Foundation for the Blind.

Frankel, L. (2012). *Smarter Balanced Assessment Consortium: Tactile Accessibility Guidelines*. https://portal.smarterbalanced.org/library/en/tactile-accessibility-guidelines.pdf

Gentaz, É. (2018). *La main, le cerveau et le toucher. Approches multisensorielles et nouvelles technologies : Vol. 2e éd.* Dunod.

Hatwell, Y., Streri, A., & Gentaz, É. (2003). *Toucher pour connaître. Psychologie cognitive de la perception tactile manuelle*. Presses Universitaires de France.

Leroy, M. (2012). *Les manuels scolaires : Situation et perspectives* (Nos. 2012-036). Inspection générale de l'éducation nationale. https://www.education.gouv.fr/sites/default/files/2020-02/rapport-igen-2012-036-les-manuels-scolaires-situation-et-perspectives-225073-pdf-32072.pdf

Mascle, C., Jouffrais, C., Kaminski, G., & Bara, F. (2022). Displaying easily recognizable tactile pictures: A comparison of three illustration techniques with blind and sighted children. *Journal of Applied Developmental Psychology*, *78*, 101364. https://doi.org/10.1016/j.appdev.2021.101364

Miller, I., Pather, A., Millbury, J., Hasty, L., O'Day, A., & Spence, D. (2022). *Guidelines and Standards for Tactile Graphics*.

Naves, P., Neuschwander, I., & Pellet, S. (2016). *Les structures ayant une activité d'adaptation des œuvres au bénéfice des personnes en situation de handicap—Réalités observées et perspectives*. Inspection Générale des Affaires Sociales. https://igas.gouv.fr/Les-structures-ayant-une-activite-d-adaptation-des-oeuvres-au-benefice-des

Pather, A. (2014). The World of Tactile Graphics : Tips and Best Practices for Teachers and Instructors. *Blog on Blindness*. http://blog.pdrib.com/tactile-graphics-tips-for-teachers/

Schuffelen, M. (2002). *On Editing Graphics For The Blind*. Netherlands Library for Audio Books and Braille.

Vinter, A., Orlandi, O., & Morgan, P. (2020). Identification of Textured Tactile Pictures in Visually Impaired and Blindfolded Sighted Children. *Frontiers in Psychology*, *11*, 345. https://doi.org/10.3389/fpsyg.2020.00345

Wu, C.-F., Wu, H.-P., Tu, Y.-H., Yeh, I.-T., & Chang, C.-T. (2022). Constituent Elements Affecting the Recognition of Tactile Graphics. *Journal of Visual Impairment & Blindness*, *116*(2), 194-203. https://doi.org/10.1177/0145482X221092031