

Published by :



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Centro de Estudos e Inovação
for Film and Media Arts

DEPARTAMENTO DE
CINEMA
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DOS MEDIA



HEI-Lab
Digital Innovation and Interaction Lab



CICANT

JOÃO LÉSTE (<https://orcid.org/0000-0001-7723-5041>)

PhD student and Master in Design at the Pontifical Catholic University of Rio de Janeiro. The main focus of his current PhD research is the access for blind people in tabletop games, but he also conducts projects focused on other types of inclusion through board games, applying Design in Partnership and Youth Participatory Action Research methods and principles. He is also a volunteer at the Cidadão Pró-Mundo Association, where he currently acts as a Students Coordinator and Unit Director, and has formerly acted as English Teacher, Communication and Events Coordinator, and Pedagogical Coordinator.

JACKELINE FARBIARZ (<https://orcid.org/0000-0003-1329-0695>)

PhD in Education from the University of São Paulo and Master in Linguistics from the Pontifical Catholic University of Rio de Janeiro. She is the Vice-Dean of University Extension and Pedagogical Strategy at PUC-Rio, and Associate Professor and Researcher of the Graduate Program in Design. She is the Coordinator of the Laboratory of Language, Interaction and Meaning-Making in Design (LINC-Design) where she supervises research that reflects on Design as a builder and co-author of social change; and research that focus on the development of extensionist projects focused on Design at the service of Education.

CURRENT ACCESSIBILITY CHALLENGES AND PERSPECTIVES FOR PEOPLE WITH VISUAL IMPAIRMENTS IN TABLETOP GAMES

JOÃO LÉSTE, M.SC.

PUC-Rio, LINC-Design

JACKELINE FARBIARZ, D.SC.

PUC-Rio, LINC-Design

Abstract

Much has already been discussed about the educational benefits of playing Tabletop games. However, as United Nations' Sustainable Development Goal (SDG) 4.5 points out, there still exist many disparities in the access to quality education by vulnerable groups. This paper aims to address some of the factors that contribute to this disparity in regard to people with visual impairments in Brazil. Beyond that, there is a much more dire barrier of access to games: the majority of information about them is presented visually. In practice, people with visual impairments have to rely on the "goodwill" of other people to try and adapt the games for them, who are generally their teachers, friends or relatives. Lastly, this paper presents some accessibility criteria to be considered when designing board games for people with visual impairments, as well as present the Design in Partnership approach as a viable method to design more meaningful games for this context.

Keywords: *Access, Accessibility, Interaction, People with Disabilities, People with Visual Impairments, Social Impact, Tabletop Games.*

Acknowledgments

This study was financed in part by the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior–Brasil (CAPES)–Finance Code 001 – without incurring in conflicts of interest.

We would also like to thank FAPERJ for their support to this research.

Authorship Statements

João Léste: Conceptualization, Methodology, Writing, Rewriting and Editing

Jackeline Farbiarz: Reviewing the paper and Supervising the Research

A Brief Linguistic Introduction

As part of a Research Laboratory that heavily focuses on linguistics and meaning-making, we defend that there can be no true separation between research and researcher; after all, every research is personal, on so many levels: the topics we choose to research (because they resonate with us), the words we choose to express ourselves (because they bring outwards our internal thoughts), the references we choose to employ (because they reflect our personal beliefs). This is further supported by the works of Bakhtin – the author that encompasses our research approach – especially his book “Toward a Philosophy of the Act” (1993 [1921]), in which he describes the intimate ties between responsibility, self-reflection, action, and words – which are indistinguishable from the people that perform them.

Still, I feel compelled to explain myself for the recurrent usage of the first person singular throughout my text: while there is no disagreement from my part that there needs to be *some* decorum in academic writing, I don’t intend to fool anyone: it was in fact I who wrote this document. The research wasn’t “*conducted*”, I conducted it; and employing word games and artifices in the form of the passive voice or sentences without subjects won’t do much to change any of its results. In a way, it actually resonates a lot with the “Design in Partnership” methodology, which places the experiences of designers, researchers, and subjects (partners) as equally valuable for the design process – and that is fundamental to our Department –, so it is in fact a truer representation of the way we conduct research.

If you still need any convincing, I’d like to prematurely present one of my favorite references: *Beast of Burden*, first published

as a paper by Professor Sunaura Taylor, in 2011. In her article, Taylor offers a very personal account of her experiences as a child with a physical disability, how her peers treated her as less-than-human, and how that led her to become a vegan activist, among many other things. Her personal experience with prejudice and mistreatment not only became one of her research subjects, but also pushed her to defend other beings who she perceived to be treated as less-than-human: animals.

So, she offers very visceral and insightful remarks on the intersections between vegan activism and the activism aimed towards people with disabilities, which all stem from her experiences and feelings. Through her work, Taylor becomes a representative of her community and values, crystalizing them through her actions and discourse – which is, again, very much in line with Bakhtin’s approach.

Therefore, this paper’s main objectives are to contextualize the barriers faced by people with visual impairments and disabilities, especially in Brazil, to properly access tabletop games; and present the Design in Partnership methodology as a responsible alternative to remedy that situation, employing the expertise of designers and respecting the self-deterministic approach of the People With Disabilities’ global movement.

A Historical Context of the Societal Treatment of People with Disabilities

Historically, the bodies of people with disabilities have been perceived as non-human, sub-human or aberrant. As Farbiarz (2016) points out, in both Sparta and Athens – which are

regarded by many as the birthplaces of western civilization – it was very common for people with disabilities to be “removed from society” in order to uphold some sort of “demographic equilibrium”. With our modern lenses, it is tempting to imagine that this kind of practice was something mandated by an unnamed and faceless dictatorial force of old, but in fact was something supported even by Plato, and done without much second thought.

However, some more current examples of our societies’ ableist roots can be noted in the profoundly perverse words that are used in medical jargon to refer to people with disabilities, and that are still maintained to this day. As demonstrated by Taylor (2011) in her work, “Beasts of Burden”, people with physical disabilities and congenital conditions are often compared to animals, e.g.1: “Lobster-claw syndrome” (Fig. 1, left), which is the official medical name of a “congenital variation from the upper and lower limbs, with aplasia of the finger bones, resulting in a bifurcation in the extremities” (Kassab, 2021); and “Phocomelia”² (Fig. 1, right), which is the official medical name of a “congenital variation in the development of the long bones from upper and lower limbs” (Kassab, 2021). The idea here being to misuse the authority of the medical field to imply that the people who are born with them are animal-like, instead of “normal humans”.

Even more concerning is the name of the field of study that focuses on congenital variations: “Teratology”, which derives from the French “*tératologie*”. This word, originally formed from the Greek “*τερατολογία*”, is composed by *τερατ/terat*, with the main translations being “monster, beast” and secondary translations being “fugly (which is a vulgar slang for



Figure 1
Photographs representing lobster-claw syndrome³ (left) and phocomelia⁴ (right)

The picture on the left depicts two feet of a person with lobster-claw syndrome, and the picture on the right depicts an x-ray image of a child with phocomelia

“extremely ugly” and seems to be a contraction of “fucking ugly”), fiend, circus freak, hydra”, among many others⁵; and -λογία/-ologie, meaning “study, field of study, the study of”. The word “*τερατ*” also seems to subjectively imply some sort of divine omen or punishment in the form of the disability – which is culturally in line with the genocide of people with disabilities promoted by the ancient Greeks, and many of the societies that preceded and followed them.

The Greek etymology of the word also demonstrates the clear correlation between the way a society perceives something and the choice of words to describe it. It is no surprise at all that a society that murdered people with disabilities without mercy is the same one that called the medical specialization that studies them “the study of the beasts that have been punished by the gods”; and it also follows that our current word choices have much to say in regards to how we treat people with disabilities. In Brazil, for instance, people with disabilities have the choice to apply for a government-funded retirement,

which is called “Retirement due to Invalidity” (Free translation of “Aposentadoria por Invalidez”). So, now, let us make some more etymological digging: “Invalidity” is, naturally, the quality of that which is invalid, or “not valid”; “valid”, in turn, according to the Cambridge Dictionary, primarily means “based on truth or reason; able to be accepted”. Going a little further, the word “valid” derives from the Latin “*valēre*”, which means “to be strong, to be worthy, to suffice”. Therefore, for people with disabilities in Brazil to be able to receive any government aid, they must officially and legally declare themselves *unacceptable, weak, unworthy, and insufficient*.

The Benefits of Playing Games – and who has access to them.

Currently, much has already been discussed in Brazil about the social, cognitive, neurological, behavioral and educational benefits of playing tabletop games. According to Brazil’s federal database for academic publications (*CAPES Periódicos*) there are currently 351 available papers and thesis about the subject⁶, the first being a Master Thesis which demonstrates the huge role that games can have in the teaching of math (Jenilek, 2005).

This database, however, still does not encompass all the scientific production of the country, because they only include papers and theses submitted by partner institutions. Another important source of research about the subject, for instance, would be the Ludus Magisterium Research Group – a WhatsApp group of more than 270 researchers and educators that work with games in educational settings and capacities – and its members are part of a huge portion of

cutting edge projects, events and research about this topic (Carvalho, 2022)⁷.

On the front of Game Publishers, there has been a recent shift in their approach to tabletop games and education, and they have started to encourage and fund studies that look into the benefits of playing games as a stand-alone activity. In practice, that means that they are not necessarily arguing that games should be incorporated in the formal educational context – such as using them in a school setting –, but that the mere act of playing is an educational activity in itself, even if for leisure – which could be considered a form of non-formal or informal education. An example of this is the document “Neuroeducation and Tabletop Games”⁸ (Devir, 2016), which states that games can help develop some of the skills that schools try to impart on students, and offers a list of games published by Devir that develop those skills. One example is the “Verbal Aptitude”, which the document states that can be developed by playing games, such as “SET”, because “this game is ideal to entice children’s perception about the world that surrounds them, and also improves visual attention (visio-perception). It allows for the establishment of sequences and to associate them to different categories.”

We can also examine the booklet “BNCC and Tabletop games”⁹ (Devir, 2018), which relates the skills detailed in the BNCC (“Common National Curriculum Base”¹⁰) with some of the games published by Devir, explaining which game elements can positively influence the development of those specific skills. The BNCC offers the specific abilities that should be developed during each school years, with detailed descriptions

of possible applications, so the booklet first presents a direct quote from the BNCC explaining the relevant skill, to then offer a reevaluation of that skills in the context of playing games, and finish by recommending which games from the publisher can help develop those, as indicated in Fig. 2.

Another important document is the "Catalogue of Educational Games: Fun, Challenges, and Development"¹¹, which has three separate editions (Galápagos, 2020, 2021 e 2022). In it, there are a lot of important information about how tabletop games and their educational potential. It starts by demonstrating some of the characteristics of modern tabletop games that were chosen for this catalogue, such as: having reasonable length (30 to 40 minutes); lots of interactions between players; lack of player elimination; few luck-based events and outcomes; high player protagonism; amongst others. Those characteristics focus on making games shorter, more enjoyable, and focused on the players themselves, their dilemmas, and the choices they need to make, instead of luck-based roll-of-the-die situations that don't really vary from player to player.

The document then presents some of the skills that people tend to develop by interacting with and through those games, such as visual and spacial perception, negotiation skills, strategic planning, to then delve into the most important part of the document: the development of the multiple intelligences, as described by Howard Gardner: Interpersonal, Existential, Logical-Mathematical, Musical, Naturalistic, Spatial, Intrapersonal, Linguistic and Bodily-Kinesthetic. Lastly, the catalogue presents a list of their games with more defined educational potential, indicating the intelligences that they help develop, as well as mapping the BNCC skills that are involved in playing

the game, with the respective school years during which they would be honed, as can be seen below (Fig. 3).

The last document I wish to present for this part of the paper, however, is different in the sense that it is born from a collective effort between academia and the industry: "Board Games in Education"¹² (Devir, 2022). It is a book collectively written by a select group of researchers that delves into the many educational benefits of Board Games, and was published and funded by Devir. Each chapter is written by one or more researchers, and presents one aspect of using board games in education, composing a very rich collection of insights, techniques and practices for educators.

Circling back to the the first document, "Neuroeducation and Tabletop Games", it mentions the "United Nations Convention on the Rights of the Child" (UNCRC), presented in 1989, and ratified under the Brazilian Constitution in 1990. The ratified version states, in its 31st article, that:

1. States Parties recognize the right of the child to rest and leisure, to engage in play and recreational activities appropriate to the age of the child and to participate freely in cultural life and the arts.



Figure 2

Page 12 out of the “BNCC and Tabletop Games” booklet, by Devir (2018) ¹³

Original page on the left, version with free translation on the right. The page presents one of the skills expected by the BNCC, its description, and the games that help develop it.

2. States Parties shall respect and promote the right of the child to participate fully in cultural and artistic life and shall encourage the provision of appropriate and equal opportunities for cultural, artistic, recreational and leisure activity. (UN, 1989)

By referencing the Convention in their document, Devir includes games in the kaleidoscope of cultural activities that they defend should be of equal access to every child – a position with which I wholeheartedly agree, and would like to extend to every person, regardless of age. After all, there’s much

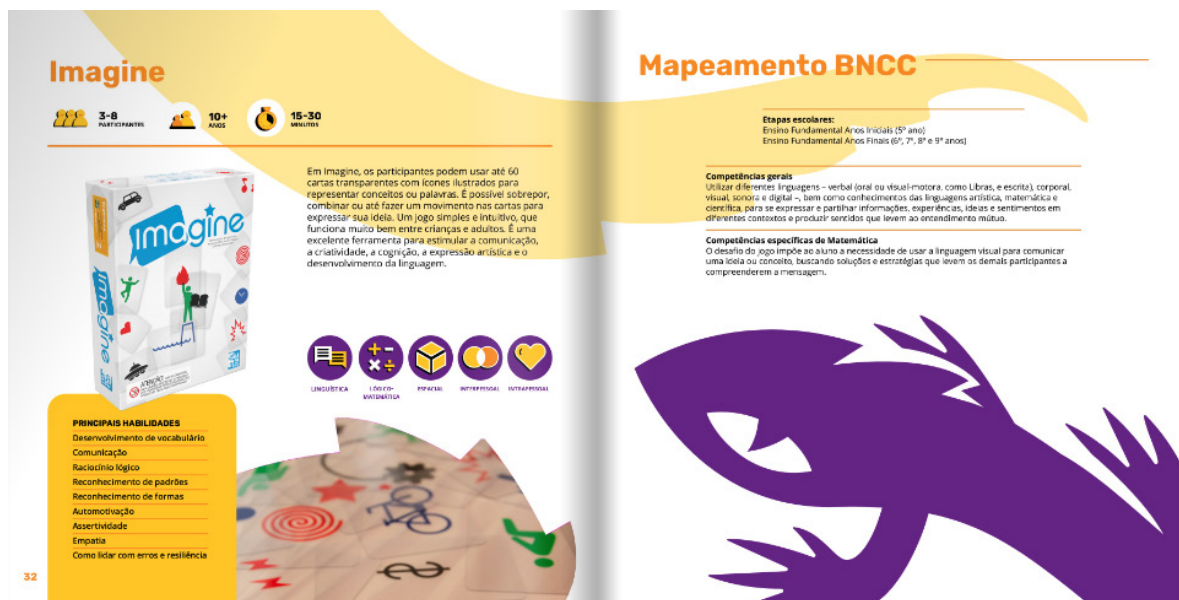


Figure 3
 Pages 32 and 33 out of the "Catalogue of Educational Games 2022" booklet, by Galápagos Jogos (2022) – Free Translation¹⁴
 The pages present the game "Imagine", its description, the skills it develops, the intelligences it is associated with and the respective schooling years they refer to.

still to be said about the benefits that adults can take from playing games, and even the elderly.

However, it's no mystery that the material reality is that this goal is far from being reached. In a country with such social disparity as Brazil, where 55% of the population faces some measure of food insecurity (Freitas, Neto, D'Avila, 2021), games are still an elite product, that is economically inaccessible to a great majority of the population – with a particular bias towards black, disabled and queer people. In fact, if we look for the share of people with disabilities in Brazil, we can

find a huge intersection between people with disabilities and poverty. In 2020, Brazil's Ministry of Citizenship produced its fourth document about "Protection and Social Promotion of People with Disabilities in Brazil: an approach based on social markers and case reports"¹⁵, with some key takeaways:

1. In 2019, there were a total of 12mi people with disabilities in Brazil (7% of the population). 34% of them participate in programs to request government aid. Simultaneously, only 1% of Brazil's formal workforce is composed by people with disabilities – who are generally relegated to low-paying entry positions [p.34].

2. A total of 112.000 family units that include a person with disability live in extreme poverty, with roughly 40% of them being informal workers [p.85].
3. About 21.000 of them have *no formal instruction whatsoever*, and 58.000 have not completed primary school. Only about 20.000 have finished high school, and only about 1.000 have managed to pursue higher education [p.86].
4. Black people with disabilities represent 68% of informal workers with disabilities, while white people with disabilities represent 31% instead. In the formal workforce, the proportion is 51/49, respectively, demonstrating a significant racial bias [p.88]. (Ministério da Cidadania, 2020)

Considering that games from Paper Games, that are well known for being simple and affordable amongst the more established publisher, cost around R\$50,00, and that the minimum wage in Brazil is currently R\$1.320,00, after having been considerably readjusted from previous years (Rocha, 2023); that means that to buy the most affordable games on the market, a person with a minimum wage would need to pay 4% of their total monthly income. However, we know that the wages for people with disabilities are generally lower – and even the ones who qualify for the “Retirement due to Invalidity” receive a value that is proportional to their tax contributions (Gov.br, 2023). Therefore, people with disabilities would need to pay an even greater percentage of their monthly wages, on top of needing to pay for housing, electricity, water supply, food, transportations, and other basic necessities – not even mentioning the specialized equipment they might need, which also tends to be relatively expensive.

The conclusion seems to be that games are simply out of reach for most people with disabilities, because they, as a

social class, lack the funds to pay for such an expensive hobby. So, on top of being deprived of formal education and job prospects, they also can't afford to access the educational resources and benefits provided by games, effectively having yet another of their basic rights being denied.

There's also another layer to that analysis, that goes beyond any legal right, civic duty or moral imperative: as I (Léste, 2021) previously explained, when you are part of a marginalized group, a great share of your life experiences are shaped by the way that society reacts to your negative social markers. This is a profoundly disturbing experience, because what you are is perceived as less-than-human, and this can be a powerful social conditioning that heavily impacts people's own self-worth – since their formative experiences and senses of self are tied to mistreatment, and general experiences of ostracism. In turn, it becomes even more important to offer an alternative to such life experiences: light-hearted and fun activities can be a powerful thing, especially when you're so accustomed to being excluded from them.

Therefore, making our part in helping people from marginalized groups have access to games transcends any rational argument that could be presented by me: it is simply a matter of humanity and, ultimately, a kindness that should not be denied to anyone. Let us all make our parts, then, however small.

Currently, there are already some resources that could make games a little more accessible to people with lower incomes: low-cost games, or games that can be acquired via suggested-contribution purchases, which are often offered by independent game publishers; or even print-and-play games,

which are often available on the websites of more the established ones. There are also free and recurring tabletop game events – although they generally happen in bigger metropolises –, and game bars, where you can access their game libraries for a small fee.

However, these unfortunately *don't even begin* to cross the harshest barrier.

Tabletop Games, Visual Interfaces, and Access

From a product design standpoint, most tabletop games could be described as profoundly visual objects, since most of the information they convey to their users happen through visual interfaces: game pieces are separated by color; boards and cards only convey printed information; rulebooks are also printed; there generally aren't audio-cues; etc.

In practice, what it means is that the majority of information conveyed by the game components to the players need to be

visually decoded, basically keeping people with visual disabilities completely at bay. This happens because we mainly rely on our visual and verbal sensory modules when interpreting information from multimedia documents, which is the basis for Mayer's "Cognitive Theory of Multimedia Learning" (2014).

In turn, because we are so accustomed to access those specific modules when interacting with multimedia documents, we also tend to produce multimedia documents that mainly rely on those two information-processing patterns. In regards specifically to Tabletop Games' Rulebooks, we can reference Mayer's adapted model (Léste, 2021) – which originally talks about multimedia documents in a more general way, but was recontextualized to fit the specific idiosyncrasies of learning how to play games (Fig. 4).

When translating this model to the context of a person with a visual disability, it is apparent right from the start that all the information depicted by pictures will become null, since they would need to be processed by the pictorial model to be

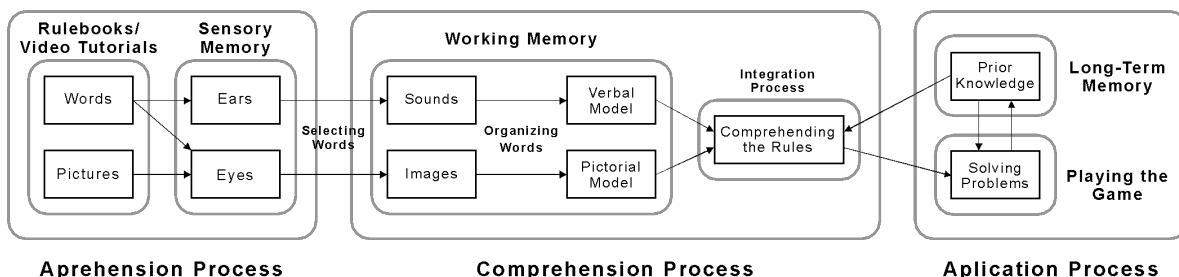


Figure 4
Multimedia Processing Model for the Rulebooks of Tabletop Games (Léste, 2021)¹⁶
Model for multimedia processing in tabletop games that explain Léste's three proposed stages of multimedia learning: apprehension, comprehension and application.

decoded. However, this limitation extends itself to the written word as well, since the words printed on the rulebook would also need to be processed there, as opposed to the spoken language – process which is presented by the downwards diagonal arrow from the “words” block to the “eyes” one.

In that document, I also explain that a very important part of learning how to play games happens by comparing the new codified information to previous experiences. As children, we learn to play simpler games, and we gradually transition to more complex ones, drawing from our earlier experiences to give meaning to the new ones, e.g.: when we are children, we generally learn to play checkers, then chess; since both games share some characteristics (64-tiled board, two sets of pieces with different colors, capturing mechanics during the game), by the time the person is learning how to play chess, they aren’t truly learning it from scratch, because they are drawing from their previous experiences. So, even if a person with a visual impairment somehow finds an accessible game that is compatible with their characteristics and needs, there are still factors that could hinder the process, if they don’t have enough of a background with games to draw upon.¹⁷

Based on that analysis, it becomes apparent that there are two main questions that should be addressed: “How can we adapt games to make them accessible for blind people?” and “Which games should we start with?” One possible approach is to research already adapted games, in order to investigate why they were chosen, which parts were adapted, and how they did it. Unfortunately, most well-established Game Publishers do not have any material about this subject, since almost no modern tabletop games have been designed with

people with visual disabilities in mind, which has to do with the way that many publishers develop new games: generally, board game designers initially design the games on their own, making their low-fidelity prototypes, to then they partner with the publishers in order to polish the project and actually produce them with industry-quality techniques and materials – leaving it up to each individual to take marginalized groups into account or not, which tends to lean to the “or not” side of things (Heron, Belford, Reid & Crabb 2018b).

The only game from a large publisher that I found that seems to take into account any visual impairment is “Azul: Stained Glass of Sintra” (Fig. 5). The rulebook explains how they can be separated by color using the underside of the pane, but that still requires that *someone else playing the game is able to properly perceive colors*, still not imparting autonomy onto people with colorblindness to play the game on their own.

On the other hand, there are some more traditional games currently present on the market that state that they are adapted for people with visual impairments – though they are not exactly easy to find, and most of them just use braille. As part of my research, I have been trying to buy some of them in order to evaluate their effectiveness, but I am limited to my personal funds to do that, and they tend to be much more expensive than non-adapted games. For instance, a regular chess set can be bought for as low as R\$25,00 – about 5€ –, while an adapted one can go for R\$300,00 – about 60€ – or higher. At this point, considering my financial situation and the intersection between disabilities and low-income status, as explained before, I purchased two different games: tic-tac-toe (because of its low cost and readily shipping) and chess

DIFFICULTIES DISTINGUISHING THE COLORS OF THE PANE PIECES?
 Here is how you can set up and play the game:

During step 1 of the setup: Flip the Factory displays to their back. Each of them shows 5 sectors: one for each type of pane piece, made recognizable by their color and the different shapes engraved in them.

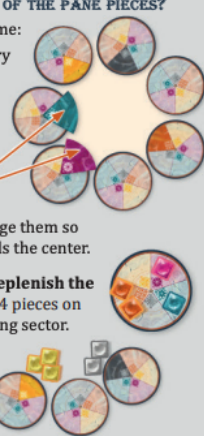
On 5 of the Factory displays, one sector is more colored than the others.
 Make sure that you include these 5 Factory displays when creating the circle and arrange them so that each fully colored sector points towards the center.

During step 8 of the setup and each time you replenish the Factory tiles at the end of a round: Arrange the 4 pieces on each Factory display so that each lies in its matching sector.

During the game: When you move pane pieces from a Factory display to the center of the table, always place each piece near its matching fully colored sector.

To show which color the current top pane piece of the round indicator is: Use any kind of marker (for example a coin) and place it near the fully colored sector that matches the current top pane piece of the round indicator.

When placing pane pieces on your strips: Pay attention to the shapes shown on the pattern spaces and match them with the appropriate pieces.



CREDITS

Game Design: Michael Kiesling
Producer: Sophie Gravel
Development: Viktor Kobilke
Illustrations: Chris Quilliams
Graphic Design: Karla Ron
Editing: Viktor Kobilke
Revision: Neil Crowley
Development by:



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 19 rue de la Coopérative, Rigaud, QC. J0P 1P0, Canada.
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Figure 5

Excerpt from the “Azul: Stained Glasses of Sintra” rulebook, from Next Move Games

Page displays the explanation of how to make the game more accessible to people with difficulties distinguishing the colors from the pane pieces.

(because, despite its higher cost, it is a relatively more common game for blind people to play due to there being official chess tournaments for people with visual disabilities).

Both were advertised as accessible products on a sales platform (Mercado Livre), produced by local businesses that do woodwork, and both games turned out to be very low quality products, nowhere near industry standards. While the tic-tac-toe set (Fig. 6.) seem to have been cut using a laser-cutting machine, due to having very sharp edges, and giving it some measure of quality, many of the pieces were glued together

– with very apparent glue marks –, and the braille beads on the board that spell “*Jogo da velha*” – tic-tac-toe in Portuguese – seem to have been glued by hand, because they are unevenly distributed. Moreover, although subjective, as a designer I feel inclined to say that the paint and colors aren’t exactly aesthetically appealing, and there doesn’t seem to be any coherence behind the color pallet.

As for the chess set (Fig. 7), there are two main components to the board: the “base”, which is a MDF box with the black tiles, tile coordinates, and a bounding box for the tiles painted



Figure 6

Collage of pictures detailing the accessible tic-tac-toe set, taken by me.

A collage of 4 pictures, displaying the set (upper left), examples of a piece of each type, with glue stains (upper and lower right), and a close up from the unevenly distributed braille beads (bottom).

on it, with black ink; and the white tiles, which seem to have been cut with a laser-cutting machine. Each tile has a circular hole in its center, with the ones from the black tiles being significantly bigger. Upon closer inspection, many of the tiles have perceptible damages, and the white tiles do not have the exact size they should, being marginally smaller and having been glued a little crookedly. Furthermore, each tile coordinate has a braille “equivalent” as well, but they have been carved with the laser cutter, instead of being composed of raised dots, as they should. As for the pieces, they seem to have been produced with plastic injection, and each white piece have been pierced by a small wooden cylinder, so that they can be differentiated from the black pieces.

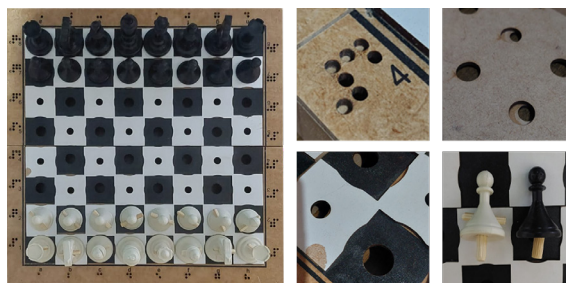


Figure 7

Collage of pictures detailing the accessible chess set, taken by me.

A collage of 5 pictures, displaying the full chess set (left half), an example of the “inverse braille” (right half, upper left), unevenly aligned holes with visible glue stains (right half, upper right), damaged and crookedly positioned tiles (right half, lower left) and a comparison between two crooked pawns of different colors (right half, lower right).

Each chess piece also has a wooden cylinder protruding from their bases, to fit the holes on the board tile, which is a technique that helps people with visual disabilities play the game without knocking them. However, the size of the holes is bigger than of the wooden cylinder – marginally, for the white tiles, and considerably, for the black tiles –, rendering it of very little use in practice. By its underside, you can tell that the white tiles have been improperly glued, as the holes in the base of the board and on the white piece don’t properly align. This, together with the fact that some of the game pieces are relatively crooked as well, makes it a little hard for some of the pieces to even fit some of the tiles, while some others are very loose.

The situation of the chess set becomes even more dire when we realize that chess is a highly competitive game, with worldwide regulations – which extend to adapted versions to

people with visual disabilities. The International Chess Federation (FIDE) has published an official handbook for “handicapped players”, in which it dictates that chess need to adhere to the following requirements:

1. at least 20 by 20 centimeters;
2. the black squares slightly raised;
3. a securing aperture in each square;
4. every piece provided with a peg that fits into the securing aperture;
5. pieces of Staunton design, the black pieces being specially marked. (FIDE, s. d.)

The chess board previously displayer outright does not fit criteria 2, 4, and 5, while technically adhering to numbers 1 – being 39 by 39 centimeters, although *almost double* the recommended size, is *technically at least 20 by 20 centimeters* – and 3 – even though adhering to number 3 but not 4 renders it useless.

The last type of initiative is the one from people on online forums, mainly the ones at the Board Game Geek website. They are generally written by the friends, family members, or teachers of people with visual disabilities, driven by their personal interest in helping the people they know. One such example comes from user “Zach Hoekstra, @Hrusk” in the form of one of the first testimonial about this kind of endeavor, dating from 2009 and being titled “[Gaming with the Blind: a story](#)”. As the title implies, Zach’s testimonial takes the form of a prosaic narrative, in which he initially presents a total of 16 games that he and his friend Adam played together – with varying degrees of success. Zach sheds light in many interesting

aspects and challenges of adapting games – such as it being very hard to translate longer texts to braille, and games with a big amount of components requiring an almost super-human memory –, but unfortunately he does not really offer the steps he took to adapt the games, nor pictures, making it very hard to replicate them, thus making it hard for people with visual disabilities to actually access them.

Lastly, the most consistent production of accessible games comes from LuduScience, a boardgame company that produces boardgames focused on logical and mathematical thinking, with educational goals in mind. In September of 2011, they announced a partnership between them the ACAPO “Association of Blind and Amblyopic [people] from Portugal” [free translation]¹⁸ to produce a range of accessible boardgames. Although they have many games that are not necessarily accessible, the ones produced under the guidance of the ACAPO are located in a specific page on their website, displaying a total of 11 accessible games for blind people, as seen in Fig. 8.

Similarly to the tic-tac-toe and chess sets, they all seem to be mainly produced by laser-cutting machines, as evidenced by the very delicate carvings on the boards – although the pictures indicate that they are higher-quality products. Their color pallet is also mainly of different wooden shades, incorporating other colors only when thematically appropriate – as evidenced by the “Semáforo” game, which stands for “traffic light” and employs red, yellow and green components. Upon accessing the pages for each of the games, they do really *seem* to be accessible, although that has not been tested by me yet, due to the cost and difficulty of importing them to Brazil.



Jogos acreditados pela ACAPO

Jogos Reduzidos

JOGOS LUDUSCIENCE E EXPLORATÓRIO DOMINÓS E DOMINÓIDES

- Dominóide Água
- Dominóide Ar e Clima
- Dominó Enigmas Desafios I
- Dominó Enigmas Desafios II
- Dominó Frações
- Dominóide Materiais
- Dominóide Plantas
- Dominó Numeração Egípcia
- Dominó Numeração Romana
- Dominóide Minerais

JOGOS LUDUSCIENCE

- Ludusfideis
- Salto do Cavalo
- Meta
- Penim
- LudusBraille

JOGOS E ATIVIDADES CRIADAS PARA A ROTA DO ROMÂNICO

- Mapa
- Rota
- Hexiamante
- Azumetria
- Tangram
- Estarolas
- Alquerque

Jogos acreditados pela ACAPO

No sentido de conceber os jogos devidamente adaptados a pessoas cegas e com baixa visão a Luduscience obteve da ACAPO, Associação dos Cegos e Amblíopes de Portugal aconselhamento técnico na criação destes jogos. Estes tiveram a supervisão técnica e científica dos técnicos da ACAPO e são indicados para pessoas cegas e com baixa visão e também se encontram à venda na UEST - Unidade de Equipamentos e Serviços Tifotécnicos (loja da ACAPO), ali, com as regras em braille.

<p>Avanço</p> <p>Chega à 1ª linha do adversário e vence este jogo de Dan Troyka</p> <p>Preço: 19,00 € Ver detalhes</p>	<p>Semáforo</p> <p>Alinha 3 peças da mesma cor com este divertido jogo de Alan Parr</p> <p>Preço: 19,00 € Ver detalhes</p>	<p>Rastros</p> <p>Ser mais rápido ou impedir o adversário - jogo de Bill Taylor</p> <p>Preço: 19,00 € Ver detalhes</p>	<p>Torres de Hanói</p> <p>Resolve este puzzle com o menor número de movimentos</p> <p>Preço: 18,00 € Ver detalhes</p>
<p>Salto do Cavalo</p> <p>Salta como o cavalo e deixa o adversário sem movimentos</p> <p>Preço: 19,00 € Ver detalhes</p>	<p>Moinho</p> <p>Alinha três peças tuas e retira as peças ao adversário</p> <p>Preço: 19,00 € Ver detalhes</p>	<p>Yoté</p> <p>Captura as peças do adversário com este jogo de origem africana</p> <p>Preço: 19,00 € Ver detalhes</p>	<p>Pentalfa</p> <p>Não deixes de jogar este jogo muito popular na ilha de Creta</p> <p>Preço: 19,00 € Ver detalhes</p>
<p>Flume</p> <p>Novo jogo do campeonato de jogos matemáticos 2016/2017.</p> <p>Preço: 19,00 € Ver detalhes</p>	<p>LudusBraille</p> <p>Faz uma sequência de três peças consecutivas seja na horizontal, vertical ou diagonal.</p> <p>Preço: 19,00 € Ver detalhes</p>	<p>Alquerque</p> <p>Jogo Rota do Românico</p> <p>Preço: 16,00 € Ver detalhes</p>	

Figure 8

Collage of pictures detailing the accessible chess set, taken by the author.

The page on the LuduScience website dedicated to selling their 11 boardgames that are accessible for people with visual disabilities.

My only concern pertains to their rulebooks and video tutorials: the website displays a rulebook for every game, and a tutorial video for some of them, but those documents themselves have not been brought up to accessibility standards. As I explain in my Master's Thesis (Léste, 2021), in which I cite Brazil's "Code of Consumer Defense and Protection", the only official requirement for tabletop games' rulebooks is that any product sold in Brazil must be accompanied by instructions of use and assembly, which must be "easy to understand, with illustrations", without further explanation. In practice, what ends up happening is that each person has to interpret the meaning of that based on their own perceptions and their context. Solely based in this requirement, the rulebooks for LuduScience games have very positive characteristics, such as prioritizing that images are right next to the text that refer to them, and also presenting illustrations for each example given.

However, the rulebooks are published as image-based PDFs, making them inaccessible for screen reading softwares. Moreover, even if they were being exported as text-based PDFs with images, they would also need to have embedded descriptions, so that the software could read them. For the video-tutorials, they are generally very didactic, but they also don't really cater to people with visual impairments, that would need further guidance than the superficial descriptions that are enough for people without visual impairments – as they can visually compare what they see in the video with what is in front of them. In the end, that means that the people with visual disabilities that want to play these games will still need someone else to explain how to play them, maintaining their dependency instead of encouraging independence.

Design in Partnership as a path: adapting games *for and with* people with visual impairments.

Unfortunately, this type of situation only reinforces the medicalist paradigm of disabilities, which places the responsibility of dealing with the disability on the individual and their personal support system. This paradigm also explains why the few attempts at adapting tabletop games stem from personal motivations, as indicated previously: friends, family, teachers, and the people with disabilities themselves. Instead, we should focus on practices that support the social model on disability, which

[...] is based on the notion that individual impairment is the main source of the limitations they experience in their daily lives, needing medical attention or curative treatment, whenever possible [Sillers, 1998]. Currently, this model is regarded as a set of "discriminatory normative assumptions" [Greco, 2019], and understood as perpetuating accessibility practices that are reactive, particularist, and maker-centered. [...]

In contrast to the medical model of disability, the social model of disability defines disability as a lack of adjustment between the specific needs of the individual's body and the social, physical or attitudinal context that surrounds it. [...] The implication is that inclusion is a question of changing society, and not of "remediating" the individual. (Sousa et al, 2022)

If we think about people who wear glasses, the difference in both perspectives becomes apparent: an early *homo sapiens* from 300.000 B.C. who was as short-sighted as me would probably be considered a person with a visual disability, as they were unable to properly perform the basic functions needed to survive: hunt, gather, scout, due to their lack of 20-20 sight. But we do not think of modern-day short-sighted people as disabled, since most of them can access basic ophthalmological care, and relatively affordable prescription glasses. In both examples, we are dealing with a *homo sapiens* with the exact same medical condition; however, on the second scenario, *they have access to a wide range of resources that support their needs, even having the possibility of choosing which one they prefer*. So, how can we provide the same level of support in the context of tabletop games?

The first thing we need to keep in mind is the concept of “sensory substitution”: a phenomenon that occurs when one or more of the person’s sensory models is inoperant, resulting in it being overtaken by another sensory model. So, when adapting anything for people with visual disabilities, we are actually offering them more options of sensory substitution than they would naturally have, making the objects, services and events accessible to them through their other senses that are not impaired (Loomis, Klatzky, Giudice, 2012).

However, it is hard to achieve *effective* sensory substitution. Some of the examples shown before, such as the chess set, take into account many sensory substitutions that need to take place in order to make games more accessible, *but it fails to consider that someone is actually going to have to interact with the chess set*. To arrive at that conclusion, you only need

to watch any video of people with visual impairments playing chess – available on YouTube –, and then imagine them interacting with a 39x39cm board, with unevenly glued components, different sized holes, and crooked pieces. And that is the key to it: you actually have to interact with the people who you want to design your games for, in order to make sure that you cater to their wants and needs, and that doesn’t even take into account the difficulty of designing anything that is proper for people with all the ranges of visual impairments. For instance, an *adequate* chess board for a player who is fully blind would be smaller, so they can better navigate the board with their hands; while for a player with partial blindness it would actually need to be bigger, as the one I bought, because they still rely on their partially-compromised vision.

The key here is to understand that different people with different needs will require different resources and adaptations. So, as suggested in the paper by Heron et al (2018a, 2018b), the most effective way to increase the amount of accessible games and to guarantee that their accessibility standards are effective is to include a more diverse cast of people when play-testing games, which leads us to the crux of Design in Partnership: this approach, that is very similar to co-design (Cruz, Couto, Portas, 2019; Cunha, Providência, 2020), was originally

coined by professors Ana Branco and José Luiz Ripper in 1988 as part of the curriculum of PUC-Rio’s Department of Arts and Design. This approach to design was particularly innovative in the sense that focuses on the exchange between people, coexisting in nature, and its primary premisses are the interaction

and dialogue between subjects (Araujo, Brazil, Espanhol, Léste, Perpétuo, 2022) *in lieu* of some more traditional approaches that try to establish the designer as the sole or most relevant decision-maker in the design process, not necessarily taking into consideration the full spectrum of emotions, thoughts, opinions and desires of the final user. (Léste, Brazil, Farbiarz, 2023, in press)

So, it begs us to first interact and share experiences with the people and groups who we want to design for. However, it also goes beyond designing *for* someone, because it recognizes the protagonism that they need to have in the design process in order for us to arrive at a more meaningful result, that will actually impact people in a positive way. This methodology is also very aligned with the “Nothing About Us Without Us” motto, which is the hallmark of the “Disabled People Organizations” global movement, whose main objective is “to achieve the full participation and equalization for, by and with persons with disabilities” (UN, 2004).

Final Considerations

This paper’s goal was to sensitize people without disabilities of the role we can play in building a more equal society together, inside the scope of Tabletop Games. If what you came for is a list of criteria to consider when designing or adapting a game for people with disabilities, I can offer it to you:

1. Focus on games with fewer game components.
2. Avoid games with elements that have a lot of text on them, because braille takes a lot of space. If you absolutely need

to, try summarizing what is written on the game components and offer a reference guide with the full texts.

3. Game elements that are color-coded need to incorporate tactile differences between them, such as height and texture.
4. If game elements need to be positioned in specific spaces, they should be indicated and there should be a physical connector that ensures they stay in place.
5. You should offer both a physical rulebook with braille on it and a digital text-based PDF version. This rulebook should stick as closely as possible to the reading pattern from top left to bottom right. Offering options that each person can choose from is the most effective way of guaranteeing that most people’s needs are met.
6. All images should have image descriptions. In the digital versions, they should be embedded on the images. In the physical version, they should be printed in braille on top of the image.
7. Specially in modern tabletop games, you should include an extra description of the rulebook’s aesthetic, encompassing font choices, illustrations styles, color pallet, etc.

However, if what you desire is to make a meaningful impact on the lives of the, I urge you to consider designing *with* them: coexist, incorporate them in decision making steps of the project, seek their opinions, take their feelings into consideration, and test your artifact every single step of the way.

Game designers, every time you play a game or start prototyping a new project, I invite you to think of how you could make it accessible for people with visual disabilities.

Game publishers, I invite you to think about your company's mission and ask yourselves: "Don't people with disabilities deserve that too?"

Let's build a more equal society together – it is within our power to do so.

Endnotes

- 1 Both definitions were supplied by a medical doctor in a way that would make an accurate and non-offensive description of both congenital variations, as opposed to much of the medical jargon found at large, which generally refers to these conditions as "deformities" and other unnecessarily harsh words.
- 2 "Phoco" derives from the Greek "*phōkē*" (*φώκη*), which refers to seals (the animal)
- 3 Original image can be found at: <https://boneandspine.com/ectrodactyly/>
- 4 Original image can be found at: <https://www.peertechz-publications.com/articles/GJMCCR-6-166.php>
- 5 The full list of translations can be found at the "Word Reference" website: <https://www.wordreference.com/gren/%CF%84%CE%AD%CF%81%CE%B1%CF%82>
- 6 This result was reached by using the advanced research settings on <https://www-periodicos-capes-gov-br.ezl.periodicos.capes.gov.br/> and intersecting both "games" (jogos) and benefits (benefícios) as key-words in the text. While there are noticeably a few results that are not about this particular subject (for instance, a paper about zero-sum games in the economics field), this is not meant to be an extensive research, just a proof of concept that this is a well-researched topic.
- 7 Ludus Magisterium, which I am a part of, is currently working on producing a database solely dedicated to papers, presentations, projects and theses about games and education. The database is still on its very early stages, but can be accessed at: <https://magisterium.lcduarte.com/index.php/rlm/>
- 8 Free translation of "*Neuroeducação e Jogos de Mesa*".
- 9 Free translation of "*BNCC e Jogos de Mesa*".
- 10 Free translation of "*Base Nacional Comum Curricular*".
- 11 Free translation of "*Catálogo de Jogos Educativos: Diversão, Desafio e Desenvolvimento*".
- 12 Free translation of "*Jogos de Tabuleiro na Educação*".
- 13 The document can be accessed at: <https://devir.com.br/escolas/arquivos/BNCCJogosDeMesa.pdf>
- 14 The original document can be accessed at: <https://anyflip.com/hcrv/qucx/>
- 15 Free translation of "Proteção e Promoção Social de Pessoas com Deficiência no Brasil: uma abordagem a partir de indicadores sociais e relatos de caso"
- 16 Original publication can be found at: <https://www.maxwell.vrac.puc-rio.br/53646/53646.PDF>.
- 17 File can be found at: <https://boardgamegeek.com/boardgame/256226/azul-stained-glass-sintra/files>.
- 18 Free translation of "Associação dos Cegos e Amblíopes de Portugal", accessible at: <https://www.acapo.pt/>.

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