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Title

Akshar-Chitra: Type made with folk art as visual mnemonics to enhance the teaching learning of Hindi

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Abstract

This paper examines the work started a couple of years ago to make a teaching aid for primary school teachers using Hindi letters that are embedded with images that relate to the sound of the letter itself, made from Mithila folk art.

While as explained in the paper, images embedded in text have been used before, including in the Devanagari script, what is different and unique about this project is that it has been done in consultation with a host of experts—primary school Hindi teachers in rural and urban India, school owners and principles, Sanskrit scholars and experts who evaluate Hindi school books. Their inputs have not only made our work more accurate than what's previously been experimented with, but this is then become a serious study with field research where the work has been tested and improved upon. The use of folk art adds another layer to the project and allows for embedding local messages, folklore and narratives, making the work richer and more meaningful to both the artist and the user.

Keywords

primary education, literacy, school children, reading and writing, semiotics, alphabet, rebus, lettering, typography, vernacular language, Devanagari script, Hindi, language studies, India, South Asia, Mithila art, folk art, Madhubani art, image-text, text as image, art, text, oral, visual, decolonization, localism, illustrative, teaching aid

Background

While communicating with each other is second nature to us humans, it is debatable if the way we are taught is as effective as our instincts to learn a language[1] (Pinker, S. (1995)). A child's innate sense for language[1] (Pinker, S. (1995)) and communication develops not very differently from how communication skills have evolved in humans — from 'animal-like' cries used to express basic emotions (such as fear, hunger, anger, and love), to tactile communication such as with gestures (pointing, waving, and touching) to the making of abstract and then figurative paintings and pictograms (as seen on the walls of prehistoric caves), which predate writing by 25,000 years[2] (Elbow, P (2015)). Over time, we evolved to use proto-language based on images including hieroglyphs, and finally to more advanced rebus-based syllabic language systems around 3500 BCE[2] that combine speech and visuals in one.

Introduction

"Seeing comes before words. The child looks and recognizes before it speaks"
— John Berger, *Ways of Seeing*

Rationale

The Use of Images

Since visuals play a vital role in a child's development and ability to communicate, the central premise of the paper is that embedding images in text, would not only make instruction more interactive, engaging, and immersive[4] (Ehri, L. C., Deffner, N. D., & Wilce, L. S. (1984)) for the child and the teacher but that this way of learning would also be more enduring rather than by rote. That is, a child would be able to "recall and remember information"[5] (Clark, J. M., & Paivio, A. (1991)) much more if images were used than just text.

This is the reason why images are already—though separately—used when the alphabet is taught to children. However, the difference here is that the letters we have developed—

called, 'Akshar-Chitra'—which are made in the Devanagari script, embed images as part of the letters themselves. As this is perhaps the first time this has been done using the Devanagari script and that too with indigenous folk art or craft, we faced many challenges discussed later in the paper.

The images are morphed into the letter form and they become one entity, unlike usual alphabetic charts that depict images and the alphabet side by side. Made in the Mithila folk art style of Bihar, these letters are used to teach the Hindi alphabet to primary school children. Each of the letters contains images that work like a rebus*. Every letter is therefore made into the form of something tangible or descriptive—such as an object, as 50% of all babies' first word is an object, perhaps because it is tangible and "real". (Pinker, S. (1995))[5] using concrete nouns, such as □□□□, □□□□, □□□□□, □□□□□, □□□□, etc. (Fig. 1).
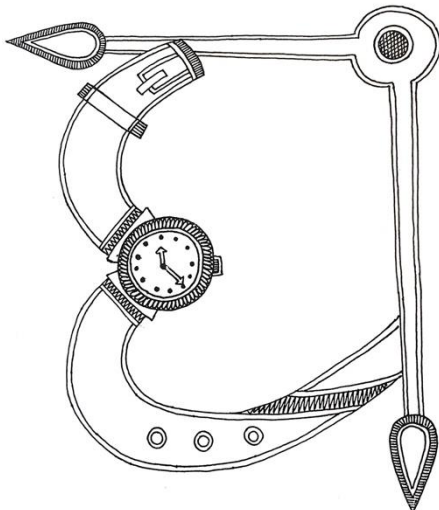

Fig. 1. *Gha* se *ghari* made with Mithila art. Part of the Akshar-Chitra project

By embedding local contexts, we are not only making learning linked to one's culture and decolonizing education and design but also enabling more applications for indigenous folk crafts hitherto not explored. Additionally, most of our sources of knowledge in the classroom seem to be coming from the West while we in India have extremely rich untapped and unexplored resources that can be reexamined and worked on to bring into the classroom.

The Use of the Devanagari Script
We chose the Devanagari script and the Hindi language instead of the Latin script because of the dearth of research and exploration done in the former on Indian children and

schools. We hope to expand this to other regional languages of South Asia funding permitting. We were also mindful of working with folk arts and crafts that relate to the language being spoken in the region.

The Use of Craft

As part of The Typecraft Initiative, the project not only aims to create innovation and livelihood generation for craftspeople but to also disseminate their history, culture, and living narrative traditions to wider audiences and to use type and tech to widen the application of craft. While bringing in regional sources of knowledge into primary education in India we also would like this project to support local—communities, crafts and craftspeople, folklore, and mythology as well as the use of local themes in the letters themselves (Fig. 2).

Fig. 2 यो se योग (yoga) and झो se झोपड़ी (hut)

Previous use of images in letters

Fig. 3 Designs of single letters by other designers (left to right): सड़क, Soumya Tiwari 2017, उल्लू, Crackers World 2019 and ज़बान, Prasam Pal 2019

While we could not find any existing or previous examples of folk-art-related images embedded in the *entire alphabet* in the Devanagari script (Fig. 3), we found examples where designers have done several individual letters using images and type together. However, these have not been used for primary education as the goal of this project is.

Again, there are plenty of examples in the Latin script where the entire alphabet has been made with images but none from a contemporary craft or folk art. Though many are being used for primary school education. Examples of an image as type abound in the design of drop caps letters from medieval European illuminated manuscripts, that combine various types of animals and, gargoyles into letterforms. A more recent, early 20th-century example especially to do with children, is the avant-garde book, *The Scarecrow Fairy*, by two of the proponents of the Dada and De Stijl movement—Kurt Schwitters and Theo van Doesburg, who designed this book consisting of only letters which used *as* images (but not embedded images)[vi] (Fig. 4). More recent examples include the work by Kagoshima Makoto (Fig. 5) and the Alison Clarke's Spelfabet (Fig. 6) using the Latin script image-letters for primary school education. However, *none* of the examples found are made in collaboration with indigenous crafts or tribal art traditions that we aim to bring out with this work.
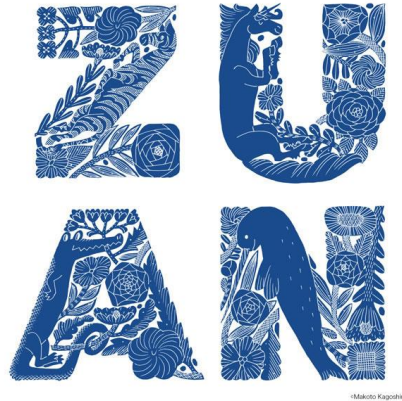
Fig. 4 A page from *The Scarecrow Fairy* and Fig. 5 Zuan Letters by Makoto Kagoshima

Fig. 6 Spelfabet for primary school children

Process of Making the Letters

- We made a repository of words starting with each letter keeping in mind the target audience's level of comprehension by digging through dictionaries and taking references from several Hindi *varnamala* (alphabet) books and children's storybooks to understand the level of comprehension.

- Initially tried to find a connection between the form of the actual object and the letter like ड से डगर. But this approach didn't work for complex letters like छ, भ, etc. so some objects' shapes had to be slightly manipulated to make the letter legible. For instance in the maatra in भु (for भुट्टा) had to be formed out from the skin of the corn cob.
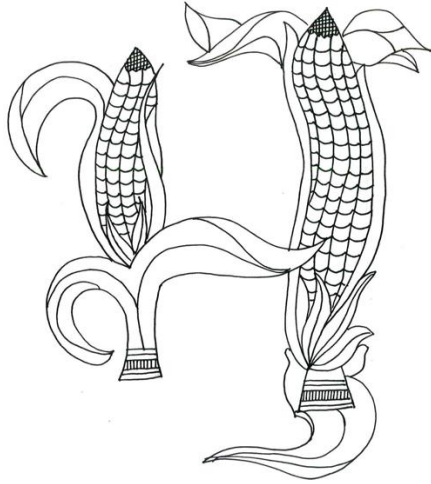
Fig. 7 भु for भुट्टा

- Due to the unique nature of construction in letters, each letter had to be approached differently.

In some cases, repetition of the same object didn't work like ढोलक or डमरू but seemed to work for words like खिलौने where different toys are lined together to spell खि or आ for आम since a Mango tree naturally has many mangoes in it (Fig.8).
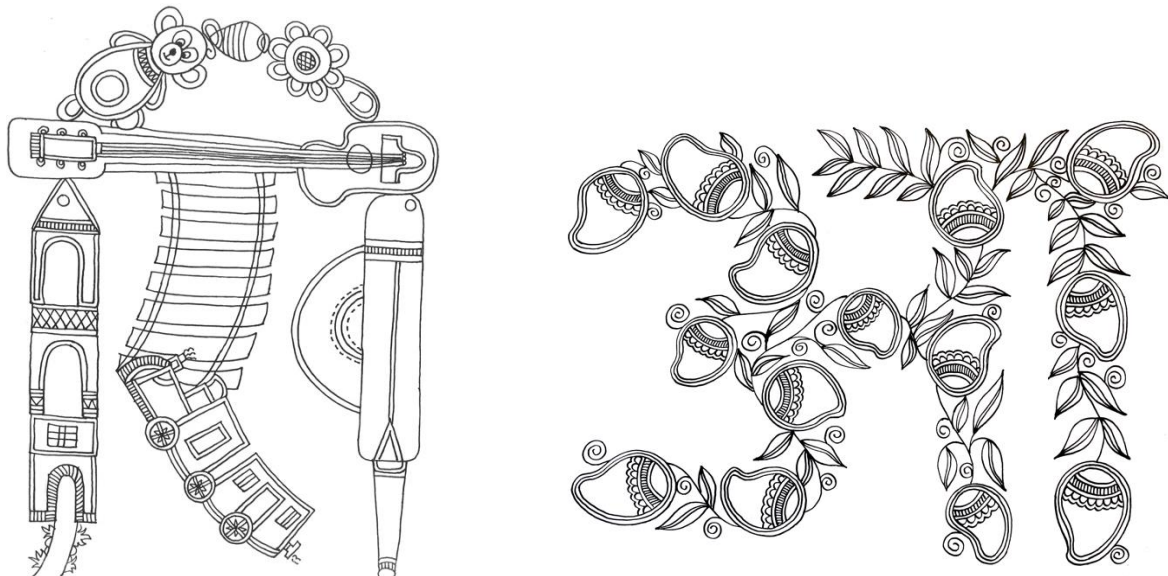

Fig. 8 Different ways of using repeating elements: खि /*khi* se "खिलौने/*khilone*" (toys) uses different toys while आ /*aa* se "आम/*aam*" (mango) repeats the mango as one would see on a mango tree.

- Devanagari script is perplexing to work with compared to Latin due to the complex structure of the former. Several elements in terms of the anatomy of a letter made

it difficult to incorporate objects into the letterform. For instance, the diagonal line inside the closed counter of ब (Fig. 9), the middle knot in भ, loops in letters like द or ध, etc.
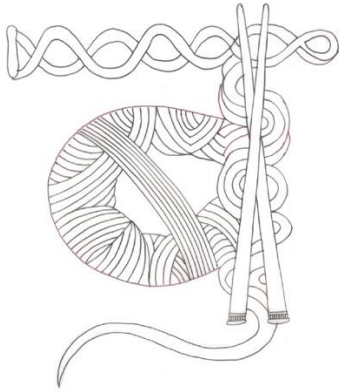

Fig. 9 बु (*bu*) se बुनाई (*bunai* or knitting)

- *Maatras* (diacritics) were very difficult to incorporate into the drawings. Especially the i (ई), au and the ao maatra (see Fig. 12 for the latter).
- After some rounds of rough sketches, it was apparent that these challenges narrowed down the options of words that could be illustrated in the form of a letter.
- It was important to make sure not to deform the object being drawn to fit it into the proportions of the letter and vice versa. But there had to be some level of abstraction to make the letter and the illustration legible and comprehensive.
- The illustrations needed to not be too ornate and decorative but instead sparse and simple to make it easy to decode/decipher for children and wide audiences.
- We avoided using vague words like *bhagwan* or abstract ones like *bharosa*. The use of some flowers and plants also didn't work as the drawings felt that they are just referencing a tree (perd) for instance (Fig. 10).
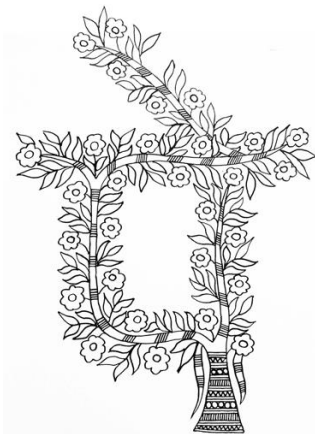
Fig.10 पे se पेड़ (perd or tree)

- It was important to make the artists sensitive towards the form of the letter as often their visually appealing drawings didn't end up making legible letterforms. There was some back and forth to discuss tweaks in drawings and ideas to improve upon each drawing which became tough especially during the COVID lockdowns as we had to work remotely via the internet. Some rough concepts and drawings were shared with the folk artists so that they could implement a similar concept in their style. But they often deformed the letter or didn't get the proportions right. That's where the design team intervened and helped them to correct the proportions of some of the letters.

- It is important to make the letters proportionate to some extent to encourage सुलेख

- Their understanding of being sensitive to the proportions and the letterform with a help of a reference image of the letter led them to make drawings filled inside the shape of the letter which was something we didn't want to go for. Hence, tweaks were suggested by the design team with reference images (Fig. 11).
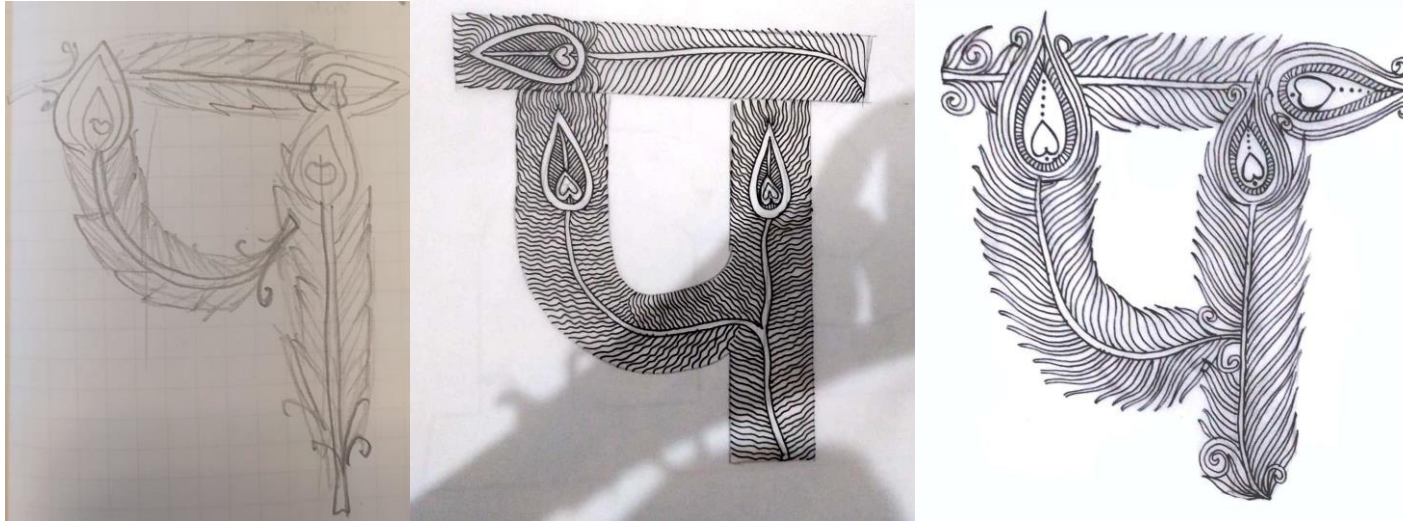

Fig. 11 The letter pa depicts three versions of the word *pankh* (fan). Left to right: going from a rough sketch to a letter drawn within a given shape and finally in the free form once again.

- We have used concrete nouns like इमली, चींटी, टमाटर, तोता, etc. with an exception of ठोकना (Fig. 12) and सिलना being action words/ verbs.
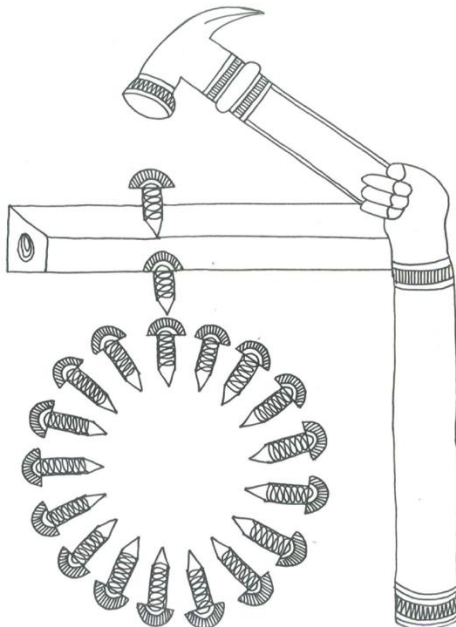

Fig. 12 ठो (tho) se ठोकना (thokna), or hammering.

Research and Observations

Our work has been reviewed and validated by professionals. They have been giving valuable input on the letters and content of the book.

Priyanka A. Singh, who is well versed with different vernacular language books meant for children, has been validating our ideas and helping us understand how to improve the Akshar-Chitra teaching aid to increase efficacy and engagement while maintaining proper Hindi grammar and diction expected of an educational tool. Swati Jawar, Delhi based Hindi teacher has helped us understand the needs of students in the urban demographic.

We conducted a field visit and research at Loka, a rural school based in Manikpur, Bihar in December 2021. The goal was to take the letters that are made in the Mithila folk art style of the same state to a non-urban area that is fluent in Hindi to test out the Akshar-Chitra kit with both teachers and students. The trip to Loka was about meeting experts like Sanath, a Sanskrit Scholar, and other teachers (Figs. 13 and 15) while also testing the material on students of different age groups to understand where the project can be improved and what was already working.

Fig. 13 Sneha, a teacher at Loka school critiquing the Hindi alphabet.

We discovered that this tool is not just relevant to learn the alphabet (varnamala) for kindergarten students, but that it can be used by children even up to Grades III and IV to

create their design of a letter based on the object(s) they want to describe within the letter (Fig. 14). And so, this then becomes a lettering or type exploration exercise for more senior students, while their juniors use it to learn the building blocks of language.

Fig.14 Madhu, a class IV student displaying her design for Ma in which she incorporates macchi (fish) and madhumakhi (bee)

Teachers found it extremely helpful as a tool to start a discussion with children about a letter and tell stories about the words that come from that letter. They said that this is a great starting point for them to challenge students to try out more letters on their own and for the students to be engaged by using the kit as a coloring book, for instance.

Fig. 15 Teachers at LOKA giving us feedback on the project (L–R: Doma Sherpa, Shilpi (student), Nancy Kejriwal, Sapunam and Ruby).

The teachers gave us several insights on what was working and what can be improved with the letters, which we have incorporated since. One of our dilemmas was whether to use old-fangled words like *ghari* (watch/clock) (Fig.1) for the letter *gha* or macchi (fish) for *ma* or if we should use more contemporary words like *ma se* mobile (mobile or cell phone). The response was that it was better to stick to the usual words, as the teachers and the students can always come up with new words to draw. One of them went on to say that Biharis are known for their love of a variety of river fish readily available in the region and that they can even ask the children to pick a fish and make a letter in the shape of that fish. They felt that the possibilities are many.

Challenges

- The drawings made by the artisans illustrating the words they describe are path-breaking because no previous examples for the same existed and some of the letters were so stylized that one had to distort or reshape the drawing almost forcibly to make it match the word. Even the ones that seemed easy had a level of abstraction that does not exist in children's books and drawings.

- "It was challenging to integrate the image into the form of the letter. It was my first time working on a project of this nature and many drawings took many rounds of approval because it was tricky to come up with the output that was beautiful and legible" Rekha Rani, one of the Mithila artists working on the project.

- Understanding the various challenges of teaching Hindi to primary school children both in rural and urban India, such as, awareness of sounds tends to be the hardest part of learning to read and spell, and the reason many children fail. This is why the kit also emphasizes the sounds of the letters.

- Some of the functional challenges include making the letters intelligible for young minds who are still learning the alphabet and yet including images of the reference words that are easy to pronounce and comprehend for primary school-age children. Some of the surprises were that older students (up to class IV) found the reverse assignment of interest. Much like a design project, they relished the challenge of creating a word just from one type of object or animal — such as the construction of म just out of fish (□□□□ /*machli*) as drawn by Madhu, a student. (Fig 14.)

Immediate Outcomes

The outcome of this project will be a is a tangible teaching aid in the form of a book and flashcards, that will be accessible across the immense Hindi-speaking primary education

market. While the main function is to teach the varnamala with the *swarn* and *vayanjan* (vowels and consonants) and the *barakhadi* (the 12 consonant-vowel pairing sounds), the secondary goal is to expose and sensitize both children and their teachers about Madhubani art (and folk art in general), its origins, myths, and traditional and contemporary applications. At the same time, the Akshar-Chitra kit allows for and encourages adaptability to educate children in art and craft content specific to their own culture as well as to choose new images to illustrate in the form of letters.

Opportunities
In the short term, we expect to see the following outcomes:

A.   Craftspeople

- **Increased awareness of the connection between crafts, design, technology, and livelihood creation.** An eye-opener for craftswomen to notice and comprehend the power of their crafts and skills and how those can be transformed into new mediums.

- **Increase in design skills** of craftspeople to be able to think of new and innovative ways to transform their crafts.

- Encouragement for artisans to be more **entrepreneurial and independent-minded** leaders by exposing them to new ways to think about their craft skills. For instance, by showing them our track record of how we have transformed crafts into digital typefaces, animations and media thereby both creating a cycle of livelihood and innovating the sector.

B.   Education
- The availability of technology to transform a handmade craft into the digital realm has been used to connect traditional craft with contemporary design creating more **engagement among students** to learn a language.

- **Teachers** across India can use the Akshar-Chitra teaching aid book (Fig. 16) as it gives them many ways to teach Hindi to children of different grades—from kindergarten to at least class III.

- **Schoolchildren** have been more engaged while using the Akshar-Chitra kit. This teaching aid reinforces teaching children to learn a language more effectivly and

holistically, and one that is linked to local contexts, culture, heritage, and folkloric narratives. Thereby imparting the importance of visual culture, and the arts in education.

- **Design Community**. We hope that this project would inspire more graphic and type designers and design students to work with indigenous knowledge, and know-how through crafts and apply that through typography or type design in areas such as primary education.

In the long term we would like to see the following:

A.   **Craftspeople**

- **Downloads, New Audiences, Sustained Livelihood through Royalties**. Making a significant number of sales translates to 50% of the royalties after break-even costs going back to craftswomen—creating a cycle of sustainable livelihood as well as gaining exposure to new markets and audiences.

- **Independent and Entrepreneurial spirit in craftswomen**. More craftswomen are interested in working with us to develop more types of teaching aids. They suggest ideas, think and make new products for diverse markets.

- **The cycle of change comes home**. We also hope that the daughters of the artisans, who learn the craft sitting on the laps of their mothers, can learn a language through the crafts of their mothers and perhaps even teach that language back to their mothers as they learn the crafts from them. Ultimately, artisans can only be entrepreneurial and independent-minded and be able to directly seek new markets, if they can read and write.

B.   **Education**
- Increased Sales and Scale. Interest amongst parents and schools across Bihar and the Hindi-speaking belt in both rural and urban India to purchase the Akshar-Chitra teaching-learning kit.

- It has the potential to add Social Education to the existing curriculum. Creative pedagogies like these also encourage educators to challenge conventional ways of thinking.

- The educational kit aims that the classrooms are rooted in inquiry-based learning, local learning, and interdisciplinary methodologies.

C.   Linguistic Variations

- Akshar-Chitra can be scaled up to be used to teach other vernacular regional languages. Ideally, each region in India could have a variant of this teaching aid, made with a local craft from that very region, to not only support local cultures but as well as craftswomen in more parts of the country. This also provides children with a unique cultural context while learning a language. For instance, we plan to work with Toda embroidery (for the Tamil alphabet) in the South, with Phulkari (for the Gurmukhi alphabet) in the North, with Pakko embroidery (for the Gujarati alphabet) in the West, and with the Kantha stitch or Pattachitra art (for the Bengali alphabet) in the East.

Conclusion

Education in terms of form and content in India to date has been dominated by the West——particularly by the UK and the US—with an emphasis on content being available in English. By creating a product that addresses local communities in their language, and employing their local crafts and culture to engage with learning, this project brings ownership of design and content back to the local community.
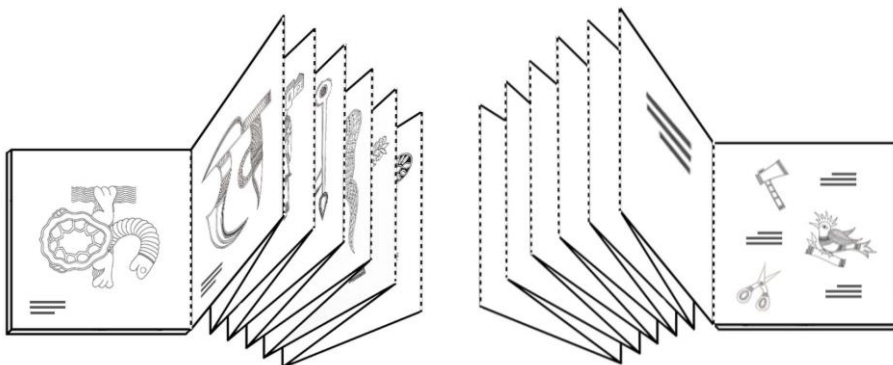

Fig. 16 The Akshar-Chitra book mockup with perforated pages for ease of use by teachers in the classroom. Each letter is supported by 12 barakhadi (consonant-vowel combinations) on the flip page to make this a comprehensive teaching aid.

The idea is not just to create pride in one's culture but to give children (and more importantly educators) teaching tools that are relevant, easy to understand, and flexible enough to be able to use in a range of classroom situations (Fig. 16).

Acknowledgment

Notes

i.   Pinker, S. (1995) The Language Instinct, p. 265. Harper Perennial. "A newborn has a vocal tract like a nonhuman animal".

ii. Elbow, P (2017) Landmark Essays on Speech and Writing, p.9. Routledge.

iii. Darian, S. (2016) Review of *Landmark Essays on Speech and Writing*, by P. Elbow. Technical Communication, 63(2), 177–178.
     Available at http://www.jstor.org/stable/44809664 [accessed October 2022]

iv. Ehri, L. C., Deffner, N. D., & Wilce, L. S. (1984). Pictorial mnemonics for phonics. *Journal of Educational Psychology, 76*(5), 880–893. Available at https://doi.org/10.1037/0022-0663.76.5.880 [Accessed October 2, 2022]

v.   Clark, J. M., & Paivio, A. (1991) Dual Coding Theory and Education. Educational Psychology Review, 3(3), 149–210. Springer.
     Available at http://www.jstor.org/stable/23359208 [accessed August 6, 2022]
     The Dual Coding Theory proves that using images and text has an additive effect on what one recalls, increasing the chance of remembering.

vi. Pinker, S. (1995). The Language Instinct. p.266. Harper Perennial.
     "50% of first words uttered by infants are objects".

vii. Atzmon, L. (1996). Typography in a Brave New World: Theo van Doesburg's and Kurt Schwitters' Scarecrow Fairy Tale. *Design Issues* Vol. 12, No. 3 (Autumn, 1996), pp. 14-34 (21 pages).
     Available at https://www.jstor.org/stable/1511700#metadata_info_tab_contents [accessed November 1, 2022]

viii. Based on recorded interviews with Loka faculty and students in December 2021.

Definitions

*re·bus / ˈrēbəs/
• n. (pl. -bus·es) a puzzle in which words are represented by combinations of pictures and individual letters

(Available at: https://www.encyclopedia.com/philosophy-and-religion/other-religious-beliefs-and-general-terms/miscellaneous-religion/rebus)

*The term rebus comes from the Latin phrase non-verbis, sed rebus, which means "not by words, but by things."

Further Reading

Michaud, M., Dion, E., Barrette, A., Dupéré, V., and Toste, J. (2017). Does Knowing What a Word Means Influence How Easily Its Decoding is Learned? Reading & Writing Quarterly - Overcoming Learning Difficulties Volume 33, 2017 - Issue 1.

https://www.tandfonline.com/doi/full/10.1080/10573569.2015.1092003?scroll=top&needAccess=true