



Typography and Diversity

<http://www.typoday.in>

Typography and Diversity in the Process of Learning

Typographical transition in a child's early reading stage

Author: Anitha. B, English Learning Foundation, Chennai, India, anitha.vb@gmail.com

1. ABSTRACT

This paper provides an insight into the importance of font consistency for small children and beginning readers in the English Language. In the early years of life, a child has an exposure to print typeface at home, but soon is introduced to the cursive representation as soon as he/she enters primary school. Most Indian schools lay a lot of unnecessary importance on introducing children only to the cursive way of writing letters. However, all their textbooks and workbooks are in print typeface. In this paper, we will first examine the problems faced by young children and beginning readers due to inconsistent font usage in early learning material, and how sensitive children are to font style, size and spacing. Second, the paper examines the importance of maintaining visual consistency of content throughout the design, illustrations and fonts across different media, especially for beginning readers and young children. Third, it examines the relationship between effective visual presentation of content and learning outcomes achieved by children.

Keywords: *Education, typographical transition, child friendly font, legibility, early readers, cursive to print, font consistency*

2. INTRODUCTION

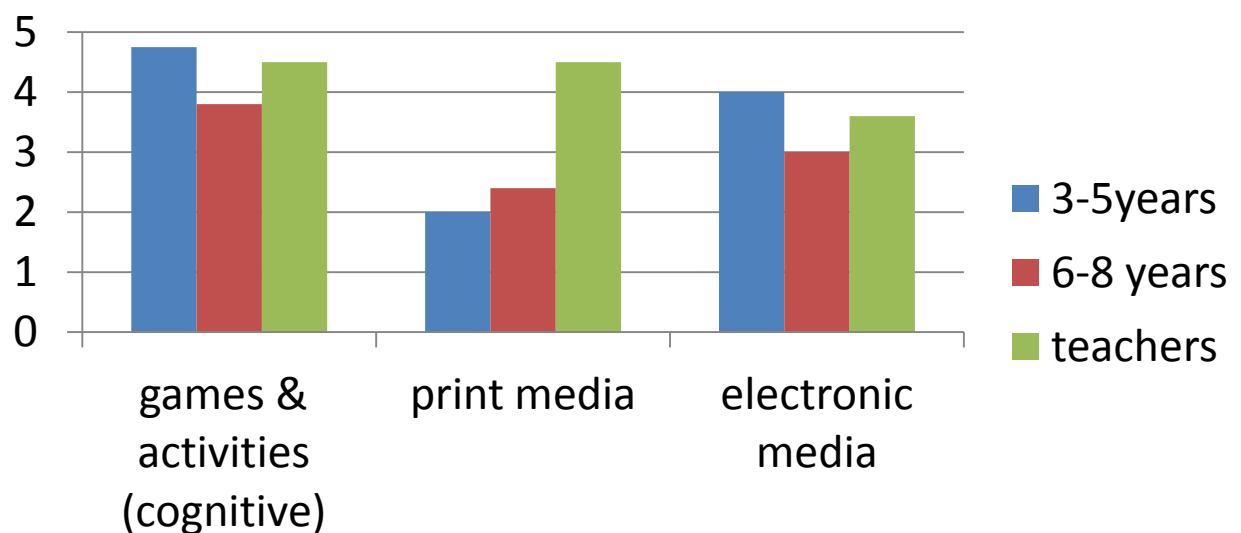
The field of education is constantly upgrading and developing along with technology. From the age of 1 year children grow up with constant exposure to content through various media. Despite rapid development in the efficiency of eye movements, by the time children enter school eye-movement patterns remain significantly less efficient than those of adults (Kowler & Martine, 1982). According to Tinker (1963), it is not until the fourth grade that legibility for children parallels that of adults because it is at that age that oculomotor patterns stabilize. Understanding children development of hand-eye coordination conjunctive with fine motor skills in accomplishment of tasks, in this case reading and handwriting.

Children catch up on their native vernacular easily given it is their language at home. Being a vernacularly diverse country English has also been recognized as a primary

language at home and for education. The objective of English Learning Foundation (ELF) is to ensure that English language reading, writing and speaking skills reach a large number of children irrespective of socio-economic background.

Fonts, colour, shapes and patterns are vital for designing content for children which counter balances their legibility and readability skills. Debra Levin Gelman, Design for Kids, states that, in just 6 months a 2 year old experience significant cognitive, motor and technical growth, while an adult's skills in these areas remain pretty stable. It is important to keep these changes in mind as you develop sites and games that can grow with your audience. Also while adults usually have a clear end goal in mind when they use an interface, kids are in it for a journey.

Statistics of understanding media preference among students and teachers for devising an effective tool of study, based on analysis for devising an effective tool of study based on analysis from a sample school, Eureka School, Koovathur, near Kalpakkam, Tamilnadu, India.



It is important to understand these developmental changes in presentation of content for children and the effects it would have on their reading capabilities.

3. ABOUT: English Learning Foundation (ELF)



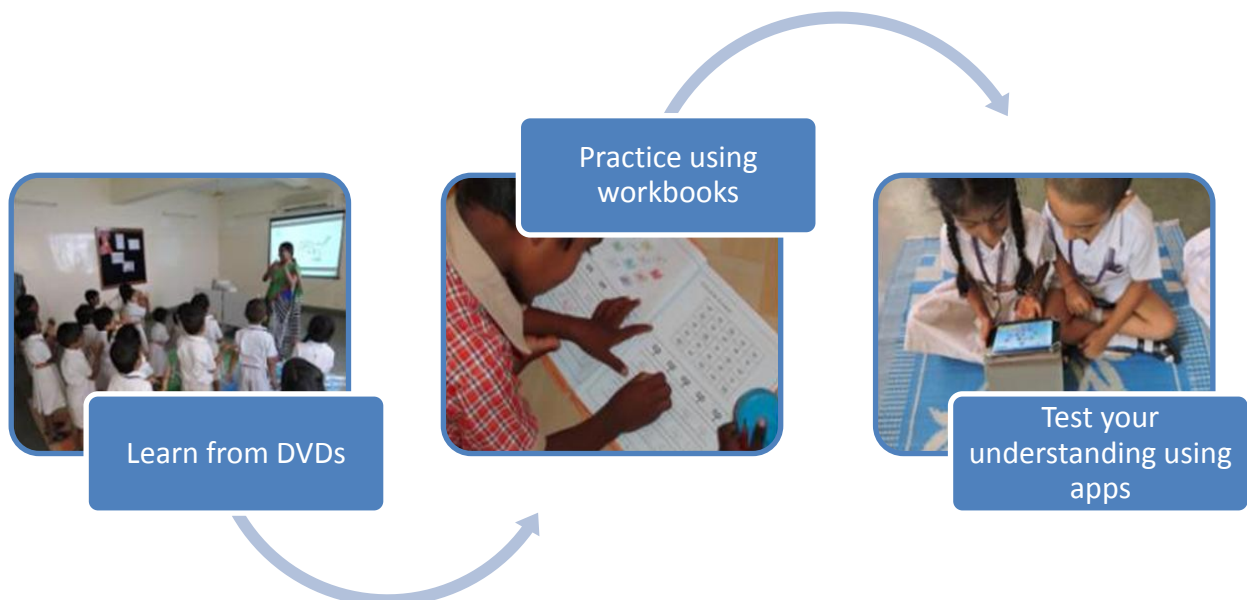
English Learning Foundation (ELF) is an organization for promotion of English language learning in Tamilnadu, India. The objective of ELF is to ensure that English Language skills reach a large number of children, both in urban and rural areas. ELF follows a research based methodology to develop learning materials like workbooks, story books, interactive educational kits, DVDs and mobile apps to help children read and speak

English. We field test all our materials with children and incorporate the feedback to improve the quality and content of our materials.

As a designer at ELF along with content field test we also test and observe how children identify and read various fonts across pre-school to primary. At ELF we have begun to give equal importance to fonts and as a result of using a right font not only help improve children reading skills but also on production efficiency.

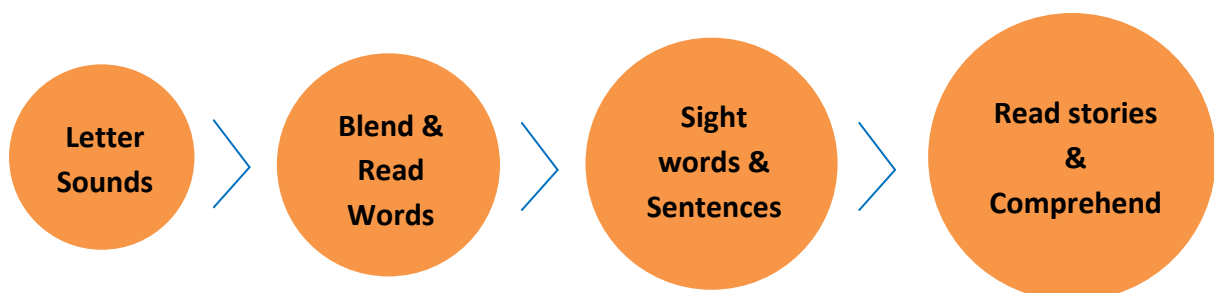
What is the aim?

READ > COMPREHEND > SPEAK



How is it done?

Graded steps to reading using phonics



ELF Graded Levels

What are the steps to learning to read?

L 1	Uppercase Letters	(Names, Sounds, Beginning Sounds)
L 2	Lowercase Letters	(Names, Sounds, Beginning Sounds)
L 3	Three-Letter Words	(CVC words ex: map, bet, sip, pot, fun)
L 4	Sight words and Sentences - 1	
L 5	Paragraphs with comprehension	
L 6	Four-Letter Words	
L 7	Sight words and Sentences - 2	
L 8	Stories with comprehension	

4. BEGINNING READERS

Analysis of various textbooks used in schools for pre-school

“Children are the research and development division of the human species.” - Gopnik



In the rural regions, Tamilnadu School Education Department (TSED) or also known as Government Schools are the most prevalent scope for education based on Samacheer Kalvi syllabus. **Samacheer Kalvi** (Equitable Education System) uniform system of school education was implemented by Tamilnadu Uniform System of School Education Act 2010 which paves way for quality education to all children without any discrimination based on their economy, social or cultural background. The new system of education was introduced for classes I to XII in the 2010 academic year, en.wikipedia.org/wiki/Samacheer_Kalvi, fig1.2: a samacheer kalvi textbook for std 5.

The samacheer kalvi system begins from primary and as a bridge between pre-primary and primary balwadi system had been introduced. **Balwadi** is an Indian pre-school run for economically weaker sections of the society, either by government or NGOs.

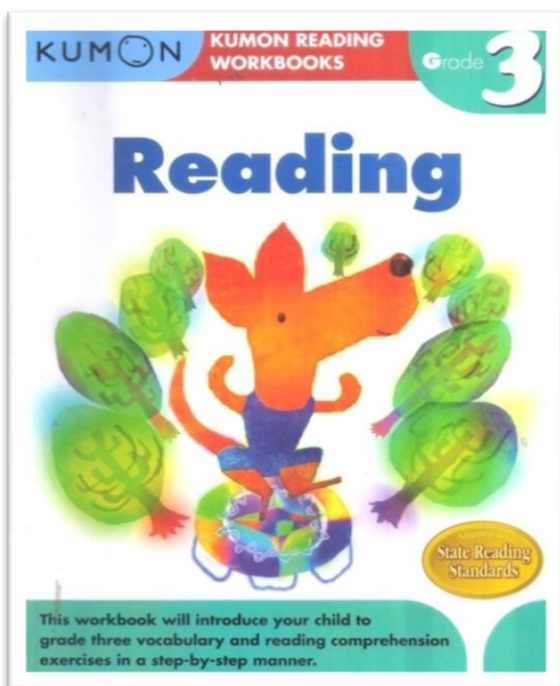
What began as a content development for constructive educational materials for kindergarten at Eureka Schools and other NGO aided balwadis, ELF now specializes in development of wholesome educational materials across various media making 1st grade easier, *fig 1.2*.



Fig 1.2, ELF workbooks, phonics storybooks, flash cards and dvds

Some of the other publishers who also specialize in educational textbooks.





2 Suffixes

Class: / / Name: / / Score: /

1 Trace the words in the example. Then complete the sentences by using the correct form of the word in the box. Add -er or -est as needed. 5 points per set

fast

(1) A zebra is a fast runner.

(2) A lion is a faster runner than a zebra.

(3) A cheetah is the fastest of the three.

high

(4) The branch on the tree is _____.

(5) The kite is even _____.

(6) The cloud is the _____ of the three.

young

(7) Jenna is _____.

(8) Her brother is _____ than she is.

(9) Her baby sister is the _____ in the family.

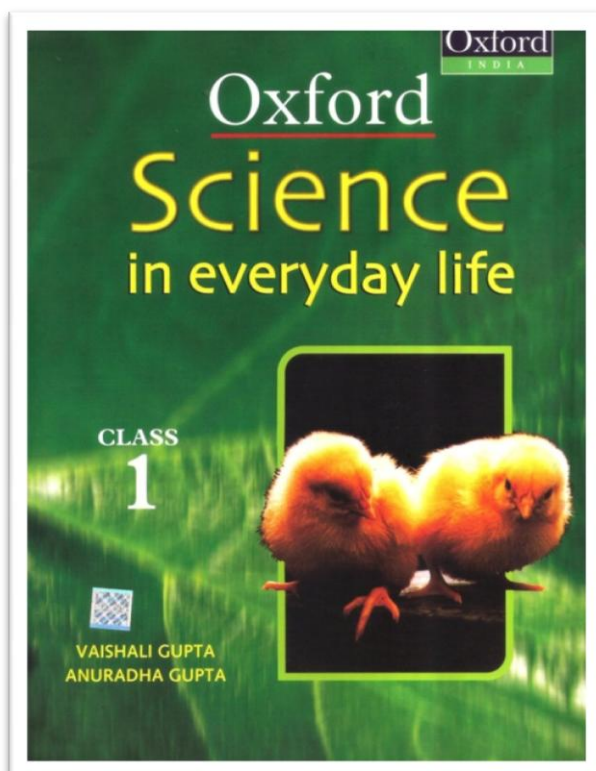
Don't forget!
An adjective describes a noun. Adding -er to the adjective means "more than."
Adding -est means "the most."

2 Choose the correct person that matches the description. Write the correct letter in the space provided. 7

Patty is taller than her brother.
She is not the tallest of the three children. ()

A B C

© Pearson Publishing Co., Inc.



Non-living things cannot breathe, move on their own, eat food, feel, grow and reproduce.
A chair, ball, bat, pen, etc., are all non-living things.

Write names of five non-living things other than the ones given above.

1. 2. 3.
4. 5.

NATURAL AND MAN-MADE THINGS

Some non-living things like water, wood, and rocks are found in nature. These are not made by man. These are called **natural** things.

Water Wood Rocks

Non-living things like paper, pen, train, house, and clothes are not found in nature. These are made by man. These are called **man-made** things.

Paper Pen Train House Clothes

18 Science

5. OBSERVATIONS

As a designer at ELF along with content filed test we also tested and observed how children identified and read various fonts across pre-school to primary. Some of the key observations were:

- Sans serif fonts were easier to read and identify than serif fonts.
- Children were able to read English easier compared to their vernacular but results were vice versa when they had to engage in a conversation in English and vernacular.
- Irrespective of fonts there were common characters identification and differentiation issues. *Fig 1.3*



Fig 1.3, flash cards with various fonts showing lt, ill, ltl btd for testing of character recognition for double letters and three letter words

- Ligature features were observed to make characters unrecognizable.



- Readability of printed text and app games were more intuitive than DVD videos.
- Combination of text and colours had diverse effects in the cognitive process of identification and reading. *Fig 1.4*
- Children find spacious books with bigger point size of text less intimidating.
- According to Tinker (1963) uppercase letters are more readable than lowercase letter when presented individually.
- Attention span of children is much lower in comparison to adults especially with text in motion. Nominal speed based on understating of eye stability development and their ability to follow text in motion while playing a video or in an app.
- Comic sans has been widely used by many publishers government and private as well as in electronic media.
- Text presentation, especially in the format of flash cards using sans serif fonts misinterpretation of words like **bud** as **dub** (*reading right to left*), **pop** as **bob** (*reading upside down*),
- Adding too many “designer” touches or illustrations to content presentation to make the content less boring for children has been observed to be more distracting.
- Practice of cursive writing is very popular in pre and primary schools in India. While children learn to read and write using cursive form, all their educational materials are in print form. This results in confusion in the child’s mind. *Fig 1.5 and 1.6*

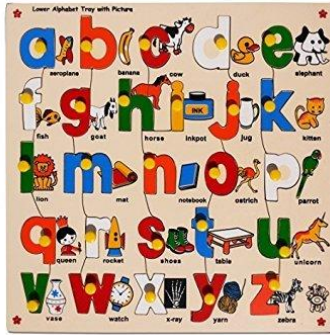


Fig 1.4, cognitive games for pre-school students

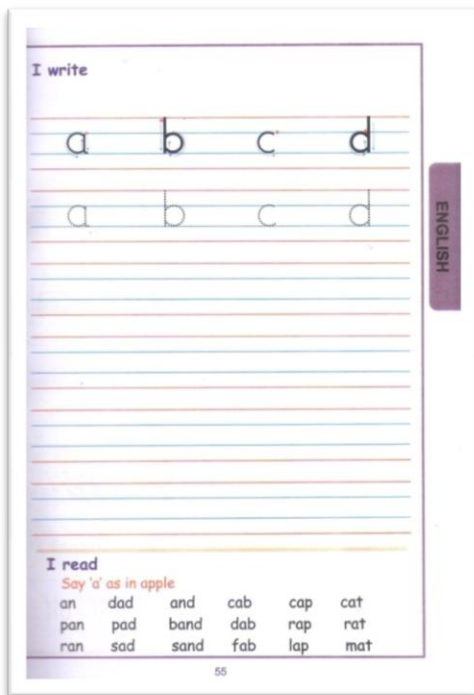


Fig 1.5a
Samacheer Kalvi's alphabet writing practice page

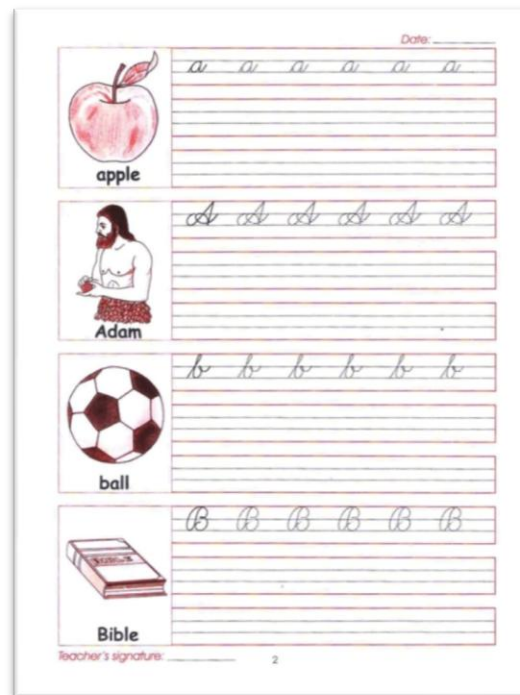


Fig 1.5b
Janet Publishing's cursive writing practice page

6. ELF FONT

- Analysis of different font and families
- Testing and ascertaining
- Elf font characteristics and development
- Adaptability across media

Analysis

Font	Corners	X height	Extenders	Body	Bowl	Stroke
Arial	Sharp	Large	Short	Wide	Normal	Uniform
Comic Sans	Rounded	Medium	Medium	Wide	Medium	Uniform
VAG Rounded	Rounded	Medium	Medium	Narrow	Narrow	Uniform
Calibri	Rounded	Small	Medium	Narrow	Narrow	Uniform
Clement	Sharp	Small	Short	Wide	Large	Polymorphic

Table 1.1a: Sans serif

Font	Serif	X height	Extenders	Body	Stroke	Bowl
Times New Roman	Thin	Medium	Short	Narrow	Thick & thin	Narrow
Chaparral Pro	Slab	Small	Tall	Medium	Uniform	Medium
Calvert	Thick slab	Large	Short	Wide	Uniform	Wide

Table 1.1b: Serif

Table 1.1a and 1.1b selective font characteristics were tested among children.

Testing & Ascertaining

Subsequently based on our results from stage one analysis serif fonts had been obviated which advanced to testing individual alphabets of different sans serif fonts. Alphabet clusters of similar attributes were tested to identify if there were difference in legibility between rounded and sharp corners in sans serif fonts. (fig 1.8)

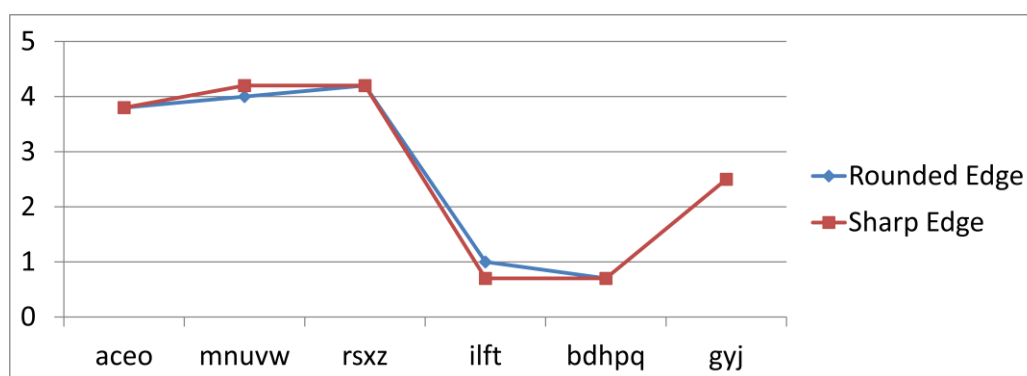


Fig 1.8

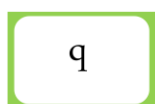
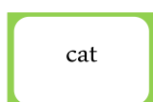
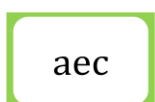


Fig 1.9a



Fig 1.9b



Discernability between rounded and sharp corners were almost similar when children shown alphabet clusters for identification and discrimination. Flash cards were shown first with single alphabets (fig 1.9a), double letters (fig 1.9b) and

three letter random letter clusters and three letter words (*fig 1.9c & fig 1.9d*).

Font Characteristics and Development

The last and final stage was to develop a font based on our analysis. One of the primary purposes of ELF educational materials is to bridge the syllabus gap between kindergarten and primary school. Samacheer kalvi, is the syllabus format followed in government and private state board schools for which another step of typographical and design scrutiny was required and the observations based on their English medium syllabus textbook from Grade 1 to 5 were,

- A grade 1 English textbook section one begins with introduction to alphabets, words and sentences using Comic Sans at variable point sizes and from section 2, 3 and 4 beings to use Arial, combination of Comic Sans and Arial with introduction of Times New Roman for pull quotes and use of Times New Roman fonts respectively. (*fig 2.0*)
 - Students are taught to practice writing use print form.
 - Extremely tight and crowded layout.
 - Minimal writing space. From the age of 2-6 years children are developing their motor skills and their little clumsy hands need optimum space for them to write freely.
 - Within page drastic variations of point sizes irrespective of content hierarchy.
 - Misregistration in printing also obstructs and distracts a child's reading process.
- (*These observations were made based on fig 2.0a and 2.0b grade 1 Samacheer Kalvi school textbook page*)



fig 2.0a

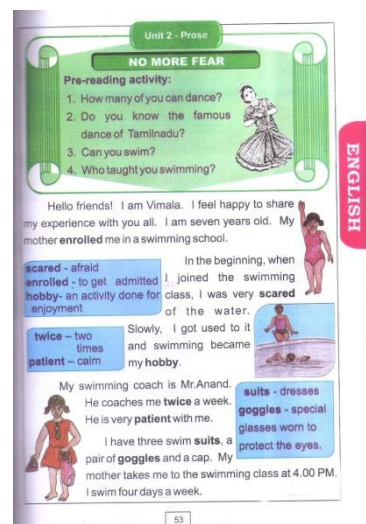


fig2.0b

Many studies have examined the effects of variations in typeface characteristics on legibility and readability. Difference in font increase or decrease the ability of an individual to distinguish or read letters (Tinker, 1944). However, under certain conditions,

variations in font characteristics may particularly influence the legibility of letters. For example, legibility may be compromised due to presentation factors, such as when one uses faster rates of presentation, smaller letters, greater distances, poorer graphic resolutions or contrasts, or inadequate illumination (e.g., Legge, Rubin & Luebker, 1987; Mansfield, et al., 1996)

Based on the observations (*fig 2.0a, fig 2.0b*) extremely small or long extenders with wide and large bowl has lower discrimination rate. The characteristics of a distinguishable letters were,

- Medium bowl and x-height
- Uniform stroke
- Moderately long extenders
- Spacious kerning

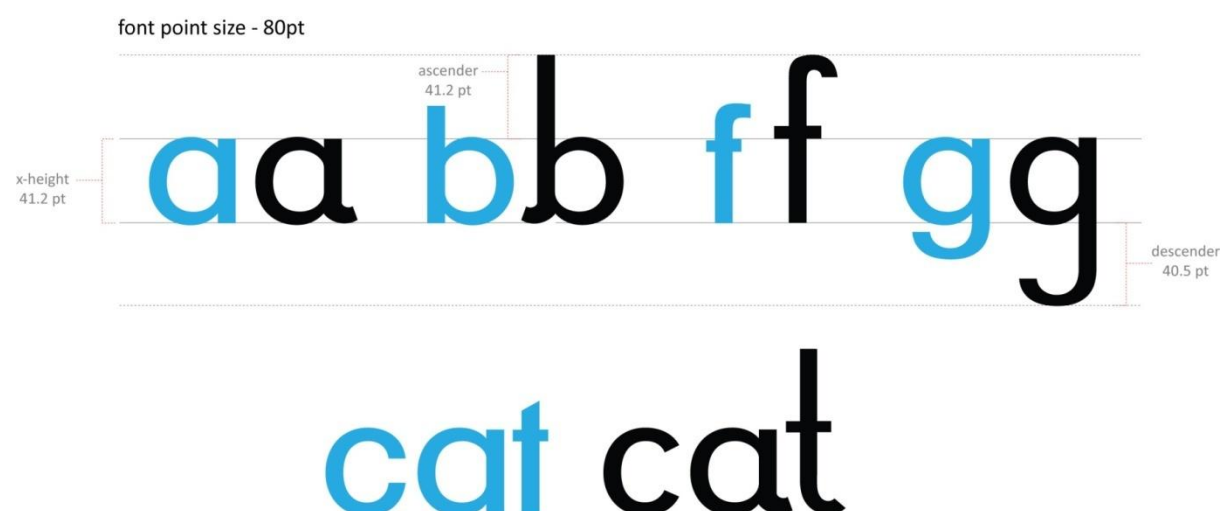


Fig 2.1

Though the educational content of Samacheer Kalvi books have been appropriately devised to make English as a language easy for children especially in the rural segments has suffered legibility and readability issues owing to improper print production in comparison to the books published by private publishers. As a visual bridge between Samacheer kalvi text books and ELF text books we had also adopted **Comic Sans** as one of the fonts in use, but the discernability issues persisted which led further into development of a customised font.

Systematically studying specific characteristics of a font such as stroke width or the use of serifs requires manipulation of individual characteristics while holding others constant, *Effects of Typeface and Font Size on Legibility for Children, 2005*. Use fonts that approximate how children learn to write. For example, many fonts use “a” and “q” in the variants that do not match how some children are taught to write those letters.

G G

Alphabet **G** has been modified to match the written style children are taught in school.

I I

Alphabet **I** has been modified to clearly differentiate between capital **I** and lowercase **i**, for eg.; **Ill**

J J

Alphabet **J** modification clearly distinct capital **J** from lowercase **i**, for eg., **Jill** or **JILL**

Q Q

Alphabet **Q** has been modified to differentiate **Q** from **o**

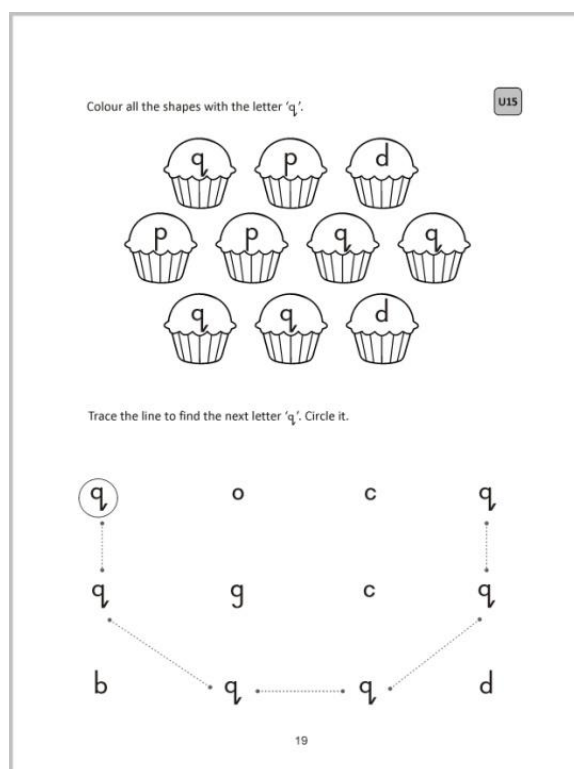
a b c d e f g

h i j k l m n o p

q r s t u v w x y z



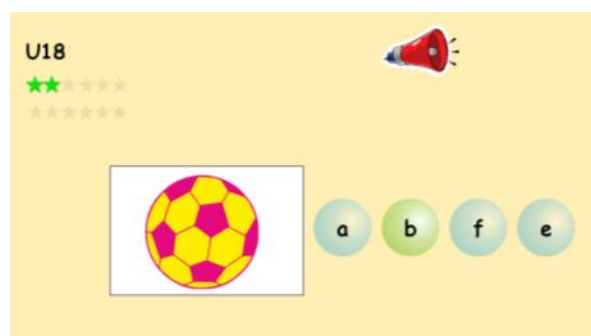
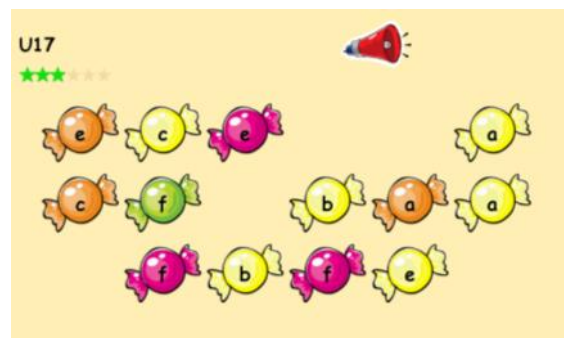
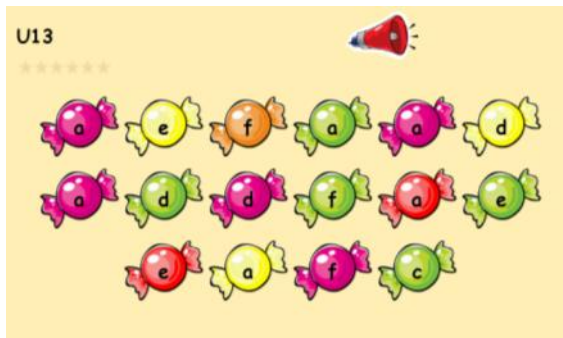
ELF graded workbooks. In workbook 1 - Uppercase Letters we chose **Calibri** font as it required less modifications. Specific alphabets were modified to match the way children write to help resolve discernability issues at primary phase.



Which kind of 3-Letter Words will the child read in this level?

CVC = Consonant – Vowel – Consonant

b e d



7. CONCLUSION



Similar to designing for adults, designing for kids requires a strong understanding of your users and what they need and want. However, what differentiates designing for a child audience and as adult one is that children change really quickly. In just six months, a 2 year-old experiences significant cognitive, motor and technical growth. (*Design for Kids, Debra Levin Gelman's*)

It is necessary to be extra cautious while designing a typeface for children as this influences how they comprehend and learn to write. Direct and clear, as children are still learning to think abstractly their design has to be easily approachable. Simple, structured and graded, as our conscious decisions as designers would nurture their development cognitive process of understanding written content.

8. REFERENCES

Design for Kids by Debra Levin Gelman

American Journal of Psychological Research, Vol1, no.1, 2005: Effects of Typeface and Font Size on Legibility for Children, Rebecca J.Woods, Kristi Davis and Lauren F.V Scharff, Stephen F, Austin State University

<http://www.textbooksonline.tn.nic.in/>

https://en.wikipedia.org/wiki/Samacheer_Kalvi

<https://www.psychologytoday.com/blog/freedom-learn/201002/children-teach-themselves-read>

All field tests were conducted with students from Eureka School, Walodai, Kalpakkam, Tamilnadu, India and also on children from Thiruporur and Royapettah, Tamilnadu, India