Learning Aid for Illiterates

Degree Project

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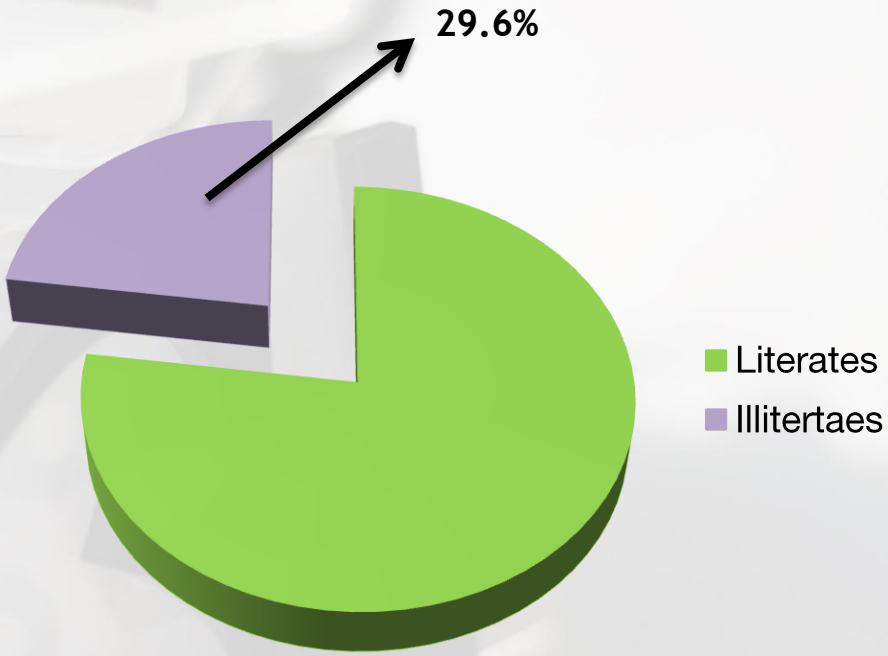
Introduction - Facts

Facts

- 269.8 millions people Illiterate in India
- 30% of Global Illiterates
- Current literacy rate in India is 66.0 %*



*2007 figures estimated by UNESCO Institute for Statistics in September 2008

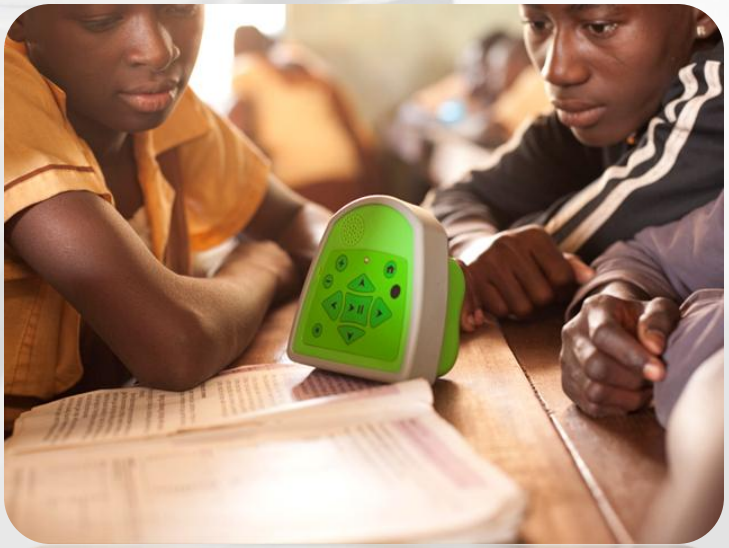
Research - Existing Services

Jan Shikshan Sansthan

- Government Organizations
  - JSS
- NGO's
  - Vidya
  - Pratham

Research -Existing solution

TCS- Computer-Based Functional Literacy (CBFL) program



The Talking Book Project

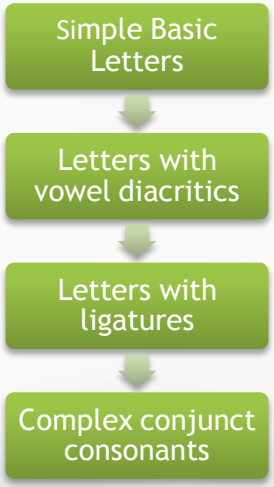
Research - Theory

Paulo Freire, Pedagogy of the Oppressed

"Education which fails to recognize the highly educational role of righteous anger that protests against injustice... against indifference, against exploitation and violence, is wrong."

- Stage one: Study of the Context
- Stage two: The Selection of Words from the Discovered Vocabulary.
- Stage three: The Actual Process of Literacy Training.

Research - Theory



Literacy in Devanagri

The Psycholinguistics of Indic scripts

Processing of akshara is partly syllabic and partly phonemic

For example in the word कि that is pronounced /ki/ but written /ik/

Organizing the symbols

- Organized based on its phonetics
- Vowels and consonants are separated
- Vowels are arranged by vowel length (short followed by long)
- Consonants are arranged by place and manner of articulation; for example, /k/ and /g/ are placed on the same row because they differ only in voicing

Research - Theory

Literacy in Devanagri

Reading Material

Material 1: Sounds of alphabets, then taught how to put letters together into syllables, words, sentences and paragraphs.

Material 2: User learned words which they could recognize on sight.

Material 3: Whole language approach which emphasized reading in context.

Material 4: Functional Literacy

Research - Preliminary Field Study

Barriers in Learning

- Time
- Interest
- Information about opportunities to learn
- Family Commitments
- Feeling of "inferiority" to the teacher, who, in most cases are his peer or younger
- Unfamiliar vocabulary in teaching material
- Learnt material not put to immediate use
- Formal set up of a classroom

Research - User Study

Literacy Classes for 15 Days

Individual

No of Student: 1 (32 year Old Woman)

Hours :-20-40 mins

Education: No formal education, knew few letters.

Method: NLM Book (Started with consonants and ‘matras’ from first day)

Group Class (JSS+Vidya)

No of students: 15-25 people

Hours :-60 mins

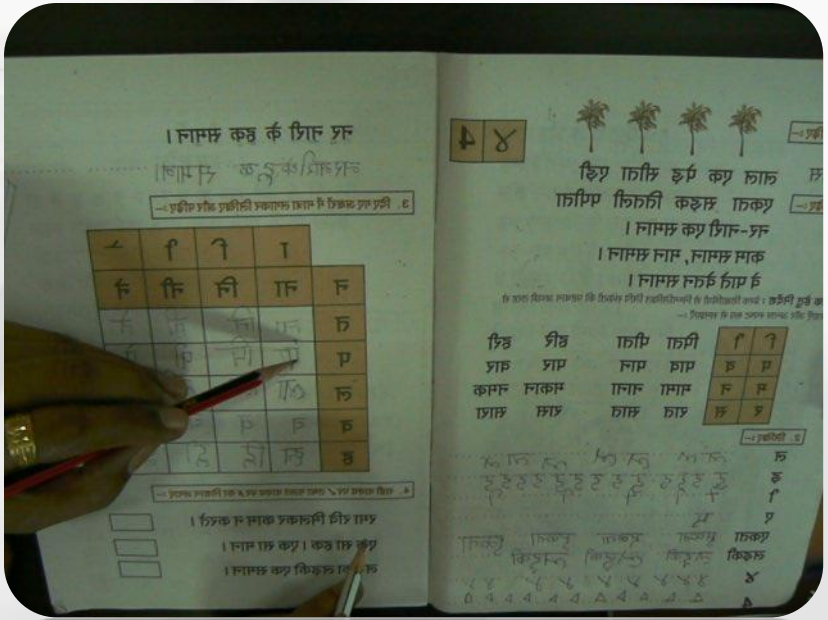
Education: None to 9th Standard

Method: Vowels without books and then the teacher moved to NLM books with consonants.

Research - User Study

Content:

- Letters
- “Matras”
- Words
- Sentences



Research - User Study

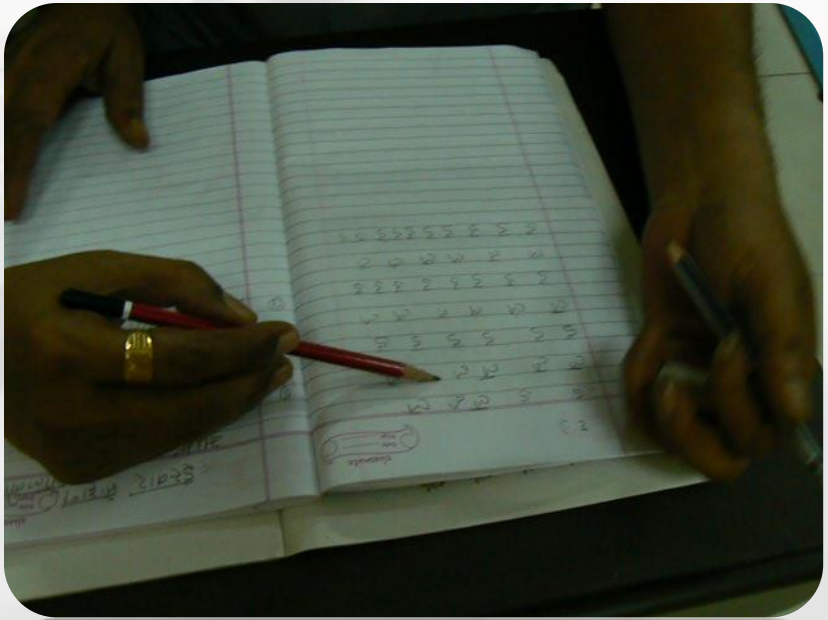
Facts

- Hard to remember letter shapes.
- Hard to remember ‘matras’.
- Easily relate to pictures and word association.
- Learning words from combining letters takes longer time.

Research - User Study

Ideas that work

- Few letters and then words
- आ से आम and इ से इमली
- Personalization. For example हेमा and her husband's name was रवी, their profession related, everyday used objects, religion etc
- Interesting content and not boring.



Ideas that don't work

- Similar looking letters confused user.
- Just varnamala.

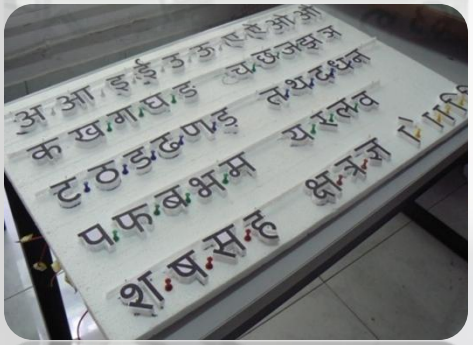
Research - User Study

Users needs:

- Users need for learning
- Immediate effects of the learning
- Encouragement
- Interactive session
- Motivation
- Company
- Continuous feedback.
- Need Practice-User need to be repeated that her learnt earlier.
- Friendly and known environment.
- Don’t force to speed up.
- Not to loose interest in the learning process.

Initial Experiments

Learning with the help of Tangible letters

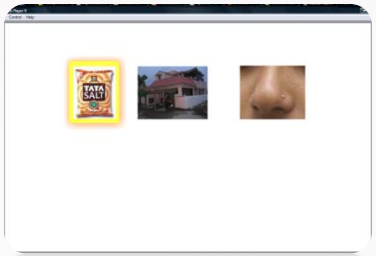


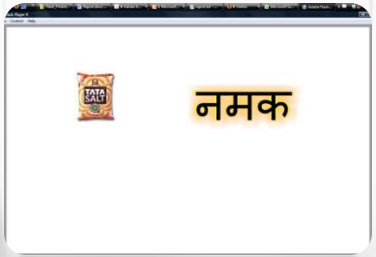
Findings:

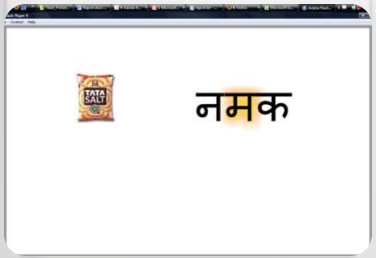
- Differentiate similar looking letters e.g. घ and ध
- Were not afraid to pick up letters to move and play with them.
- In group users were helping each other in forming word.

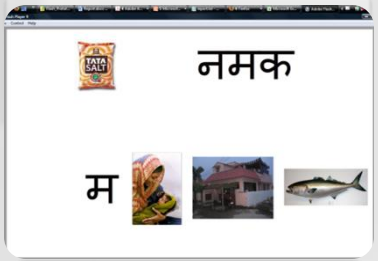
Initial Experiments

Screen based learning









Findings:

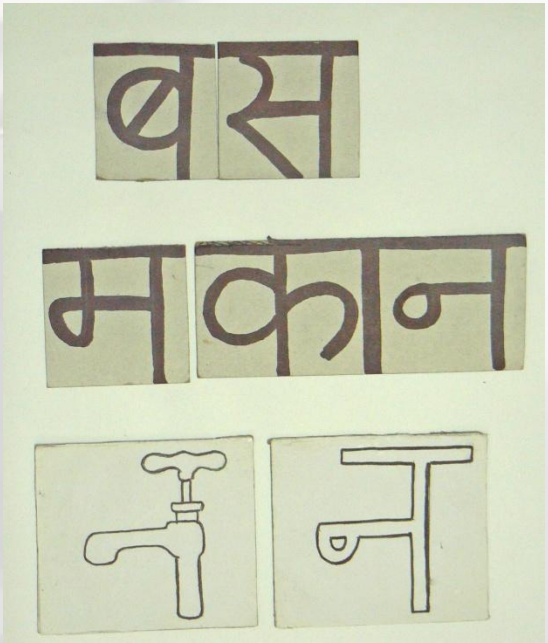
- User could easily point out the letter forms shown on screen.
- User could remember the phonetics.
- User could remember the pictures associated with the phonetics

Initial Experiments

Voice to text learning device

Initial Experiments

Teaching Methodology Research and Experiments



Insight Analysis

- No one methodology
- Combination of letters and words would be used to teach.

Ideation - Approach

Learning Mode - To be learnt in class

- Letter association with similar looking picture.
- Similar looking letters taught together.
- Teaching “matra” by teaching words
- Swapping of letters to teach letters and words.
- Learn new word from the subset of the word.

Practice Mode – To be practiced at home, between classes

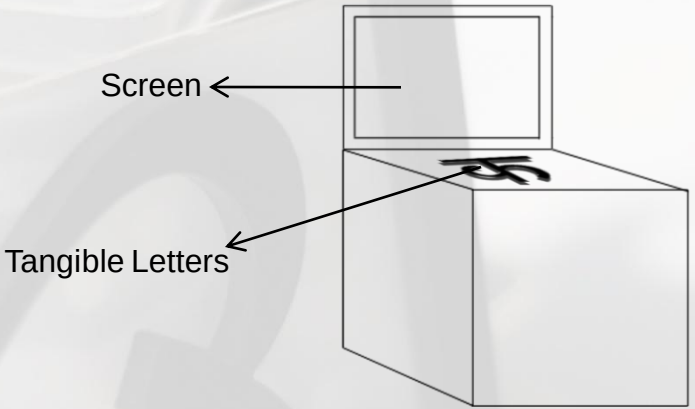
The mobile game

Initial Ideation - Learning Mode

Tangible letters

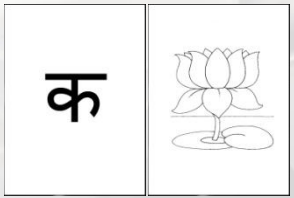
Benefits

- Touch and understand the shape of letter
- Reducing involvement of mediator
- Technology a motivational factor
- Personalization of product
- Opportunity to become collaborative learning



Initial Ideation - Practice Mode

Memory Game



Initial Ideation - Practice Mode

Brick Game

Fish Game

Tetris Game

Final Concept - Keywords

- Tangible Letters
- Motivational
- Interactive system
- With or without teacher/mediator
- Feedback
- Read
- Personalization

Final Concept - Learning Mode

Tangible Letters

Learning Letters

Final Concept - Learning Mode

Tangible Letters

Learning Matras

Final Concept - Learning Mode

Tangible Letters

Learning Words

Final Concept - Learning Mode

Tangible Letters

Learning by swapping letters

Final Concept - Learning Mode

Similar Looking Letters

Final Concept - Practice Mode

Memory Game

Final Concept- Lesson Plan

Sequence of letters

- Clusters based on Frequency
- Shape Similarity

Group	Devanagari Symbols
1	व, क, ब
2	र, ख, स
3	त, ल
4	च, ज, अ,न
5	ग, म, भ
6	ण, प, ष, फ
7	घ, ध, छ
8	श
9	य, थ
10	ड, ङ, ड़, झ
11	ट, ठ, ढ, ढ़, द
12	ह

Personalization

- Familiar Names e.g., family member, friend etc
- Frequently Visiting Places e.g., Dadar
- Famous Places e.g.,
- Words from famous serials
- Famous brand names e.g., TATA
- Everyday used objects
- Work related words
- TV Brand names

Personalization

Memory Game

- Teacher can easily personalize the product for student
- Users can transfer new words to the other user
- User can compare each others learning speed and scores

Usability Evaluation - Analysis

Aim	Goal	Objective
To teach users to read	Letters	Are they able to remember letters
	Words	Are they able to make words out of it
	Matras	Are they able to remember Matras
		Are they able to differentiate between similar looking letters.

Usability Evaluation - Analysis

No of Users : 2

Duration : 2 Days

Age : 23-25 years

Education : No formal education, one user knew few letters and words and other was completely illiterate

Usability Evaluation - Analysis

Day -1

•Collaborative Learning

•User was not interested earlier but then started taking initiative and making words

•At the end of the day he could almost remember all the letters taught to him

•And most of the words

But…

User remember E ºÉäË¨É±É not E

Usability Evaluation - Analysis

Day -2

- User came next day
- When asked about a letter, he said "chalo rakhke dekhte hai"
- Then he started revising everything by himself.

But…

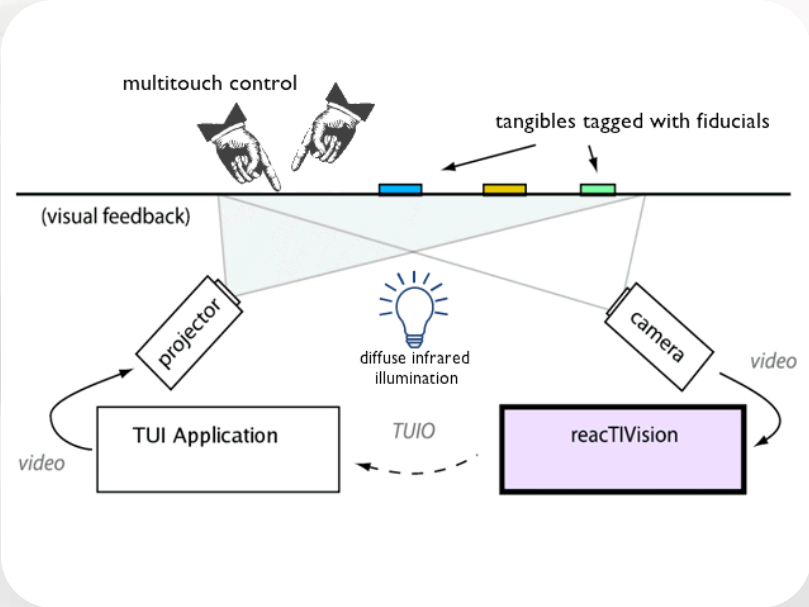
- He could remember just one letter
- He could not remember any word
- Similar looking letters needs more time

Usability Evaluation - Analysis

- Collaborative Learning
- Motivational
- No fear of making mistakes
- Self learning and revising
- Less involvement of teacher

Technology Used

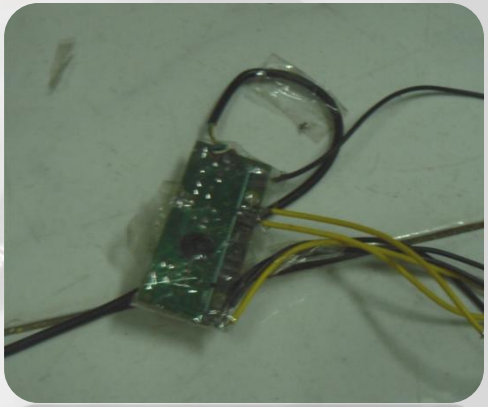
Tangible Letter



Technology Used

Memory Game

Similar Looking Letters



Future Technology

Acknowledgements

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Saurabh Gupta
Venkat Dharma

Wood Workshop
Plastic Workshop
Paint Workshop


Thank You!