

Standard Project Description

Title:

Talki

Learning Languages Through Play in Early Childhood

Author:

Caterine Apruzzese

Supervisors

Vanessa de Luca

Technical Advisor

Henrik Vendelbo

Made in collaboration with: Digital Sculptor GmbH Zurich

Year/ Edition

2019

Abstract

Talki is an interactive educational toy that teaches children aged 3-6 years old an additional language.

Young children learn and develop in a stimulating environment with room for curiosity, exploratory and imaginary play. They learn by watching, listening and especially by doing.

By combining technology and traditional educational exercises, Talki provides a multi sensory learning experience to reinforce learning by:

- Hearing
- seeing
- Doing
- Touching

Talki's methodology encourages open ended exploratory play, by giving the child as many chances as they need to find the right answer, without ticking clock, loud noises or rewards.

Talki reinforces phonological awareness, an auditory and pre-reading skill (before children can read and write). It allows the child to listen and recognise the sounds within words and break the words apart based on syllable counting.

It trains the child's ears to the sounds, rhythm, flow and pronunciation within words of a spoken Language. Talki uses educational exercises and principles such as rhymes, repetition of sounds in words e.g chhh for chocolate or shhhh for sheep, associating sounds to things and actions e.g woo woo for train 🚂, ding-dong for door 🚪, shhhhh for quiet 🤫 or tick-tock for clock ⌚, mooo moooo for cow etc and clapping the syllables exercise e.g 3 claps for e-le-phant to reinforce learning. Children can learn together with Talki everyday vocabulary such as food, animals, gardening and things in nature.

Interface and Interaction Modality

Talki is an interactive educational plush toy that helps children learn an additional language by training their ears to the sounds within words of spoken language.

Talki is a physical artefact. It has no off switch. It has a battery that keeps it functioning at all times. When it runs out of battery, it will say it is tired and needs to go to its home to sleep.

Talki will always be waiting to see the user. When it sees the user it will attempt to start a “conversation”. In other words, it will greet and will want to do an exercise where the child fetches for specific toys that are part of a set. The user doesn’t have to press any buttons to start an exercise. The main complexity involved is the intentional construction of the language and behaviour. All exercises follow the same principles based on human conversation and human interaction, where Talki asks for something in specific and awaits for the child’s response, and gives them feedback based on what they chose. The exercises played are traditional exercises for language learning taught at kindergarten and pre-school level.

Technology

Talki interfaces with a camera and a speaker and is controlled by a modern micro-controller. The PoC is implemented with a raspberry Pi but the real implementation would use a more specialised micro-controller build for machine learning. The PoC uses facial and barcode recognition due to the limited capabilities of the Raspberry Pi.

User Experience

Talki is straightforward and pleasant. It has a child-like voice so children can relate more to it, and treat it more like a “buddy” figure, just like a pet. Talki uses principles of real human interaction e.g when it is running low on battery it will say it is tired and asks the child to take it to its home. It teaches children concepts that go beyond language learning, such as concepts of empathy, care-taking and nurturing. It is a plush toy that speaks, and reacts to what the child does, making it a toy that is “alive”. Talki is a monster and has a mouth, so children can feed it and engage in imaginative/pretend play, which according to some Child Development Experts is crucial to their mental and social development.

Talki is also always happy to play. It reacts when it sees its owner by greeting them with a cheerful sentence. When playing, it will give feedback to the child, in an emotionally clear way, but never by praising or showing disappointment. Rather than speaking nonstop, Talki takes pauses, giving the child the chance to respond and focus. It uses repetition so that the child can master new skills and recognise sounds and words after a while.

Finally, the games played with Talki use multi sensory instruction, by engaging the child in auditory, visual and kinaesthetic play

Hear It!

See it!

Do It!

Touch It!

Research and Development context

Talki allows children learning a second language to get familiar, recognise and expose their ears to the sounds and flow of spoken words. It can also work as a tool to teach the right pronunciation of words in a foreign language, something parents often struggle with and often choose native speakers of a language to teach their children.

Phonological awareness skills are the building blocks for reading success. Furthermore, Talki trains listening and attention skills through play and encourages children to focus.

Children learn to talk by listening and this is a skill that develops over time. It requires a lot of practice for a child to learn how to tune into a sound, recognise and make sense of it and keep it in mind to work with it, all of which happens subconsciously by proficient speakers.