



# The Use of a New Visual Language as a Supporting Resource for People with Intellectual Disabilities



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# INTRODUCTION



Introduction

Framework

Experiment  
and Results

Discussion

Conclusions



INDUSTRIAL  
SOCIETY



INFORMATION  
SOCIETY



KNOWLEDGE  
SOCIETY



# INTRODUCTION



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Training in  
the use of  
ICTs



Digital  
Culture

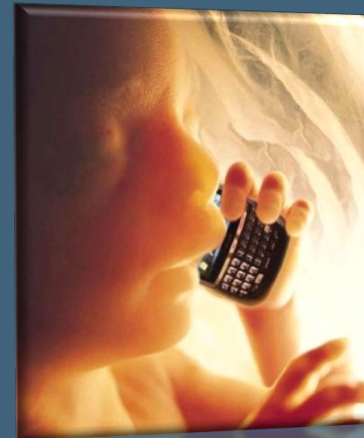


Internet  
access



Inclusion in a  
knowledge-  
based society

2nd DIGITAL  
DIVIDE



# INTRODUCTION



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Architectural and urban planning accessibility



Transport accessibility



Information and communication accessibility



e-accessibility

e-inclusion



# THEORETICAL FRAMEWORK

Accessibility  
Problems

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UNE-EN ISO  
9999:2007

- Classes.
- Subclasses.
- Divisions.

- Development and training of memory.
- Support and learning of literacy.
- Sensory stimulation enhancers.
- Development and training of language and communication.



# THEORETICAL FRAMEWORK

Accessibility Problems



New technologies have changed the way we work, act, communicate, interact.

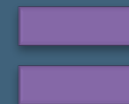


Electronic devices provide new possibilities

VISUAL  
LANGUAGE



NATURAL  
LANGUAGE



ACCESIBLE  
LANGUAGE

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# THEORETICAL FRAMEWORK

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# THEORETICAL FRAMEWORK

New Visual Language VILA

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KNOWLEGDE IN  
NATURAL LANGUAGE



TRANSLATOR



KNOWLEGDE IN  
FORMALIZED  
STRUCTURES

Goals

VISUAL

2D

Inserted  
Progressively



VILA\_1



VILA\_2



VILA\_3





# THEORETICAL FRAMEWORK

New Visual Language VILA



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## LINGUISTIC EXPRESIONS OF IDENTIFICATION

 juguete

muchos juguetes






## LINGUISTIC EXPRESIONS TO DESCRIBE CHARACTERISTICS

 niño  guapo

el niño es guapo



## LINGUISTIC EXPRESIONS TO DESCRIBE ACTIONS

 perro  X ladrar  (tarde; ayer)

el perro no ladró ayer por la tarde



# METHODOLOGICAL FRAMEWORK



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VILA-1



juguete

VILA  
ACCESIBLE

*mucho*



*juguetes*



# EXPERIMENT AND RESULTS

Prototype

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The screenshot displays a language learning application interface. At the top, a title bar shows the number '6' and the sentence 'el abuelo comer carne y ensalada'. Below this, a horizontal bar contains six tiles: 'el' (with a downward arrow icon), 'abuelo' (with a grandfather icon), 'comer' (with a person eating icon), 'carne' (with a meat plate icon), 'y' (with two checkmarks icon), and 'ensalada' (with a salad bowl icon). A blue circle with the number '5' is positioned to the right of these tiles. Below the horizontal bar are three control buttons: 'IZQUIERDA' (left arrow), 'BORRAR' (trash can), and 'DERECHA' (right arrow). A blue circle with the number '4' is placed over the 'BORRAR' button. To the right of these buttons is a 'LEER' button with a magnifying glass icon. Below the control buttons is a large grid of 24 tiles, each with a word and an icon. The words are: abrigo, azúcar, bizcocho, bolso, caballo, café, calcetines, carne, casa, cepillo, cepillo de dientes, cerveza, chocolate, ciudad, conejo, cuchara, cuchillo, ducha, ensalada, espaguetis, frigorifico, fruta, galletas, and gato. A blue circle with the number '2' is placed over the 'casa' tile. At the bottom of the grid are two green arrow buttons pointing left and right, with a blue circle containing the number '3' between them. On the left side of the interface is a vertical menu with seven categories: 'Nombres' (orange), 'Personas' (yellow), 'Determinantes' (white), 'Descriptores' (purple), 'Verbos' (green), 'Nexos' (light blue), and 'Expresiones Sociales' (pink). A blue circle with the number '1' is placed over the 'Nombres' category. In the top right corner, there are two small icons: a pencil and a red 'X'.



# EXPERIMENT AND RESULTS

## Evaluation of Software Prototype



AMIDOWN  
Asociación  
Amigos  
Síndrome  
De Down



Instituto Nacional  
de Tecnologías  
de la Comunicación

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### EVALUACIÓN DEL FUNCIONAMIENTO DEL PROTOTIPO VILA Accesible (v. 1.0)

Valore las siguientes afirmaciones:

Pregunta	Completamente en desacuerdo -2	-1	0	1	Completamente de acuerdo 2
No tuve mayores dificultades a la hora de trabajar con el interfaz principal de la aplicación.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
No tuve mayores dificultades a la hora de realizar las operaciones básicas para abrir, guardar, imprimir y salir de la aplicación.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
El moverme por las distintas categorías de pictogramas y la elección de cada uno de ellos me resultó fácil	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
No tuve mayores problemas a la hora de crear y modificar las frases con la aplicación.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
En ocasiones no entiendo lo que tengo que hacer.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
En general, la aplicación me resultó fácil de utilizar.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
La aplicación funciona correctamente.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



# EXPERIMENT AND RESULTS

Advantages of  
Using VILA

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## COMPLEXITY

Simplification  
of syntactic  
structures.

## AMBIGUITY

Identification  
of each term in  
a unique way.

## UNIVERSALITY

Independence  
of the  
language used.



# DISCUSSION



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**VILA**  
**Accessible**

- Using pictographic communication systems favors the visual memory process and relating words to concepts.
- Special motivation has been observed in children in general when using pictograms.
- The meaning of some pictograms is complicated for those who suffer from Down syndrome and this involves a specific sentence syntax learning process.
- The use of the verbs confuse children as there are no verb tenses since the pictograms do not vary for each grammatical change.
- The same occurs with the lack of distinction between gender and plurals in the definition of the concepts.





# CONCLUSIONS



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- The role of new ICT in today's knowledge society is crucial, although its use also generates, in some cases, risks of exclusion for some groups.
- This paper proposes the use of a new visual language known as VILA to resolve the accessibility problems people with certain types of disabilities have when using ICTs to access the information and knowledge society and communicate with other people under equal terms.

