

ECOSYSTEM OF INTELLIGENT TOOLS TO PROVIDE SUPPORT IN DIAGNOSIS AND INTERVENTION IN LEARNING TO WRITE FOR CHILDREN WITH SPECIAL EDUCATIONAL NEEDS.

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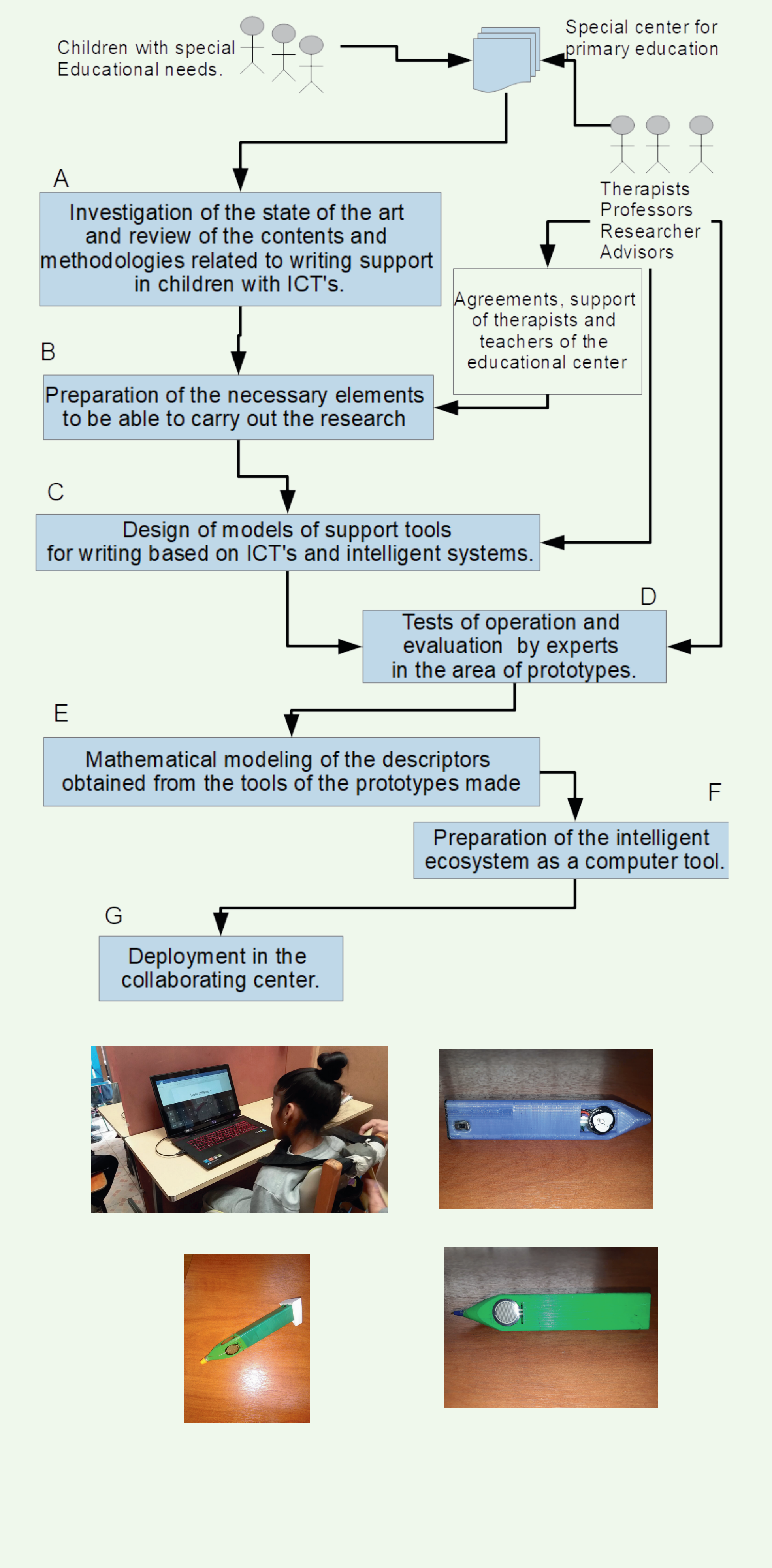
MOTIVATION

- According to the World Health Organization (WHO), there are more than one thousand million people who have some kind of disability. This number of people represents approximately the 15% of the worldwide population.
- According to the Ecuadorian National Council for Disabilities Equality (CONADIS), in Ecuador 427,826 people live with some form of disability. This last represents the 2,56% of the total Ecuadorian population (March, 2018).
- School learning systems are standard for all children, it is necessary to present new options for intervention in learning in the writing of children with special educational needs.
- We propose an ecosystem of intelligent tools in order to develop necessary skills for specific learning without creating a technologically-dependent in children.

THESIS OBJECTIVES

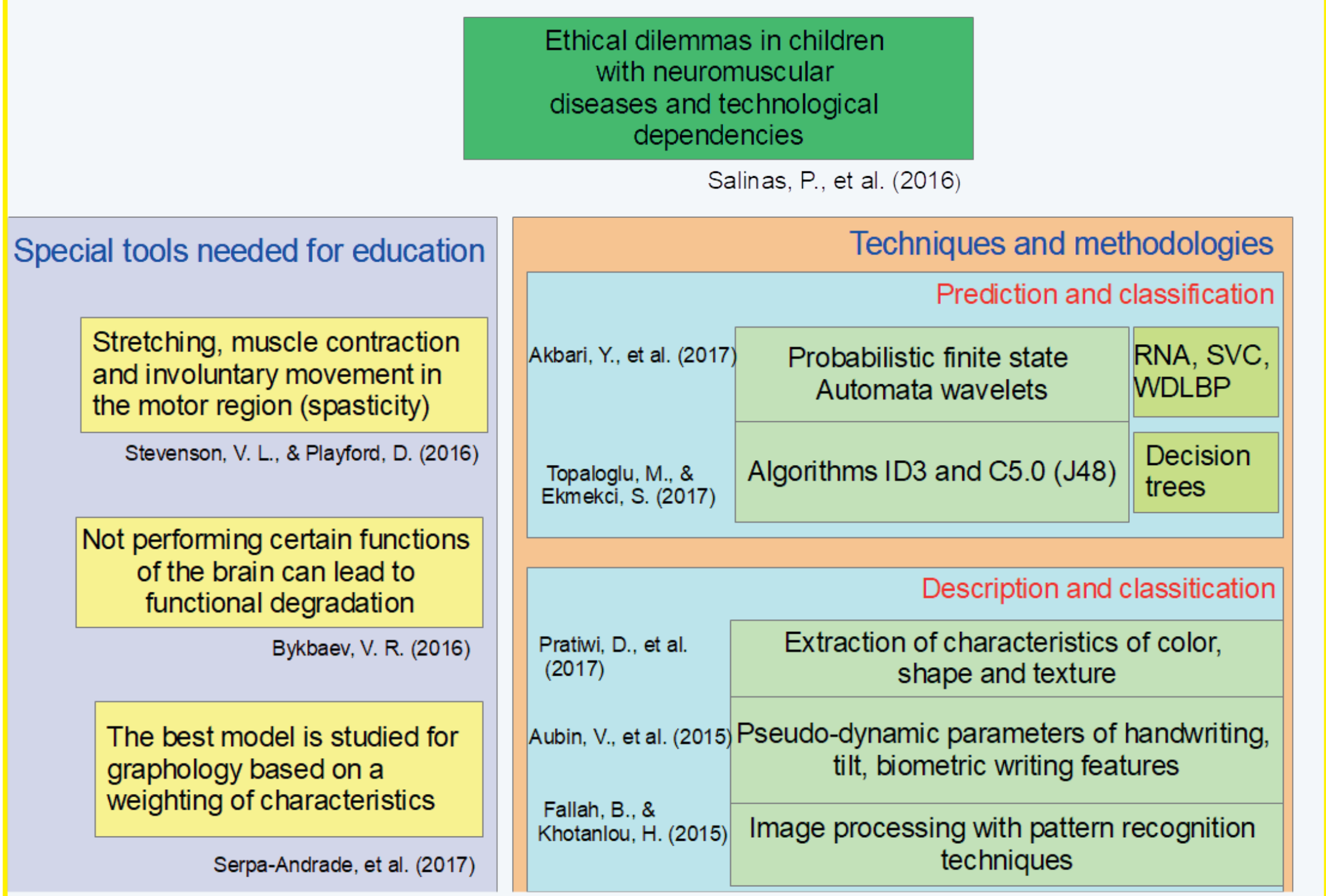
- The main purpose of the doctoral research is to create an ecosystem of tools for the diagnostic support and intervention of learning in the writing of children with special educational needs, for which it is necessary:
- To carry out the study and analysis of the main educational needs, presented by children with writing difficulties.
 - To propose methods that support the learning and writing training of children with special educational needs.
 - To propose, based on prediction tools, a mathematical model that relates the variables obtained.
 - To implement the tools within the learning ecosystem for the writing of children with special educational needs.

RESEARCH PLAN



RELATED WORK

- We have performed an analysis of related work with the aim of determining which methods are used to support the writing learning in children with special educational needs.
- In this line, we will determine which descriptors are needed to develop a mathematical model to support the writing prediction.



NEXT YEAR PLANNING

- Given the results achieved with the initial research, we propose the following activities and future research:
- To propose intelligent systems for writing support based on the analysis of the methodologies used in the school and reviewed in the state of the art.
 - To explore the feasibility of generating a digital signature by implementing mathematical models taken from the optimal pencil-type prototype.
 - To analyze the possibility of making an intelligent system for the prediction of writing based on the digital signature.
 - To raise a system to improve learning, using an alternative tool using eye movement.
 - To model a new alternative system for support in the learning of writing through body movement.

PRELIMINARY RESULTS

- Some tools have been developed for the proposed ecosystem:
- 3 prototypes of pencils to obtain graphological characteristics and improve grip.
 - A writing system with the use of "Tobii eye tracker 4c", as access for learning on the computer through eye tracking.
- The collaboration agreement with a public school of Azuay has been made. A research project based on the proposal of the doctoral subject has been generated. We delivered 30 pencils cases to the education center to be used in the classrooms of third and fourth year of basic education. Data has been collected on the use of pencils in language therapies and some subjects associated with the school level.

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