

# The ruler of inclusion in the process of people learning with visual disability

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**Abstract.** The aim of this project is the development of a pedagogical tool that could address the needs related to the learning process of the blind and could also be used in the pedagogical process of people who are visually impaired. This project also has the objective of showing how the forms of the Ruler of Inclusion were planned in order to facilitate learning while addressing issues related to its safety, practicality and multifunctionality, aspects that are broached in a future work using descriptive, exploratory and phenomenological analyses to verify the understanding of the learning concepts applied to the ruler.

Keywords: Ruler of inclusion, learning process, safety, practicality, multifunctionality.

## 1. Introduction

This The creation of the Ruler of Inclusion for the visually impaired arose from a teaching, research and extension project conducted by researchers and students of the Mechanical Production Engineering, Technology in Product Design, Plastics Engineering and Masters in Production Engineering courses of the Instituto Superior Tupy/SOCIESC. The aim of the project was the development of a pedagogical tool that could address the needs related to the learning process of the blind and could also be used in the pedagogical process of people who are visually impaired and those who have regular vision. This project also has the objective of showing how the forms of the Ruler of Inclusion were planned in order to facilitate learning while addressing issues related to its safety, practicality and multifunctionality, aspects that are broached in a future work using descriptive, exploratory and phenomenological analyses to verify the understanding of the learning concepts applied to the ruler.

## 2. Method

Place To reach the objectives proposed in this article, descriptive, exploratory, and phenomenological analyses research was conducted. The research is exploratory: according to Gil [1], it aims at creating greater familiarity with the problem, with the objective of allowing its formalization and the formulation of hypotheses. According to the author, this kind of research does not use sampling methods and quantitative procedures frequently, which permits the obtention of a broader vision of the phenomenon studied.

The research is also descriptive, for it aims at describing specific aspects of this phenomenon and uses standard techniques of data collection such as questionnaires and systematic observation [1].

Moraes [2] understands that phenomenology is an adequate instrument to verify the trials experienced by blind individuals, which is the case here, believing that through this method the world may be understood by means of a reflexive relationship between learning and action. The experience lived is thus not gained immediately, but in a subsequent process where the individual reflects on his action and is able to describe his learning process.

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The research was also based on the bibliographic research method described by Lima and Miotto [3]. According to the authors, bibliographic research differs from literature review. Whereas literature review “is just a pre-requisite for the execution of any research,” bibliographic research is characterized by an “ordered set of procedures” that permit answering a research question [3].

To reach this study’s proposed objectives, the following steps are followed: first, the theoretical perspectives about learning are approached as per Merriam and Caffarella [4]. The following step is the elaboration of the concepts related to the Ruler of Inclusion and its safety, practicality, and multifunctionality requirements, followed by relating the learning processes to these requirements. The final step is the presentation of the final considerations.

### 3. Results

The results of the research arise from an investigation conducted with 100 visually impaired interviewees. From these results, a study will be conducted with the objective of showing how the forms of the Ruler of Inclusion were planned to facilitate the learning process while catering for the safety, practicality and multifunctionality requirements. These aspects are broached in a future work to verify the understanding of the learning concepts related to the requirements from ruler, by means of a descriptive, exploratory and phenomenological analysis.

### 4. Discussion

The analogy technique was related to the project of the ruler - an associative means of creating formal proposals based on existing objects, either related to the product in question or not. From the products evaluated, such as the standard ruler, the writing guide for people with subnormal vision, the signature guide and protractors, came the inspiration for the creation of a solution in the form of a ruler that has functions aimed at the learning process for the visually impaired.

As a consequence of all the above-mentioned activities, a list of possible items to be implemented in the product, to cater for the learning needs for the visually impaired, was prepared. Solutions for the generation of alternatives directed at the learning of the visually impaired will be presented through the questions discussed in the article.

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