Chapter 6

Physical Access Difficulties at Educational Institutions Experienced by People With Visual Impairment

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ABSTRACT

The objective of this chapter was to assess the impact that haptic tools have on the experience of people with some kind of visual impairment when accessing a building. The analysis was performed through the application of a case study carried out in the facilities of the Center for Teleinformatics and Industrial Production of the National Learning Service in Popayán, Colombia with the participation of five people. Taking into account the principles of universal design, the analysis considered people with total blindness, partial blindness, and people without visual limitation. Participants provided feedback and insights on their experience locating the designated area with and without the support of defined haptic tools. The study resulted in a set of drawbacks that influence the location of visually impaired people. Such findings can be taken into account by people who wish to make projects of access to physical spaces of visually impaired people.

INTRODUCTION

The National Apprenticeship Service (SENA, for its Spanish acronym) is a national public institution that offers free job training to millions of Colombians without distinction as to race, creed, economic status, age or political affiliation.

DOI: 10.4018/978-1-7998-2325-4.ch006
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As a work training entity, SENA has a constitutional duty to serve vulnerable populations including people with disabilities but, in a city like Popayán, whose well-preserved colonial architecture has given it the title of “white city”, much remains to be done in terms of accessibility and particularly inside the buildings considered as architectural heritage, which were built hundreds of years ago without taking into account accessibility considerations.

BACKGROUND

While it is true that design considerations are important to provide an adequate experience to the users of any product, the creation of haptic tools requires greater attention to design specifications to ensure that users’ interaction with the tool is appropriate.

Considering the above, there are a number of concepts that are important to keep in mind during the design process that were implemented in this work and are described below.

The term “haptic” has its origin in the Greek word ἁπτικός (haptikós), which means “related to the ability to touch” (Capítulo II - Tecnología Háptica, n.d.); in human terms, perception refers to the process in which stimuli received by the senses become an organized experience, that is, it is the way the brain organizes and gives meaning to the information it receives from the different sensory organs (Dezcallar Sáez, 2012).

Bearing this in mind, we can infer that haptic perception refers to that which uses touch as a source of information and comprises tactile, cutaneous or static perception in which we feel the consistency and temperature of what we touch, and kinesthetic or dynamic perception in which movement provides information such as form, texture and hardness (“Educación Inclusiva - Módulo 9: Adaptación del material - Percepción táctil y háptica”, n.d.).

The title of the first person to use tactile characters for reading is attributed to Al-Imam Al-Amadi in the mid-13th century. Al-Amadi was a book salesman who, being blind, used a series of embossed characters to recognize the price and title of each book (García Rubio, 2006).

Louis Braille’s attendance at the Royal Institute for Young Blind People, a school founded by Valentin Haüy who developed the method of printing in relief on paper (Alvarez Gámez et al., 2000), and Charles Barbier’s sonograph, which consisted of a matrix of 6 lines and 2 columns to represent the letters of the alphabet and some frequent sounds, inspired him to create what is now known as Braille language.

Braille language

Braille is a system that allows blind people to read and write by touch using raised dots distributed in a space known as a braille box or cell whose size is the same for all users of that system (“El código Braille”, n.d.). The presence and location of the dots inside the box can represent up to 64 different combinations including the empty cell, which represents a space or separation between words.

Because of this, and bearing in mind that more than 64 different combinations are needed to express, in addition to letters, characters such as numbers, mathematical operations, punctuation marks and even musical symbols, double or complementary symbols are used which, introduced before a certain combination of points, transforms it into a number, a capital letter, italics or even a musical note (“Educación Inclusiva - Módulo 9: Adaptación del material - Percepción táctil y háptica”, n.d.); In addition, the