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EXPERIENCES IN TECHNOLOGIES FOR INCLUSION

Florencia Artecona[1,2] and Victoria Argibay[1,2]

RESUMEN

El Centro de Referencia de Tecnología para la Inclusión (CeRTI) tiene como objetivo superar las barreras para el aprendizaje y la participación a través de la tecnología, apoyando a los educadores en la mejora de los procesos de enseñanza y aprendizaje dentro de los espacios educativos. CeRTI ofrece evaluación, asesoramiento, entrega de rampas digitales y capacitación a estudiantes, docentes y familias sobre el uso de tecnologías accesibles. Una de sus iniciativas clave es el concepto de "Rampas Digitales", que son software y/o hardware que permiten el acceso a contenido y equipos tecnológicos para personas con barreras cognitivas, sensoriales y/o motoras. CeRTI también proporciona kits de viaje para llevar herramientas tecnológicas a instituciones educativas, facilitando el acceso a dispositivos y apoyo para estudiantes con barreras. A través de estas iniciativas, CeRTI contribuye a la educación inclusiva y promueve el uso de la tecnología para mejorar las experiencias de aprendizaje de todos los estudiantes. Este trabajo está en curso y esperamos realizar más análisis sobre el impacto de la tecnología.

ABSTRACT

The Reference Center for Technology for Inclusion (CeRTI) aims to overcome barriers to learning and participation through technology, supporting educators in enhancing teaching and learning processes within educational spaces. CeRTI offers evaluation, advice, delivery of digital ramps, and training to students, teachers, and families on the use of accessible technologies. One of its key initiatives is the concept of "Digital Ramps", which are software and/or hardware that enable access to content and technological equipment for individuals with cognitive, sensory, and/or motor barriers. CeRTI also provides traveling kits to bring technological tools to educational institutions, facilitating access to devices and support for students facing barriers. Through these initiatives, CeRTI contributes to inclusive education and promotes the use of technology to enhance learning experiences for all students. This work is ongoing, and we anticipate conducting further analysis to evaluate the broader impact of this technology.

Key Words: inclusive education — accessible technology — learning experiences

1. WHAT IS CERTI?

CeRTI Ceibal is the Reference Center for Technology for Inclusion[3], aiming to overcome or reduce barriers to learning and participation through technology. CeRTI seeks to support educators in finding strategies and technological resources that enhance teaching and learning processes within educational spaces, across all subsystems and modalities. It synergizes the fields of education, disability, and technology. CeRTI Ceibal collaborates with teachers and students with disabilities, as well as those facing barriers that hinder or complicate their full participation in education.

CeRTI is composed of an interdisciplinary team of technicians and professionals from Creática and Ceibal, with backgrounds in education, technology, social work, speech therapy, psychoeducation, and psychology. They have extensive experience and continuously update their knowledge in the fields of education, inclusion, disability, and technology.

2. WHAT DOES CERTI CEIBAL OFFER?

Certi Ceibal offers various services for students with disabilities, including:

- Evaluation: Certi Ceibal evaluates the specific needs of each student in relation to the use of ICTs.
- Advice: Certi Ceibal provides advice to students, teachers, and families on the use of accessible technologies.
- Delivery of digital ramps: Certi Ceibal delivers digital ramps, which are technological resources that allow people with disabilities to access ICTs. More info is provided in the following section.

[1]Creatica. Certi-Ceibal, Montevideo, Uruguay (Authors' email: accesibilidad@ceibal.edu.uy)
[2]Creatica. Montevideo, Uruguay.
[3]`https://ceibal.edu.uy`

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Fig. 1. Equipment with adaptations to make it as autonomously and effectively as possible. Details in the text.

- Training: Certi Ceibal offers training to teachers and families on the use of accessible technologies.

  All students in public schools in Uruguay who have any type of disability can access Certi Ceibal.

3. WHAT ARE DIGITAL RAMPS?

One of the main barriers a person may encounter when using a computer, tablet, or cellphone is the barrier to access. For example, someone with limited hand movement may find it challenging to use a conventional keyboard and mouse. To overcome such barriers, Rafael Sanchez Montoya coined the term "Digital Ramps". This conceptual construct is an analogy to architectural ramps placed in buildings with stairs for access. Just as ramps enable people, such as wheelchair users, to access specific places, modes of transportation, etc., digital ramps or assistive technologies are defined as software and/or hardware that make accessing certain content and/or technological equipment possible when cognitive, sensory, and/or motor barriers are present. The purpose of these programs is to facilitate the use of general computer tools for people with disabilities who would otherwise be forced to use programs specifically designed for them.

3.1. *Digital Ramps: Software*

Before installing any downloadable ramps, it's essential to know that currently, all operating systems have an accessibility center where necessary configurations can be made to allow students to use their equipment as autonomously and effectively as possible. These adaptations are classified into four main areas: hearing, vision, writing (keyboard), pointing and clicking (mouse). This information is crucial as it requires no external download and/or installation, and all devices have these or some of these accessibility functions.

Regarding Software-type ramps, there is a wide variety of downloadable and installable programs for computers, tablets, and cellphones designed to, for example, increase the mouse pointer's size or make it more visible, control mouse movement and functions through the device's webcam, perform clicks by blowing, screen readers to make all screen information audible, use the on-screen keyboard, among many others.

3.2. *Digital Ramps: Hardware*

Hardware-type ramps are tangible elements connected to the computer or tablet to make their use more accessible. These include mice, keyboards, headphones, and eye-tracking devices. On the other hand, there are also elements that, while not directly allowing access to the computer, facilitate its use by improving posture or position; these are support elements.

Different types of mice can be used in situations where motor or hand-eye coordination issues hinder the use of a conventional mouse. In situations where understanding conventional mouse usage is difficult due to affected comprehension, it is essential for the person in such situations to try different types of mice to evaluate their use, access, and comfort. Keyboards help overcome motor and visual barriers. Additionally, they can be crucial when conventional writing is affected by motor or cognitive issues. They can be very useful for stimulating writing when a cognitive function is affected.

The eye-tracking system allows laptop control based on gaze without the need for arm or hand

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Fig. 2. Photo of the traveling kit.

movement. Image: button mouse, high-contrast keyboard, and trackball mouse.

4. WHAT IS THE TRAVELING KIT?

The Traveling Kit aims to bring technological tools to Uruguayan public educational institutions, facilitating access to Ceibal devices and timely support for students facing motor, visual, and/or cognitive barriers. It is crucial to understand that, in the presence of such barriers, various interaction possibilities facilitate access and use. For example, offering tactile interaction, moving the mouse pointer using eye movement or through the webcam with head movements, performing various actions by voice commands, using different types of mice and/or keyboards, etc. The main objective of traveling kits is for teachers to be familiar with and offer a wide range of resources (whether software or hardware) to determine which best suits the specific needs of a particular student.

A form to request more information and guidance is available[4].

5. CONCLUSION

The experiences shared in this work shed light on the pivotal role of technology in fostering inclusive education. Through CeRTI Ceibal, Uruguay has made significant strides in leveraging technology to overcome barriers to learning and participation for students with disabilities. The provision of digital ramps, training for teachers and families, and the implementation of accessible technologies highlight the commitment to ensuring equal opportunities in education. Moving forward, continued efforts in research and analysis will further enhance our understanding of the impact of technology on inclusion and inform future initiatives in this important field.

[4] https://machform.ceibal.edu.uy/formularios/view.php?id=1561443