The use of Information and Communication Technologies in Augmentative and Alternative Communication - Literature review in Portugal

Patrícia Alexandra Pinheiro
University of Minho, CIEd

Maria João Gomes
University of Minho, CIEd
mjgomes@ie.uminho.pt

Anabela Cruz dos Santos
University of Minho, CIEd
acs@ie.uminho.pt

Abstract

The applicability of the information and communication technologies, especially mobile devices, to augmentative and alternative communication is relatively recent in Portugal. Their characteristics of universality and portability allow to access information, communicate through voice, image and writing, working, perform recreational activities and multiple others activities almost anywhere and any place. It also promotes skills development in people with special educational needs, like physical, cognitive and social skills, when using the appropriate adaptations and digital augmentative and alternative communication software or other applications adapted to their physical or sensory disabilities. The aim of this work is to reveal the state of the art about the use of information and communication technologies in the context of special educational and more specifically in augmentative and alternative communication in Portugal, supported on the literature review. We selected the Portal B-on - Online Knowledge Library, since it allows us to have a perspective of several databases repositories of scientific research. This literature review aims to analyze, summarize and interpret some studies carried out in Portugal that focus on the binomial: Information and Communication Technologies and children with Special Educational Needs.

Keywords: Information and Communication Technologies, Special Educational Needs, Augmentative and Alternative Communication Systems.

Introduction

Communicative competence is the ability to functionally use communication in natural environment by addressing the needs that arise during daily interactions that take place in this environment. It is the ability to express feelings, ideas and needs in an understandable way. As regards Trenholm (1999, p.22), communication "is a process through which people attach meanings to stimuli in order to make sense of the world." Communication is essential for the healthy and harmonious development of human beings. Learning is an interactive process between adults and children done by explaining the meaning of objects, gestures, movement, expressions and speech.
To Tetzchner and Martinsen (2002) speech is the most natural form of human communication and adopted by people with active vocal apparatus and normal hearing.

However, a significant number of people are unable to communicate through speech, requiring an additional communication mode. The Augmentative and Alternative Communication (AAC) refers to all forms of communication that can complement, supplement and/or replace speech. It is intended to cover the needs of receipt, understanding and expression of language and increase communicative interaction of individuals without verbal communication. The main objective is to ensure an alternative form of communication with the subjects around us and increase the quality of life of individuals.

The Alternative communication is "any form of communication other than speech and used by an individual in the context of face to face communication. Sign language, Morse code, and writing are examples of alternative forms of communication to individuals who lack the ability to speak. "Augmentative Communication" means additional or supporting communication. The word augmentative underlines the fact that the teaching of alternative forms of communication has a dual goal: promoting and supporting speech and ensure an alternative form of communication if one does not learn to speak" (Tetzchner & Martinsen, 2002, p.22).

Communication is often a major difficulty for children with Special Educational Needs (SEN). The technologies have the potential to be a facilitator of learning and autonomy with strong motivating power, they may play a dual role: the playful and didactic. From the point of view of Rodrigues (1998), quoted in Moura (2006), there is an important feature that distinguishes the use of Informative Communication Technologies (ICT) in Special Education and Regular Education: the character of indispensability that they assume in Special Education for children with communication problems. For many children with SEN, technological resources are not only an advantage in access to learning, but supports them, in being more functional, have more control of the environment and can even help them in socio-affective domain, making easier for them do communicate with others.

Branson and Demchak (2009) stated that Augmentative and Alternative Communication Systems (AACS) are used to compensate or overcome temporary or permanent communicative limitations and its use can have three distinct user groups: a) group of people whose verbal language is impaired, but effectively understand what is said to them, b) group of people who only require augmentative and alternative communication at certain stages of life in order to overcome a temporary limitation, and c) group of people who need constant and definitely of AAC Systems. The main objective of any system of communication aid is to "compensate (temporarily or permanently) the communication patterns of individuals with severe expressive communication disorders with disabilities" (American Speech-Language-Hearing Association, 1989, cited in Mirenda, 2003, p.204). Early use of AAC Systems, even in children under three years of age, in the immediate moment that communication difficulties are recognized is recommended (Broberg, Ferum & Thunberg, 2012; Branson & Demchek, 2009).

Mirenda (2003) refers to two types of AAC Systems: with aid and without aid. The AAC Systems unaided require no external equipment to the body and involve the use of symbols such as hand signs and gestures. The AAC Systems with aid incorporate external use of symbols such as photographs, letters and words devices.

The ICT, particularly mobile devices, associated with AAC has potential that can be explored in various fields of life of children with SEN. Its portability, the multimedia features, binding capacity to digital communication networks, among other things, increase opportunities for social interaction and commitment in teaching and collaborative learning.

Method

This research study aims to answer the following questions: What kind of research can be find in Portugal relating ICT and SEN? What studies about the relation between ICT and AAC exist in our databases?

For this research we selected the Portal B-on - Online Knowledge Library, since it enables us to have a perspective of several databases repositories.

To use the search engine of B-on the following keywords or expressions: Informative Communication Technologies (ICT), Special Educational Needs (SEN) and Augmentative and Alternative Communication (AAC) were inserted. We used all keywords/expressions in English and Portuguese to try to reach as many combinations as possible.

Recent research studies were our target, specifically in the last five years or so, since our goal was to analyze, summarize and interpret some studies carried out in Portugal using ICT with children with SEN.

Results

Results of the studies found showed that there are in Portugal several perspectives of authors and researchers about the use of ICT in SEN and AAC. In order to understand these different perspectives and usability general results of the studies will be presented.

To Santos (2006), the computer can provide individualized teaching and be a learning facilitator especially to students with SEN, assuming as a major resource for the recovery of these students or be used as a complement to education.

Rodrigues and Teixeira (2006), emphasize that ICTs enable's support, contents and forms that boosts the processes of inclusion and sociability. The technical aids in helping dimensions, adaptive and / or educational are essential to explore the potential of technology in everyday life of these children, fostering new perspectives on the involvement of children with SEN, facilitating access to knowledge, learning in the free time, culture and contact with friends or interest groups. Technologies act at the level of the child, reducing their disadvantages and improving their functional capacity and at the level of environment, reducing the demands of the teaching and learning process.

Monteiro and Gomes (2009, p.5970), citing Freire (2004), report that digital inclusion is inevitably linked to accessibility. Although the technologies are not the complete solution, access to ICT enables better integration in society as they are associated with opportunity, citizenship and knowledge. So, they are considered key digital inclusion actions in public policies for social inclusion.

Gandâra (2013) showed the designs and practices of teachers in relation to the adoption of ICT in pedagogical practices with SEN students, evaluated the impact of ICT use on the learning of a child with SEN comprehended the real use of ICT in schools and finally learned about the tools used in the development of competencies of these children.

Correia (2012) showed an advantage of digital interactivity of the method of the 28 words in the process acquisition of reading competence in children with Trisomy 21. Concluded that Jclic software, thanks to its ease of use and variety of activities that you can develop, can be very useful in organizing strategies in the initiation process of learning to read in children with SEN.

Vaz (2012) carried out an investigation with a young with Rett syndrome. The author used a structured intervention in a dynamic planning, action, evaluation and reflection, generating differentiated educational practices and driving the use of ICT - Magickeyboard software - in favor of young's communicative success. The results indicate communicative progresses along the work sessions and expansion its

communicative level, facilitating interaction with colleagues, teachers and caregivers, helping to improve their quality of life.

Quelhas (2011) notes the high level of motivation and interest shown by the use of ICT by young people with Trissomy 21 as well as their capacity in use of general use equipment not specifically adapted. Silva (2011) focused on the importance of mathematics communication with a visually deficient student using Excel. The work allowed the development of communication and autonomy of visually deficient student. Oliveira (2010) conducted a study of exploration of ICT in the educational process of a student with Ataxia, total disability in oral communication and severe limitations in fine motor skills. The voice synthesizer software was used in the laptop and revealed new possibilities for student communication, which in the author's opinion could be expanded using communicator Go Talk 20 +25.

Afonso (2010) using the educational software Mimocas studied the impact in motivation for learning a child with Trisomy 21 and concluded that the software caused more motivation for learning and overcame some physical and cognitive limitations.

Henriques (2010) conducted a study whose objective was to evaluate the impact of using a computer application – Escola Virtual - in a child's learning with SEN in mathematics. The findings revealed a positive impact of ICT on learning of the child, benefits of the interaction between the interface and the student, ease of access to information necessary for the execution of tasks, increased motivation and aid in understanding the content and relative to each other.

Moura (2006) investigated the question of the introduction and use of ICT in supporting of formal education of students with Cerebral Palsy. As a result of empirical research, noted the importance of ICT in developing autonomy, learning and communication of these students. However, it was found that the complexity of the Cerebral Palsy determines the failure or success of the introduction and use of ICT technologies in educational contexts.

In the last years research done in this field have shown the importance and relevance of ICT in the life of people with SEN.

Discussion and final considerations

In Portugal, research on ICT and SEN with focus on AAC is a recent field of studies which is growing up since 2010 according to most published papers.

Furthermore, this literature review illustrates several benefits of using ICT in schools and in daily living in relation to children with SEN, and points out for the need of promoting teacher training in this field and improving this research area. ICT are today an essential resource in supporting students with SEN and that any type of device that allows the student, write, communicate, explore the environment and make decisions will allow greater participation in school activities, in classroom dynamics and enhance the possibility of greater success in the learning process in orderto promote the inclusion of children in the society, and furthermore reduce differences and inequalities in education (Batanero, 2004; Pérez & Montesinos, 2007).

In addition, most research have focused on ICT in SEN and general effects in learning and motivation, however it seems to be a gap in research performed in Portugal relating ICT and AAC systems. To conclude, more research studies associating ICT and AAC in order to establish a more effective intervention are needed.

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