Contribution of ICT to Improve Learning of People with Special Educational Needs: A Comparative Perspective between Public School and Private School †

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Abstract: Assuming the positive impact of Information and Communication Technologies on learning of students with Intellectual and Developmental Difficulties and considering the articulation of the public system and the particular and cooperative system of schooling of these students in Portugal we will seek to guide a research in a comparative perspective according to an empirical approach, framed in the Comparative paradigm.

Keywords: Comparative Methodology; Intellectual and Developmental Difficulties (IDD); Information (ICT); Special Educational Needs (SEN); Personal Learning Environments (PLE); Adapted Personal Learning Environments (APLE)

1. Introduction

For students with special educational needs (SEN), Information and Communication Technologies (ICT) represent a decisive normalizing element in general and may offer the only possibility of accessing the curriculum that would otherwise be problematic. The emergence of Web 2.0 created expectations and possibilities for flexibility and personalization of learning, transforming Virtual Learning Environments (VLE) into Personal Learning Environments (PLE) responding to the challenge of providing accessible, personalized and flexible learner-centered learning to students with intellectual and developmental disabilities (IDD). Considering the articulation of the public system of schooling of students with SEN and that of the private and cooperative system, we will guide this research in a comparative perspective between the two systems as an empirical investigation, framed in the Comparative paradigm, using the method of the survey and the techniques of interview, questionnaire and non-participant observation. This methodological option, which Stake [1] refers to as triangulation of research data aims to obtain a better scientific knowledge of the reality to be studied.

2. Theoretical Framework

2.1. Inclusion and Education of the Disabled

The extension of the principle of Inclusion, from the general social domain to the one of Education, allowed to develop an educational model of change which has resulted in the

reorganization of School from a culture-based model to a process-based model in which the student occupies the central role. Inclusive Education supposes an Inclusive School [2,3] in which the difference, due to cultural or racial differentiation, is the object of greater attention and acceptance.

2.2. Inclusive Education in Portugal

School integration in Portugal was influenced by the Public Law of 1975 and the Warnock Report of 1978 among others [4]. From 1975 onwards, political measures such as Lei de *Bases do Sistema Educativo, n.º 46/86* of October 14 stating equal opportunities and rights of all children to education, regardless of their characteristics enabled the establishment of objectives and organization principles for Special Education in the Portuguese educational system. From then on policies were clearly based on the *Escola para Todos* (School for All) an inclusive perspective that values collaboration between regular and special education and seeks to serve all children with support from teachers according to principles of pedagogical differentiation, adequacy of strategies and learning rhythms and work organization for students. Currently, *Decreto-Lei 3/2008*, dated from January 7, defines the specialized support to be provided from pre-school education through basic and secondary education in the public, private and cooperative sectors.

2.3. ICT and Special Education

The relationship between Education and ICT has been the subject of research, with the purpose of describing and understanding the effects of the first on the second based on the perspective that ICT has the potential to modify the way children learn and develop their cognitive abilities based on new learned skills and improved old ones [5]. Assuming that ICTs have a positive impact on SEN pupils, it is apparent that most of the ICT resources available to these users are intended to alleviate their difficulties and are generally intended for individuals with sensory and motor disabilities or are associated with adapting applications (and corresponding interfaces) to individuals with common characteristics—such as braille keyboards for the visually impaired—seeking to adjust to their characteristics, needs, and interests by revealing potential as back-up technology.

2.3.1. Personal Learning Environments (PLEs)

Considering the positive effects of teaching with technology on learning, we highlight the set of tools called Web 2.0 or social software [6] and the development of environments in which, through flexibilization and personalization, the product of the interaction occurs and is applied. PLEs are particularly adjusted to students with disabilities when considering autonomy and self-regulation gain and accessibility through flexibility and availability of content adapted to the student's needs [7].

2.3.2. Adapted Personal Learning Environment (APLE)

For an PLE to be adapted, according to Maguire, Elton, Osman and Nicolle [8] it is necessary to ensure accessibility, usability, individualization, multimedia interfaces, assistive technologies and curriculum compliance. Although accessibility, as noted by these authors [8], is important in a system accessed by individuals with different characteristics, it can be difficult to achieve. According to Dix, Finlay, Abowd, and Beale [8], for a system to present usability it must be simple and intuitive, consistent with conventions and norms, flexible and efficient, clear to act and react and help the user to avoid errors and make it possible to recover from errors. Individualization is adapting a system to the needs and preferences of the user parameter that many systems fail when they offer few possibilities to manage learning activities. The supporting technologies needed to access the network and therefore the PLE may consist of customize input devices (such as mice) with configurations ajusted to the characteristics and needs of the user, or equally configurable data output devices (such as voice synthesizers). In adapting an PLE to students with disabilities, the (common or specific) curriculum should be considered for the selection and creation of tools, resources and activities, as shown in Figure 1, which presents Model for Replacement, Transformation and Increase (STeA) of a PLE proposed by Pearson, Gkatzidou, & Green [7].
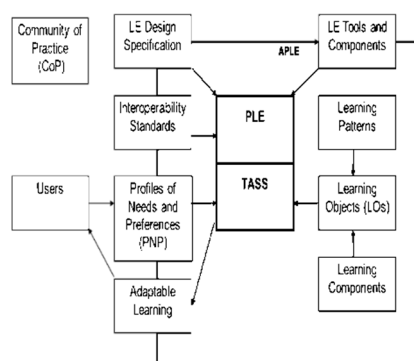
Figure 1. Personal Adaptive Learning Environment Model [7] (p. 755).

2.4. Intellectual and Developmental Disabilities (IDD)

It is important to differentiate the typologies of disability around which this approach will be developed. The IDD, which in the multidimensional conception of the American Association on Intellectual and Developmental Disabilities (AAIDD), results in "significant limitations both in intellectual functioning (reasoning, learning, problem solving) and in adaptive behavior, which covers a range of everyday social and practical skills and originates before the age of 18" [9]. This definition and classification represent a change in attitudes towards disability in general and IDD in particular and an important advance in the etiological study of this deficiency [10].

3. Methodological Approach

3.1. The Research Problem

The aim of this study is to compare the contribution of ICTs, in particular of APLEs, to the Improvement of Learning in Individuals with SEN in different contexts namely the public and private or cooperative systems.

3.2. Comparative Methodology

Considering that research in education, based on the objectivity of scientific knowledge, seeks to determine globally applicable universal principles in any context, comparative research can reveal theoretical and methodological fragilities by establishing relationships of cause and effect without considering particularities. As described by Nóvoa [11] comparative research distances itself from the homogenizing perspective, consecrating a conceptual framework that highlights particular characteristics of the phenomena studied.

Units of Study

Data from 2015/2016 [11] reveal the number of students with autism spectrum disorders in Portuguese compulsory education, as seen in Table 1, even though the total number of students with IDD it is not defined.

Table 1. Autistic Students in structured education units in 1.º ciclo, academic year of 2015/2016. Central and Total Region of Portugal [12].

	Portugal Continental	Região Centro
TOTAL	**1878**	**507**
1.º ciclo	878	227

Given that the Special Education schools in where data are to be collected, only offer IDD students the possibility of attending Basic Education until the 1.º ciclo, we will focus our attention on this level only.

3.3. Case Study Method

The present study is part of a case study seeking to explain a particular social and educational reality preserving its whole and its uniqueness [12]. Research will seek to achieve an emancipatory nature considering that the ultimate purpose of this study is to put researchers' knowledge and skills at the disposal of study subjects to improve their skills and abilities [13].

3.4. Data Collection Instruments

Considering the nature of the study interview, questionnaire and observation techniques will be used. With this methodological option, using what Stake [1] designates by methodological triangulation we are aiming for a enhanced knowledge of the reality that we propose to study.

3.5. Final Considerations

Considering the state and purpose of this study, it is worth mentioning some issues considered fundamental to the development of this research such as (a) Special Education and Social Development in a perspective of Inclusion, (b) the importance of Special Education in the current society and the promotion of respect for diversity in Educational context, (c) a current perspective of the contribution of ICT/ET (Educational Technology) to the promotion of Inclusion.

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