ICT-based Methodology for Fostering ADHD Students Inclusion in Classrooms

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ABSTRACT

ADHD is a disorder of child and adolescent neuropsychological development which principal characteristics area inattention, impulsivity, and hyperactivity. These symptoms can be due to difficulties in self-control and in planning capacity but in general, they are not associated with an intelligence deficit. The present article aims at defining a teaching methodology able to promote teaching strategies based on the use of digital technologies. The idea is to offer teachers an ecosystem of tools through which they can create teaching modules designed to make students with ADHD more involved. The result is to provide students with ICT-based didactic modules able to offer more cooperative and inclusive educational activities. The idea is to demonstrate how solutions thought for including students with ADHD can improve all students in terms of acquired competences and in integration among classmates.

KEYWORDS

ADHD, Inclusion, End-User Development Learning Methodology, Ssw, Teaching Methodology

INTRODUCTION

Attention deficit hyperactivity disorder (ADHD) is one of the most common childhood disorders and symptoms include difficulty staying focused and paying attention, difficulty controlling behaviour, and hyperactivity. Students with ADHD cannot focus for long periods and, by comparison with their classmates, they could become less motivated to participate in the educational activities. Anyway, ADHD has not to be an excuse for challenging or poor behaviour. However, it offers an explanation why some children struggle in some aspects of school life. The aim of this paper is to investigate a methodologies and styles of teaching and learning, able to combine traditional educational activities with more engaging and cooperative ICT (Information and Communication Technology)-based ones. We focus in particular on the participatory and creative technology able to carry out benefits both ADHD students and their classmates. The technology tools and software at the base of our methodology, aim to level the playing field by capitalizing on kids’ strengths, while working around their challenges.

The aim of this paper is to investigate how to involve teachers in modifying traditional educational activities with more engaging and cooperative ICT-based ones. We are not exclusively interested in what is taught or learned using ICT, but rather in how the students can employ these tools in practice in cooperative and more inclusive way.

In the next Section of this paper, we present an overview of assistive technologies can help students with ADHD achieve success by working independently. These tools enable students to

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organize their work through interactive systems that help them in writing, spelling, reading or doing the math. These tools aim at helping students to work within a clearly defined framework to achieve a positive educational experience, improve outcomes, resilience and mental health. The analysed tools offer solutions for helping ADHD student to be more independent but they miss in achieving another important challenge in this field. ICT has to be adopted for offering solutions able to improve the cooperation between ADHD students with their classmates. The aim is to propose a methodology capable of actively include ADHD students but at the same time to improve the quality of the teaching process for all students in general. Attempts at adopting ICT to change and evolve educational practice has proven challenging to developers and researchers, and the results are often unimpressive. One plausible explanation for this distance between vision and outcome is that in studies with focus on technology and learning, the stakeholders (students and teachers) are rarely involved. The active participation of teachers and students in such projects is of paramount importance, especially if there are students with ADHD. These objectives can be achieved by teachers who are not technical experts but know well the context of work and have the competence for creating new learning strategies. This need to design a framework for teachers using which they can combine different tools and software according to their teaching purposes with the aim of involving their students in new exciting learning experiences.

For the methodological part, in the paper we discuss how interdisciplinary stakeholders can bound together by common objectives but having different roles and competencies according to the natural disparity that characterizes their work activities and processes. The involved stakeholders constitute a Community of Interest (Col) (Fischer, 2001) formed by distinct Communities of Practice (CoPs) (Wenger, 1999), having different requirements which have to be met by designing specific functions in the ecosystem. A CoP is a group of people who share a common practice and address a common set of problems (i.e. ICT and HCI experts, teachers and medical authorities, students). CoPs involved in the design of an ICT-based learning system represent a Col, defined as a “community of communities” brought together to solve a problem of common concern. According to the presence of CoPs having different competencies, to design and develop our ecosystem of learning tools correctly and cheaply, it requires new approaches to software development including tools and practices that reflect the changing needs of designers and developers. This Cultures of Participation (Barricelli et al., 2015) leads to a redefinition of End-User Development (EUD) concept as a practice for supporting no experts in computer science in designing their services and dataflows (Costabile et al., 2007; Petre and Blackwell, 2007). EUD aims at extending programming capabilities to a wider range of people, beyond professional programmers, in a way that will help these people achieve important objectives in their daily activities. A detailed overview of possible applications to use for creating our ecosystem of tools is presented later in the paper. One of the main risks in designing tools for teachers is to force them in spending time and efforts in tasks aimed at configuring software and hardware components that are in constant flux. This is a typical task for ICT and HCI (Human-Computer Interaction) experts, whereas teachers have to focus on other tasks aimed at creating teaching modules. Moreover, teachers have to be helped by medical authorities (psychologists and ADHD experts) who are in charge of finding strategies to better involve ADHD students in order to help them to be more motivated to participate in the educational activities. The idea is to empower teachers, psychologists and ADHD experts for making them become unwitting developers of their own ICT-based environment. This paper presents the theoretical basis for supporting the definition of a new teaching methodology. The proposed methodology is designed around an EUD strategy addressed to provide three CoPs, respectively of ICT and HCI experts, teachers and medical authorities, and students, with proper environments can be used for combining different ICT tools. The final expected result is to frame teaching modules able to offer more engaging, cooperative and inclusive ICT-based educational activities. The idea is to demonstrate how solutions thought for including students with ADHD can improve all students in terms of acquired competences and in integration among classmates.
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