EDUCATIONAL IMPLICATIONS OF THE DIGITAL REVOLUTION

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Abstract - The main goal of this paper is to explicate major unintended consequences of digital technology for young users. It is argued that due to brain plasticity the brains of young users are by necessity modified to reflect the needs and requirements of the digital era. Chief among them is the trading of the ability to concentrate for speed. This inevitably augments attention deficit and significantly reduces internal life.

Keywords - Brain Plasticity, Speed of Information Processing, Attention Difficulties, Internal Life .

I. INTRODUCTION

It is easy to sing the praise of the opportunities provided by new technologies. The educational domain is no exception to the potential benefits of computers, cell phones and easy access to all the information available on the internet. It is thus not surprising that many novel programs based on computer assisted learning compete for the interest of educational authorities [1]-[3]. The relatively obvious diagnostic features of these programs provide better individualization of the learning process, as well as a more engaging learning experience than the standard classroom format [4]. These characteristics are often applied to the entire spectrum of pupils ranging from the learning disable all the way to the highly gifted ones. The ability to be in almost constant touch with one's friends and peers is yet another clear advantage of the digital era, one that youngsters learn to utilize very early in life. The frequency and immediacy of information sharing can often enhance social integration and self-confidence of young children. It is this social advantage that becomes one of the main reasons for parents to provide their children with the technological gadgets relatively early in life. No parent wishes to be the source of their offspring's isolation. However, none of these positive features is without its costs. Thus, unfortunately, there is growing evidence about the potential to turn the power of social networking against some of its users, whether by shaming or otherwise turning them into victims of a cruel peer group [5], [6]. The danger of such constant harassment cannot be underestimated, as witnessed by instances of youngsters being pushed to taking their lives [7]. Needless to say, the challenges to parents, teachers and educators of gaining some limited control over social networks from which they are basically excluded, cannot be overestimated. The main goal of this analysis, is to point out yet another, often neglected danger, based on the nature of the digital technologies themselves. It refers to the ways in which these technologies modify the brains of their users. Our brains have an incredible capacity to adapt according to the needs of the environment in which we operate. This brain plasticity is one of the key elements of our species' capacity to survive in dramatically changing environments. Whereas biological evolution was a very slow process, cultural evolution moves in leaps and jumps within a single generation. Nowhere is this dramatic speed of change more prominent than in the area of digital technologies [8]. It is hard to believe that a generation ago there were no i-phones, computers were only for a few professionals, and internet itself did not exist. Instead of googling for information we had to visit libraries and spend long times searching for what we needed. When travelling we had to read maps rather than use GPS, when calculating we had to rely on our memory of the multiplication table, and when communicating we had to write and send a letter by the post. It probably sounds impossible to the young generation who was brought up by having everything at their fingerprints almost immediately. It is thus not surprising that growing up in the digital environment inevitably made our brains better able to cope with these new requirements. Consider the following findings: American youngsters spend 33% of their free time on the internet and that is excluding cellular phones [9]. Adolescents in the USA receive on the average 2,272 SMS messages in a month [10]. That is more than 70 per day, and they all need to be answered. Television watching went up to 153 hours a month, making 5 hours a day [11]. By comparison, book reading went down to 49 minutes a week [12]. Inboxes are checked tens of times a day, and all in all about 8 hours a day are spent watching some form of electronic screen [13]. Hyperlinks are typical distractors and users of the internet jump from one screen to another, rarely spending more than 25 seconds on a single item. In other words, the digital generation does everything very quickly, very superficially, and is constantly distracted by new information. The way we now use language is also undergoing a major shift. While not long ago the writing of a letter was a mental activity that might have taken hours or even days to accomplish to our satisfaction, in the era of endless emails we typically spend a minute to phrase a quick and rather shallow message and send it immediately. Needless to say, our vocabulary is by necessity rather limited and shortcuts save precious time. The main casualty of all

this is the ability to focus and maintain concentration for some in-depth thinking. In a way, young people are continually training to have attention deficit. It should come as no surprise that statistics about the prevalence of AD support this to an alarming degree (14). If all mental tasks could be carried out satisfactorily by fast cognitive processing, the cost of these changes in the modus operandi of young brains would have been relatively minor. However, there are some very important tasks that require deep concentration and protection from distraction. Chief among them are some forms of creativity, and engagement in one's internal life. The latter cannot be effectively carried out while one is bombarded with new stimuli that require immediate attention. On the contrary, relatively long and undisturbed periods of reflection are necessary for both original creativity and a rich internal life. Unless we want to give up on these unique and precious products of our brains, education must find ways to limit the unintended damage of digital technologies by either reducing exposure, or actively compensating young brains deprived of sufficient practice of deep concentration.

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