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Manfred Spitzer: Digital dementia: What We and Our Children are Doing to our Minds. Brno: Host, 2014

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Manfred Spitzer's book from 2012 called *Digital Dementia* (Brno: Host, 2014) is remarkable, brilliantly-written and well translated. The author is a German neuroscientist and psychiatrist in a leadership position. By the book title – digital dementia – Spitzer refers to the term *digital emigrants* that labels a generation of people born after 1980. This generation grew up with computers as a natural part of life. Spitzer primarily disapproves of excessive playing of computer games, relying on the ease of obtaining information and external information sources that replace deeper understanding. Since the publication has received a number of reviews even in the Czech press (to say nothing of foreign countries), it is very likely that this book will influence the opinion of the general public. And because it also affects the computer rehabilitation, we should become familiar with the author's opinion.

Since the beginning, Spitzer makes it clear that he is prejudiced against the digital media (e.g. he uses sentences like “Compared to the real world, there is more lying and cheating in the internet environment and this in turn affects our own behavior” (p. 70) or “If you want your child's school results to get worse, buy him (or her) a video game console.” (p. 184). Nevertheless, his prejudice is based on long-term interest in the issue. Arguments such as “Digital media are causing the decline of education among young people” (p. 200) and “at a closer inspection, repeated praising of the digital skills of the young generation vanishes into smoke” (p. 193–194) extend throughout the book. The book is dominated by a warning message: “those who spent a lot of time using audiovisual media in early childhood have already affected the brain development, especially the normal development of speech” (p. 269).

Spitzer presents the internet addiction as a warning sign for the future. In South Korea, approximately 12% of schoolchildren are addicted to internet (p. 70). In 2009, the US children spent in average 11 times more time watching television (approximately 4.9 hours per day) than reading a book (p. 14). In Germany (2009), the average student of the ninth grade spent 7.14 hours with electronic media (television, video, DVD, chatting on the internet, computer games; this does not include mp3s and mobile phones).

Spitzer claims that the brain behaves like a muscle; it grows when used and atrophies when not used. Cognitive training takes place automatically during the mental and physical effort. Mental effort lies in the active dealing with the world. Mental efficiency is related to the amount and depth of the mental tasks/actions performed. Computers are not optimal teaching aids, because learning process requires an independent mental work and a deep engagement in learning. The deeper we get engaged in learning the better we manage it. The depth of mental work is replaced by digital shallowness. The praised multitasking actually represents attention deficit disorder. Digital media cause problems with self-control. The excessive use of digital media is related with undesirable phenomena such as obesity, stress and sleep disorders.



According to Spitzer, there is no evidence that modern information technology used at schools would improve the teaching. On the contrary, it leads to superficiality. If we count on finding all information on the web or in the computer's memory where they are stored, it weakens the motivation to remember new knowledge. Relying on external resources leads to weakening the knowledge. Thereby, it reduces the possibility of a future independent intellectual work. When comparing use of a pencil and use of keyboard, writing with pencil activates the brain better. The combination of fine motor skills and learning is more effective than static observation of a screen. The use of digital media creates only few sensorimotor effects and thereby contributes to the decline of education. Computer games, especially the violent ones, promote violence in society. Video game consoles support poorer school performance. If we want a meaningful use of computers at schools, we need pedagogical concept and appropriately trained teachers above all. As an argument Spitzer uses the results of studies in which the use of computers led to attention disorders at an early age and to learning disabilities at preschool age. Nevertheless, he does not believe that digital media could accelerate, deepen or otherwise improve the process of brain education (p. 195). Spitzer says that those who want to get information about the real state of things must go through a 150-year-old process of understanding called Hermeneutic circle. It refers to the idea that the whole is established by reference to the individual parts and the individual parts are established by reference to the whole – the acquiring of real knowledge does not happen through surfing on the internet but through active learning. Saving substantive content in brain depends on the depth of processing. Because of the new digital media we do not need new universities. Learning takes place only if there is a personal relationship between teacher and student – a teacher who manages to inspire the student.

According to Spitzer, people who access the virtual world by just one click, are significantly less capable of thinking about this world than those who try to understand the real world. Apart from the research studies the author cites even personal experiences of people who write to him: they mention that the longer they use the internet the more difficult is for them to focus on writing longer passages of text. Spitzer argues that when relying on external aids such as computers, more errors occur than during specific measurements. He also compares measuring with a tape/ruler and measuring with the use of computer program.

In one chapter Spitzer focuses on multitasking. He argues that the much praised multitasking works negatively against another significant process, cognitive control, and that a long-term multitasking can train the attention (as the admirers of these parallel processes say) but also disturb it. He shows it on a study that uses n-back: here, multitaskers had worse results than non-multitaskers. Spitzer interprets this study in a way that people using multiple media at the same time are less able to subdue irrelevant stimuli.

The author also tries to draw conclusions from the rapidly growing number of computers in households. In the 80s people who bought computers had usually better school performance than the others. According to a PISA study, 20 years later, people who own a computer have poorer school performance (p. 115). The main reason of these results is the fact that the computer is primarily used for playing computer games.

Spitzer presents the risks to relationships between people and to social behavior. Intensive use of online social networks reduces the number of real friendships, limits social competence and atrophies the areas of brain that are responsible for this behavior (p. 116). He believes that young people know less and less how a real relationship works; the internet is full of negative social contacts.

Those who are interested in computer rehabilitation could be also interested in the chapter called “training the attention on computer” (pp. 226–227) where the author quotes a study made by Green and Bavalier that was published in Nature journal. This study was testing the impact of playing action games on attention and actually proved that the effect is positive. Spitzer disputes the results and shows that in fact the players of shooting

games “voluntarily weaken their attention and self-control and thereby lower themselves to a mental level of an automatic machine” (p. 228).

Furthermore, he quotes the results of another British study (Owen et al., 2010) from Nature journal in which over 52 000 people were examined using 4 neuropsychological tests and then divided into 2 experimental and 1 control group. Both experimental groups were doing for the period of 6 weeks computer training sessions (3 times a week, at least 10 minutes a day, an average of 24 sessions on the computer), the control group did not do any computer training. Over 11 000 people completed the training. In all three groups, there was a slight improvement in neuropsychological tests. Therefore, when compared to the control group the training did not bring any significant change. The authors of the study say that although we can not exclude the possibility that similar approaches such as cognitive training with a coach can be beneficial in certain cases, we believe that our results confirm that 6-week computer training brings nothing more than answering simple questions concerning general knowledge using the internet.” According to Spitzer computer training is not effective for the brain. The general mental performance would not improve and “except these fact, the long-term effects of the time spent on computers and on the internet (either work or free time) has not been properly examined.” Rather problematic is the selection of just one study out of a large number of studies dealing with the effectiveness of computer rehabilitation. The subjects trained at home with minimal training quality control and with varying degrees of training frequency. Spitzer thus neglects a number of other studies of better quality.

All in all, the book is readable and it summarizes the information that are rather scattered in other literature. The author’s enthusiasm and beliefs are evident. If filmed Spitzer’s book would be very close to the vision of the movie Idiocracy (2006, directed by Mike Judge) which impressively portrays the future dumbness of humanity, reduction of average intellect, primitiveness and materialization.

In the opinion of the computer rehabilitation reviewer, the book mainly claims:

1. Computer training “contamination” by other digital media is very serious methodological problem that can negatively affect the results of training. If children/adults apart from computer training “consume” other technologies collaterally or serially it is very likely that focused attention on training will be dissipated. Presumably it can weaken the training results but it may also amplify them (which goes against Spitzer’s assumptions). Anyway, we do not know how the use of other digital technologies affects the computer training. Maybe the future studies should focus on how our performance gets affected when we use other technologies in addition to computer training.
2. Spitzer omits the results of other studies that deal with cognitive rehabilitation. E.g. n-back he mentions himself is the basis of a number of rehabilitation methods (Cogmed, the programs of Anna Páchová in Czech Republic). Dozens of studies with Cogmed program predominantly confirm the effectiveness of working memory training. There is an agreement on the supposition that training memory is the essential cognitive function and a condition for the ability to concentrate. The Czech program by Anna Páchová is aimed at the working memory training and has been tested in Czech and Romani children. The author found significant improvement in both groups in memory tests solving. Effect on intelligence was found only in Romani children.
3. Spitzer laughs at the idea that computer training can prevent dementia. In his opinion, there is no proof of positive, to real life transferable and perceptible effects (p. 282). He considers the training literally “useless”: “If you are serious about the brain jogging that should improve your psychic condition when you retire, turn off the TV or computer screen, invite your grandchildren and go with them for a walk in the

woods” (p. 283). In this case, Spitzer does not show any significant evidence that would prove his arguments wrong. Proven evidence of the efficiency of reduced risk of cognitive decline (non-computerized, especially mnemonic memory training) is seen as high compared to other examined factors such as eating vegetables, Mediterranean diet, omega-3 fatty acids, physical activity and leisure time activities (Williams et al., 2010). However, a number of studies have proven the effectiveness of computer-administered cognitive rehabilitation, for example Cha and Kim (2013). Although some questions remain unresolved – especially the quality of transfer to untrained areas and the question of long-term gains from the training – at least the short-term effectiveness of computer training is largely considered proven.

4. Spitzer tries to look at the comparison of training effectiveness in training supervised by a human coach and computer training. There is a study that compares the effectiveness of cognitive rehabilitation of speech under the supervision of a therapist vs. computer rehabilitation. This study discovered similar results in both devices (Schoenberg et al., 2008). Other attempts try to enable control over persecutory hallucinations using computer software with an “avatar” – a computerized alter ego of the patient’s psychotic hallucinatory pursuers (Leff et al., 2013).

Spitzer rightfully warns against the superficiality caused by the excessive exposure to digital media, however, he ignores the possibilities that could bring the proper use and appropriate application of digital media.

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