



The Rewired Generation

Stepping into the Gap that is the Digital Divide

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Abstract

Recent developments in neuropsychiatry suggest that the brain of the current youth generation differs in its neural circuitry to that of previous generations. What this means is that they are hard-wired into technology and their very understanding of the world they live in is from within this digital realm. This has huge implications for the education system as the modern generation pushes away from traditional learning environments. Educators themselves are not equipped to deal with this fast paced youth that demand immediate gratification, and create their own content whilst shaping their own worlds. This gap between the world of the digital natives and that of the digital immigrants is termed the Digital Divide and it is growing wider. To bridge the gap, the onus is on the digital immigrants to make efforts towards connecting with the Net-generation by accepting the lure of technology for the youth, and examining the impact it has on their cognitive, social and emotional functioning. The paper uses a cognitive developmental perspective to explore topical issues such as fragmented attention spans. Next it is questioned whether the current generation is in fact a smarter generation. To this end, declining traditional skills such as reading are examined by juxtaposing newly developing skills sets that are emerging on account of technological exposure. The debate around the claimed proficiency in multitasking behaviour so integral to the digital generation is also explored. The paper concludes with a look into the frontal lobe development of adolescents and its role in self regulatory behaviour and empathy.



Introduction

Today's youth is a different generation to any of the youth generations that have gone before. Yes, there has always been a youth market, but the 21st century youth differs in both a neurological and emotional manner from previous youngsters. The radical shift has occurred most rapidly over the past decade, as technology continues to advance at an unprecedented pace. These children live and exist in a digital realm which they find as natural as the air they breathe. Parents and educators struggle to keep up with this fluid generation who does not like to be put in boxes, and also defines itself and reinvents itself daily. Change is the constant, and they embrace it and run with it, ever on the search for the next piece of digital news or technology that keeps them in the loop and in the peer-based power seat. For the youth market, knowledge is power and social currency.

As much as the adult market keeps pace with technology as part of its daily functioning, especially in the business world, the youth market actively engages with it, and in fact demands a strangely dichotomous blend of increasingly complicated technology to simplify their digital lives and streamline their communication platforms. The youth market has been termed the digital natives as have all those who have been born with a computer mouse in their hands. Those entering into this world from pre-Windows times are by definition the digital immigrants in as much as they have moved into this world, either with enthusiasm or in some cases, merely as a means of survival in the 21st century. The native versus immigrant terminology was interestingly coined as far back as 2001 by Mark Prensky in his seminal work describing the differences between the generations. As an educator with a digital bent, he already noted over a decade ago that "our students have changed radically. Today's students are no longer the people our education system was designed to teach" (Prensky, 2001)

The youth market today is a fascinating generation, and the most complex that has ever walked the planet. There are no precedents to follow in the case of their online behaviour, and the psychological, cognitive and emotional ramifications of their digital engagement is one that can only begin to be studied. This generation in a sense are the guinea pigs, and only longitudinal studies commencing in the present day and culminating when today's teens reach adulthood and working status will tell how they function and indeed create the future society they will control.

Psychologists and educators, and no doubt many parents, contemplate the future of this generation and a myriad of questions are being posed by those interested in the wellbeing of this group. The paper that follows will aim to highlight some of the current behaviours and challenges posed to this wired generation. The body of the paper that follows will discuss some of the most prominent behaviours noted in the digital youth market from a cognitive developmental perspective.

Fragmented Attention

The issue of fragmented attention patterns has been reported by the current author as far back as studies in 2002 (Affleck, 2002). The article under discussion first highlighted the noted lack of attention by the youth market in research focus groups involving a tracking study over 10 years. The author first became alerted to this phenomenon as the digital world began to make its mark with the pre-teen generation, leading to the coining of the term "remote control" culture in referring to the youth of the day. This was the emergence of a youth market that both craved and demanded immediate gratification, and any stimulus that did not capture the attention was zapped, flicked or surfed with the remote control device. It should be noted that at that juncture, the first screen, television, still held major sway and the second screen, namely, personal computers were becoming more popular. This was a time before the instant connectivity afforded by smart phones and internet access in the pre-teen market.



In the years that have followed, the author has become absorbed by this notion of fragmented attention. Is it that young people have forgotten how to pay attention as traditional educators believe? Or is it that they find the material presented to them in a formal environment too boring to be given credence? Larry Rosen in his book *Rewired: Understanding the iGeneration and the way they learn* asserts that it is the latter (Rosen, 2010). The digital youth is highly demotivated by current learning environments which they find slow, tedious and one-dimensional. They come alive in another realm, one where they are able to digitally seek out information on their own terms, and create and manipulate content in their own personalised cyberspace. This is a world that is inhabited and closely guarded by the digital natives, and few, if any, digital immigrant educators have been granted access.

The divide between the current set of learners and those who teach them has never been this large. In an attempt to bridge the digital gap, Rosen cites modern educationalists who attempt to bring the digital world alive in their classrooms via Smart Boards and PowerPoint presentations. Even so, these teachers lament that their students regard the PowerPoint platform as too "old school" and associate them with their parents and business practices. Thus the bar has been lifted and teachers have to stretch themselves in an attempt to engage their classes in learning traditional material that has certainly lost its appeal to the fast-paced digital generation.

This poses a huge problem to the education system, and to date no solution is clear. Bearing in mind that the majority, if not all teachers are digital immigrants trying to engage with the digital youth culture it is a challenge indeed. In the words of a Michael Lasusa, a Chatham High School (NJ) history teacher, the modern day teacher or lecturer is being pushed to become almost an entertainer in the sense that he has to constantly engage the modern youth with multi-media input (Maher, 2010). Teachers have not been equipped to do so, many of the traditionalists do not believe in breaking with traditional methods, and our schools do not have the technology at hand to facilitate such a shift at this juncture. Thus the future of our education system and our style of didactics in the new millennium is open to observation and future debate.



A Cognitively Smarter Generation?

Another new debate has emerged in recent years alongside the proliferation of technology in the lives of the youth market. In this regard it has been questioned whether children in the 21st century are showing enhanced degrees of cognitive maturity in comparison to their non-technologically immersed predecessors. In other words, are children these days accelerating through the traditional stages of cognitive development at a faster pace? Is the techno-generation smarter than the generations of children that have gone before them?

The question is certainly open to lively discussion in academic circles. Many cite children's uncanny abilities in the use of techno-gadgets from an extremely young age. Three-year-olds play with confidence on their parents' smart phones or tablets while eight-year-olds are adept at operating digital media and games or uploading and downloading content. Even children who do not own their own PlayStations or iPads in the home have been noted to be proficient and knowledgeable in the operation of these platforms. Children in kindergarten play PC games, and it is a quick and easy step to the transition into online gaming and all the Internet has to offer. Tweens and teens are immersed in the world of virtual reality and inhabit social networking sites as a second home. In the light of this, it is readily assumed that our technologically advanced youth generation must certainly be more cognitively advanced than the previous generations.



This is a premature assumption, however, and a fundamental examination of cognitive developmental theory may give us clues as to why our current youngsters may be no more mature cognitively than past youths.

Piaget's theory of cognitive development asserts that each child must pass through four distinct stages of development from birth to adolescence before he or she develops cognitive maturity. These stages occur in order, and one stage must be fully attained before the child moves into the next stage. The four stages are the Sensori-motor stage (approximately 0 to 2 years), the Pre-operational stage (approximately 2 to 7 years), the Concrete operational stage (approximately 7 to 11 years) and the Formal operations stage (from approximately 11 to 12 years of age onwards). Each child must master the cognitive milestones attached to each stage before moving into a higher order level of cognitive functioning (Isaksen, 1986).

Some factors do, however, mediate the pace at which the cognitive structures are cemented. In this regard neo-Piagetian theorists such as Flavell speak of individual differences in aptitude and experience as being accountable for some children progressing through stages more quickly than

others. Information processing theorists concur with this finding. Their studies posit that the greatest contribution to most memory and problem solving tasks is the knowledge brought to the task by the learner. A well known experiment involving memory of chess board arrangements showed that in some instances children were better at remembering arrangements than their adult counterparts. However, the crux of the matter was that the children in the study were seasoned chess players whereas the adults were complete novices (Chi, 1978).

What this indicates is that when children's knowledge in an area exceeds adults, their memory for stimuli can be superior. In sum therefore, it appears that experience and knowledge of a task contribute to memory and problem solving ability. In practical terms this means that a child playing a PlayStation game over and over, or experimenting with the functions on his parent's cell phone can indeed over time develop a significant level of expertise in that area. Practice certainly does make perfect. However, the ability to generalise that area of learning to another unrelated area comes with cognitive strategy utilisation, and that in turn, only develops during the pre-adolescent years in normal children. Past literature gives numerous examples of learning disabled adolescents, who, although in the chronological age equivalent of Piaget's final stage of Formal operations (abstract thought and deductive reasoning) are unable to generate spontaneous problem solving strategies. In the same vein, findings show that young children under 8 years of age are unable to utilize problem solving strategies in a task, even when the strategy for tackling the problem is given to them (Wansart, 1990).

So in light of cognitive developmental research, what does this mean for our street-smart technogeneration? Put simply, it suggests that although proficient in one area, the same skills are not always generalisable to other areas of cognitive functioning. In addition, practice and experience in an area such as technology, does not necessarily denote a higher form of developmental maturity, merely a proficiency in an area highly interesting and relevant to the modern generation. In other words, their skills sets may be *different* to previous generations, but they still have to progress sequentially through the developmental phases to attain full maturity.

It is interesting to compare our modern youth market to that of the youth of Victorian London. As would be assumed, our youngsters' experiences and skills sets are vastly different. Consider the children of the privileged landed gentry by way of example. These children were brought up by nannies in the nursery in the "children should be seen and not heard" culture of the time. In addition, they were taught by private tutors. The subjects they tackled at a very young age included the Classics, History, Mathematics and Literature. It should be mentioned that these young children were fluent readers by the age of 5 or 6 years of age. Their speech and grammar were also flawless. Additionally, they were also schooled in the musical arts, and many could play both violin and piano at an extremely proficient level.

Traditional Skills Sets Decline

Compared to their Victorian counterparts, our digital youth market compares very poorly in traditional learning areas such as reading. Numerous studies lament the decline in basic reading skills over the past two decades. Teachers struggle with grammar and syntax issues with teens functioning in our Text-speak generation (Moritz, 2006). Reading is also a very unpopular pastime with today's teenagers as the multi-media world of electronic entertainment beckons (Laura, 2006). Studies indicate that over the past twenty years fewer teens read for pleasure. Teachers note loss of skills in reading fluency, comprehension and interest in leisure reading. According to Jane Healy, an educational psychologist in the United States, "reading and writing and oral skills are declining along with attention spans at even the best and supposedly brightest neighbourhood schools" (Shaw, 2003). In South Africa the literacy level is dire, with Grade 6 learners obtaining an average of only 28% for languages in 2011 and 39% in 2012 during the Education Department's Annual National Assessments. (Grobbelaar, 2011) (Nkosi, 2012).

Linked to the declines in literacy levels is the youth culture's adoption of SMS Speak or Text Speak with its abbreviated and truncated spelling format. This impacts negatively on ability to write well constructed essays in high school exams, as well as the grammatical ability to express themselves in letters and emails. We could question how well the future generation will be able to function in a professional business environment when writing business emails and reports. On the other hand, others may argue that with the aid of Spell-check, the ability to spell from rote recall becomes a moot point for the digital youth. Whether we consider the side of the purists who lament the fall of the pure English language, or whether we respond by conceding that this is another further evolution of our mother tongue, we need to take one fundamental factor into account – each generation is different, and each values and embraces differing skills sets according to contextual and societal experiences.



New Skills Sets Develop



The digital youth market is noted for its advanced levels of proficiency in anything technological. This skill set is not necessarily superior to skills sets of older generations, but merely different in response to the rapid technological advancement of our times. Some of the areas where the digital natives have shown increased ability as a result of technological immersion are areas such as response times, visual-spatial skill, pattern recognition and even systematic thinking.

However proficient the Net-generation may be in the online realm, they do however have to have reached the final stage of cognitive development before they can utilise the cognitive strategies needed for online information searching. To illustrate this point, let us consider the manner in which technological advances have placed different demands on the way in which the youth market now seeks and utilises information for academic tasks such as school projects. In the past, children were confined to brick and mortar libraries for information searches, and many a long hour would be spent browsing catalogues looking for the book in question. They would then have to either photocopy or copy the illustrations from the book. Today, however, learners have an overabundance of literature and illustrations at their fingertips. A simple Google search on the Internet allows the information to flood in. However, where today's scholars have to be proficient is in the skill of sifting, scanning, selecting and organising the relevant information – separating the wheat from the chaff as it were. Thus although time spent in the hallowed halls of the school or public library is curtailed, the current learner has to allocate cognitive processing time to the hierarchical organisation and classification of information.

Latest studies in cognitive development show that the ability to conduct hierarchical organisation is critical to the proficient use of search engines in school project literature searches (Eastin, 2008). This skill is only fully developed during the pre-adolescent years, as the child progresses into the Formal operations stage of development. Thus, a teacher setting a nine-year-old class a research task based on an Internet search for relevant information, may find herself sorely disappointed at the lack of depth of information in the one instance, or the pure parroting of others' work in the other instance. Alternatively, she may be unwittingly presented with the learner's mother's "work" as the mother tries to help her overwhelmed child to source the information correctly for the teacher. In the latter instance, mothers complain that they feel they have to do the work for their children, and that the children learn little or nothing in the process. The word of caution here is as follows: although the Internet provides an alluring abundance of limitless literature sources, only a

child with the developmentally appropriate cognitive developmental skill will be able to sift, sort and utilise the data with efficacy.

It is also very interesting to note that the latest literature also warns that even adolescents using the Internet for project literature searches, show a certain lack of proficiency in doing so. The latest cognitive developmental literature reports that adolescents and children alike are distracted by pop-up menus, and often ignore the source references, and also tend to believe that what is written on the Internet is always true. This applies to both blogs with a personal and non-scientific content, as well as academic articles. The study's author concludes that adolescents struggle to discriminate fact from opinion, and thus make inaccurate credibility assessments (Eastin, 2008).

What does this mean for our educators with respect to the format and content that they teach to our wired youth? First, it becomes clear that expecting learners to absorb vast quantities of information on a particular topic may be perceived as a waste of time by the youngsters themselves. The youth of today is used to having a constant flow of information at their fingertips and Wiki and Google searches pervade their everyday life when sourcing information from the likes of celebrity news to how to get out of a difficult level on a game. When needing access to information they turn immediately to the Internet via their smart phones, laptops or tablets. Why would they feel the need to memorise long lists of facts when the facts are a touch screen away?

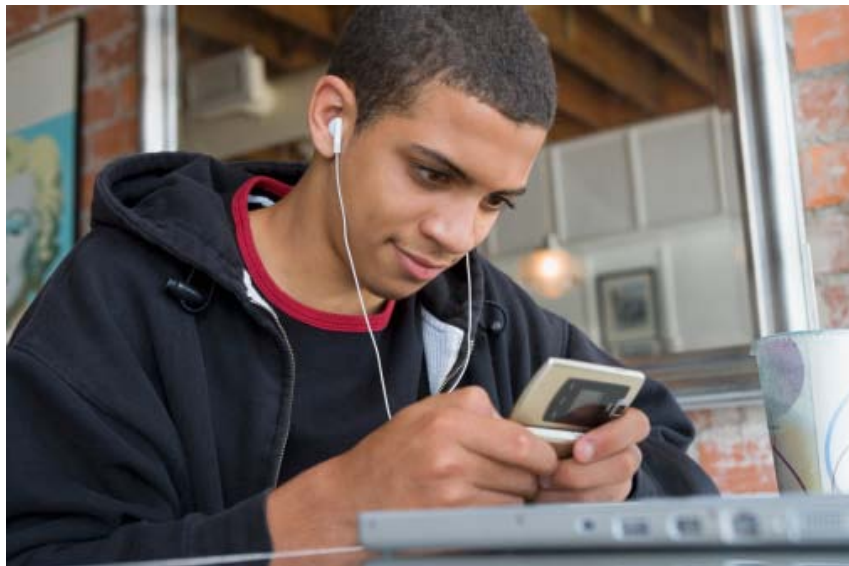


Second, educators may indeed have to hone their direction of instruction into areas that will have practical implication for academic information searches. Yes, the youth have the information at hand but it will become the task of their teachers to direct the youngsters' skills in organisational abilities such as scanning multiple sources of information, discerning the relevance and veracity of the sources, and then compiling the various sources of information into a cohesive flow that does not smack of Cut and Paste tactics. In addition, these educators will have to teach critical thinking as young minds are put to work challenging the authors from an academic, personal or even ethical perspective. With so many people stating so many opinions in cyberspace, the ability to engage in both deductive and inductive reasoning will become more important. At the same time, this allows the youth market to both develop their own opinions and become confident thought leaders in their own right. Already the rise of the confident teenager is noted by the present author in her work with the youth market over the past 22 years. It is to be lauded and encouraged, and it is the author's opinion that the confidence and optimism of the current youth generation will only spawn more confident and self-empowered adults of the future.

We move now to an area of current academic debate and even downright bickering. This pertains to the youth's addiction to the phenomenon of multitasking and more specifically, to their insistence that it does not interfere with their intellectual functioning and outputs.

The Debate of the Multitasking Generation

A proliferation of literature now abounds with respect to the youth market's praise for its own ability to conduct more than one activity at a time, and in some cases, as many as six to ten activities simultaneously. For example, multitaskers will have at least three screens open on their tablets at any one time, and will be on Facebook, while tweeting, while checking their status updates. They may also be chatting on BBM, all while taking notes in a lecture hall. Teachers remark on the youth market's insistence that they can concentrate in class whilst attending to all the peripheral multitasking activities (Lasusa, 2010). With regard to multitasking, it is certainly the claimed domain of digital natives, and the ability to multitask unceasingly is the one attribute that the youth is most proud to embrace. But the question arises as to how successful and efficient they actually are at multitasking in the technological field?



Arguments Against Multitasking Proficiency

Let us examine a recent study conducted by a team of professionals at Stanford University as a means of addressing this issue. The study under discussion utilised a student sample from Stanford University, and aimed to assess whether the brains of high multitaskers handle information differently to those of low multitaskers. High multitaskers were defined as those students conducting at least five tasks at a time, and mostly continuously. The results were disturbing and surprising to the researchers. In essence the study concluded that high multitaskers were “terrible at every aspect of multitasking. They’re terrible at ignoring irrelevant information, they’re terrible at keeping information in their head nicely and neatly organized, and they’re terrible at switching from one task to another” (Nass, 2010). In fact, the researchers were shocked to note that according to their statistical findings, there were no tasks that the high multitaskers were better at than low multitaskers. Food for thought indeed in a world where a premium is placed on time urgency traits, and the ability to meet deadlines, and decrease work turnaround time.

Traditional laboratory trials have undeniably proven that some biological facts cannot be disputed with regard to multitasking ability. The studies pertain specifically to the *nature* of the tasks that have to be performed simultaneously. Simply stated, if two or more tasks require the same cognitive processes be employed at the same time, then the phenomenon of *dual task interference* comes to the fore (Rosen, 2010). In practical terms this means that the human brain is not built to comfortably attempt two maths problems at the same time, or write an article on one topic while reading material on another subject. When one attempts multitasking in these circumstances, there is a noted drop in performance speed as well as increased errors.

These are the arguments leveraged by parents and traditional educators when witnessing the younger generation texting, BBMing, tweeting and Facebooking whilst studying for exams or doing homework. This is where the Digital Divide comes to the fore – the impasse between the youth's insistence that they can multitask versus the ire evoked in adults who likewise insist that homework and study should be conducted solely in a unitasking environment. The gap exists today and is certainly going to become greater unless the two generations can meet in a mutually conducive learning environment. Young people are vocal with regard to their contempt for the boring delivery of learning content in their schools, and to force them to focus for extended periods of time on black-and-white text books and sequential content delivery goes against their very urge to think laterally, to switch between tasks and to relate to factual information via visual and graphical representation.

We move now to the facts put forward to support the argument that not only can the youth multitask as they claim, but they *need* to do so in order to stay sufficiently cognitively stimulated.

Arguments in Favour of Multitasking Proficiency

The most compelling argument for the youth market's ability to multitask in the digital realm is that of basic human neurology – the brain of the digital native is not wired in the same manner as that of a digital immigrant. Gary Small (MD) in his book *iBrain: Surviving the technological alteration of the modern mind* (2008) notes that there is an "actual evolutionary change in the neural circuitry that is fundamentally different from that of their parents and grandparents" (p.24). He asserts that all of us exposed daily to high levels of digital technology are experiencing an evolution of our brains at an unprecedented rate. What this means from a neurological perspective is that new neural pathways are being created and strengthened while traditional ones are on the decline. As such, continual repetition of tasks on smart phones, gaming, social networking and the like allows our brains to map in and hard-wire certain skills that require the ability to scan and organise information from a wide variety of sources. For this reason, young people, who by default inhabit the digital realm most populously, have enhanced abilities in areas such as swift focus of attention, mental response times and sharp spurts of directed concentration.

Studies tentatively suggest that as the digital culture rises, so too is intelligence increasing in the manner in which we currently define IQ scores. Likewise, the ability to multitask without errors is improving (Rosin, 2010). In this regard, neuroscientist Paul Kearney reported that some computer games actually can improve cognitive ability and multitasking proficiency. (Kearney, 2007).

It is encouraging to note that innovative strides have been made in this area. Modern educators advocate that as long as dual task interference is kept at a minimum, multitasking behaviour, even in a classroom environment is acceptable, and in fact could be beneficial to the relationship between the educator and the students. Some progressive teachers have embraced a paradigm shift, by not only allowing their learners to bring cell phones into the classroom, but by actively encouraging them to search topics online that relate the lesson at hand (Chapel, 2009).

Groundbreaking research since the launch of the iPad in 2010 shows extremely encouraging results regarding the benefits of teaching via iPads in the classroom. Clark and Luckin's report (2013) on tablet based learning references over 40 studies in support of learning via tablet technology. Findings suggest that iPads support seamless learning, allowing learning to switch contexts from formal to informal, from personal to social, and to take control of their own learning. Additionally, the stimulating multitasking environment motivates and engages learners. Teachers also report that the multiple communication facilities makes communication between teachers and learners, and teachers and children more convenient. This infiltration of iPads into classrooms is most notable in developed countries where broadband and wireless access is widely available and accepted as the

norm. In our own country, we need to acknowledge that the situation is different both from the internet access perspective as well as from the cost issues associated with iPad ownership.

Notwithstanding the above, there are additional arguments in favour of young people's need and ability to multitask within the learning environment. One such argument supports the notion that learners are able to focus on a single task at hand when the situation requires it. The theory takes into account the brain's natural ability to filter out conflicting or irrelevant sensory input when one is aware that one must focus for that time period solely on one incoming sensory source. This phenomenon coined the "cocktail party phenomenon" by psychologists as far back as the 1950s is attributed to that area of brain, the reticular formation, that functions to filter incoming messages, discard clutter, and alert the higher centres of the brain when a message is important and needs to be processed as a priority (Cherry, 1953). Recent studies have revisited this filtering theory with college students in an attempt to replicate the findings and were encouraged to note that "the mind's ability is amazing, and there is no reason to believe that today's students aren't just as good at recognising when attention needs to be focused rather than split (Wood, 1995).

What is required however, further than the ability to merely filter material efficiently is the ability to self-regulate one's behaviour. In other words the young people may be *able* to filter when they choose to, but they still need the self control to *choose* to shut out one activity that may be more pleasurable e.g. Facebook and focus on another e.g. a laborious homework task.

This brings us to the next topic of frontal lobe development and its role in self-regulating behaviour. This is a hotly debated topic at present, and is certainly not resolved in academic circles. This particular topic will benefit from longitudinal study.

Frontal Lobe Immaturity

The frontal lobe is the higher order reasoning centre of the brain responsible for reasoning, organisational ability, self control and decision making. It is clear that such capacities are most strongly associated with adult thinking skills, and in most cases, inversely correlated with noted teenage traits such as adolescent egocentrism, impulsivity, and invincibility. The frontal lobe in adolescents begins to mature at the same time as the emergence of the Formal operations stage of cognitive development and in fact continues to do so into early adulthood. The important thing to note is that the teenage brain is malleable and plastic in its neural circuitry and this makes youngsters most sensitive to the impact of digital technology and the effects of technology in hard-wiring neural pathways in a manner not seen in the brains of the older generation.



The immature frontal lobe and its constant exposure to the highest level of technology is a strong area of concern for a growing number of neuroscientists. These scientists allude to studies which they say provide strong evidence that over-exposure to the digital realm, and in specific, gaming and Facebook, causes stunting in frontal lobe development. They refer to a suppression in frontal lobe functioning resulting in weakening of people skills, and a nation of youngsters with low levels of self-regulated behaviour.

Regarding the first issue of concern, neuroscientists hold up scientific evidence that they believe points to the fact that excessive computer gaming leads to a suppression of the frontal lobe functions associated in higher order reasoning in favour of stimulation of lower order brain centres controlling movement and vision (Dodson, 2013) (Brogaard, 2013). At the same time, the associated dopamine rush that is afforded by adrenalised game play is likened to the addictive physiological responses experienced by gambling, alcohol and drug use.

What concerns some researchers the most, however, is the reported decrease in teenage empathy as a result of their constant online immersion and high doses of screen time. It is a well researched fact that the developing frontal lobe of early adolescents is largely responsible for teens' longer response times in recognising facial expressions and non-verbal cues (Yurgelun-Todd, 2002). Added to this however is the added fear that today's teens are suffering from a suppression of the frontal cortex as a direct result of digital technology and lack of face-to-face contact leading to a future generation of adults who are not able to empathise with one another, and as such will remain "locked into a neural circuitry that stays at an immature and self-absorbed emotional level right through adulthood" (Small, 2008). A Stanford University study cites the statistics that for every hour

we spend on our computers, traditional face-to-face interaction decreases by 30 minutes. Neuroscientists fear that "with the weakening of the brain's neural circuitry controlling human contact, our social interaction may become awkward" and as a result we may misinterpret subtle and non-verbal messages (Small, 2008). This does not bode well for the future generation in their business dealings wherein a subtle non-verbal cue could be the difference between a winning business pitch or a lost one.

Added to this is the concern that the digital youth is becoming less self-regulated in their behaviour on account of high levels of multitasking in the gaming and social networking arenas. Again it is feared that as the frontal lobe is suppressed by excessive online activity, the ability to delay gratification is diminished. In the world of 24/7 connectivity and immediate gratification afforded by instant messaging and BBMing some digital immigrants fear the worst and query "when will that teen learn to delay satisfying every pressing whim or urge in order to completely finish a tedious project or dull task?" (Small, 2008, p. 33). Indeed this is a very important question, and certainly one that needs to be investigated further.

It is most interesting at this juncture to note that for every critic of the digital generation, there is another proponent of the benefits of digital immersion by the youth market. The standpoint of the author of this paper is that the future of the Net generation is not as self absorbed or narcissistic as some critics believe. In fact, never before have young people had so much technology at their disposal to shape their own futures, careers and ultimately, their world. They are aware of green issues; they are problem solvers and lateral thinkers of the highest order. They are critical, confident and acutely aware of all that is happening around them. They are creative in their generation of content and they are not shy to share their opinions with all in their social realm. They experiment with multiple personas online as they chat to their friends, all the while deepening their own understanding of whom they really are becoming as they move towards a maturational development of a stronger sense of self. In essence, they are fascinating.

Conclusion

Whatever the standpoint we take regarding our youth market's obsession with all things digital, we must consider the following facts: the youth actively seeks out and physiologically craves the lure of the digital realm. They find unitasking boring and dull and even nonsensical to their laterally evolving brains that are able to juggle multiple chats whilst gaming and watching television. They have been born into the digital age and they know nothing else and hence they are never going to discard this world that they so deeply inhabit. This leaves no choice but for the digital immigrants to get on board and learn to engage the cyber youth on their own terms, in a space that is relevant to them. Implications for educational systems are alluded to in this regard. Failing that, the Digital Divide will continue to widen.

This paper ends with an analogous nod to the Pied Piper of Hamelin – think of Technology as the alluring Piper. What did the children of Hamelin do? They followed the Piper into the enticing world beyond the mountain and left the adults behind to their staid lives. The message here is that there is no turning back.

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