Some Reflections on the Future of Education

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Abstract

Far from offering a tentative structured theory or solution regarding the urgently needed reforms concerning education in the 21st century, we limit ourselves to some punctual considerations of how education can prepare students for the future. Even if they are not directly connected, we hope they may help in creating the indispensable radical paradigm shift in the way we teach and learn, which is needed to meet the multi-dimensional challenges confronting global society in the 21st century. They involve the following points: an attitudinal change from memorizing to understanding; openness to the internet requirements of the present 4th Industrial Revolution; and developing a connection to Nature and our inner Self or essence, so students can get guidance in their lives and also to help find solutions for the many problems humanity faces today.

1. Attitudinal Change

By undertaking higher studies, many students aim for obtaining a career so as to become leaders in their chosen field. This warrants the ability to find and use the most up-to-date information and knowledge concerning their specialty. Therefore, a new human orientated model of education based on each student's needs and abilities has to be offered.

The first step towards achieving this involves an attitudinal change in the way we teach and learn in schools. In the "**traditional paradigm**" known as the "standard model" by the Organisation for Economic Cooperation and Development (OECD), memorizing of facts by repetition and regurgitation of sentences read in a textbook was a priority. Contents were learned by memory, which was understood as an act of storage that exclusively relied on repetition. This approach was based on a passive model of learning where the teacher was the only source of information, the supreme referent. Neither the autonomy of the pupils nor their diverse natures were considered. Consequently, many educative problems arose. Nowadays, nearly everybody accepts that purely memorizing information is a bridge to nowhere.

At the turn of the 20th century, there was a swing towards the opposite extreme into what was known as the "**modern paradigm**", **or** "**new education**", a term coined by Edmund Demolin (1898), who in 1921 founded the International League of New Schools. One of its most well-known manifestations was the libertarian pedagogy, probably best exemplified by

the Summerhill School, which was founded by Alexander Neill. In this school, the idea of freedom of the student was carried to an extreme: children should not be obliged to attend school nor to study: they need to be left to go their own way and in this way learn what interests them (Neill, 2010), because any imposed obligation was felt to lead to "castration" (Dolto, 1985). According to this libertarian approach, self-esteem is obtained based on what the child feels, rather than what he or she does. A study of Didier Pleux (2006) shows many weaknesses regarding a model like this, that is based on learning *processes, but not on contents based on memorizing.* This assertion seems to be neurologically disparate, because memory is the main learning tool used by our brains for understanding. No wonder this modern paradigm is now being challenged (Marina, 2017a).

We therefore have to look for a new **shift in paradigm** for the education of the future. But how do we decide what to choose within the avalanche of concepts, theories and educational approaches that José Antonio Marina (2017b) graphically calls *The Pedagogic Forest*? Present pedagogic efforts for solving problems create a certain confusion, because they do not seem able to offer the right solutions, in spite of the proliferation of suggested innovations, which, we have to admit, are not always so well-grounded.

These days we need to gain a more complete understanding of subjects based on fundamental conceptual knowledge, plus new ideas arising from neurosciences, developmental psychology, anthropology... It is important to focus on skills in retrieving information from where it is stored, aptitudes involved in starting a business, leading a team, approaching problems creatively, and thinking strategically. These attributes rely on "elaboration, reasoning, intrinsic motivation, and critical thinking". As these also trump straight knowledge, Andreas Schleicher, Education Director of OECD and creator of the Program for International Assessment (PISA), feels they need to be recognized and acknowledged (Aaronovitch, 2017).

Many years ago, Karl Popper (1934) pointed out that the solution to problems is more essential than just studying topics or disciplines: "we do not study topics, but problems". The main goal therefore should not be to acquire information—especially as knowledge is constantly increasing and being updated—rather the focus should be on understanding. This is not the same thing, as suggested by neuroscience's favorite analogy in comparing the brain to a computer. Like brains, computers process information by shuffling electricity around complicated circuits. However, unlike the workings of brains, the circuits of computers are understood at every level (Pribram and Ramirez, 1980). Analytical approaches in neuroscience, when used naïvely, may fall short of producing a meaningful understanding of neural systems, regardless of the amount of data (Jonas and Kording, 2017).

Consequently, future education has to shift from an educational approach that is based on standardized models to one open to all kinds of intelligence and adapts to the personalized experiences and requirements of each human being. In this way, ALL of his or her personal capabilities can be improved, especially when they are accompanied by a flexibility in attitudes when faced with an ever-changing environment. In a few words, the implication of this in this 21st century human-centered era is that education does not specifically address the quantity **of information but the quality of understanding**. This needs to be adapted to the diverse capabilities of each individual, and should be centered on increasing

creativity, empathy and leadership. The aim of education should be in providing students with a sort of compass, **a GPS, to navigate through the unknown**, as Schleicher expressed so graphically (15.09.2017, cited by Aaronovitch, 2017).

After presenting our report on this topic in the international conference on Future Education in Rome in November 2017, it was rewarding to realize that most of our above mentioned suggestions, were shared by a WAAS-WUC survey of students from diverse parts of the world (South Korea, Europe, Middle East, USA), when it attempted to identify the main topics of exploration and implementation for a future education program. The ideas they proposed at the conference (Isaković, 2017), included: a decrease in memorization, and an increase in understanding and problem solving, creativity or mental skills, such as learning how to think critically (see Table 1).

Figure 1: WAAS-WUC Survey (2017)
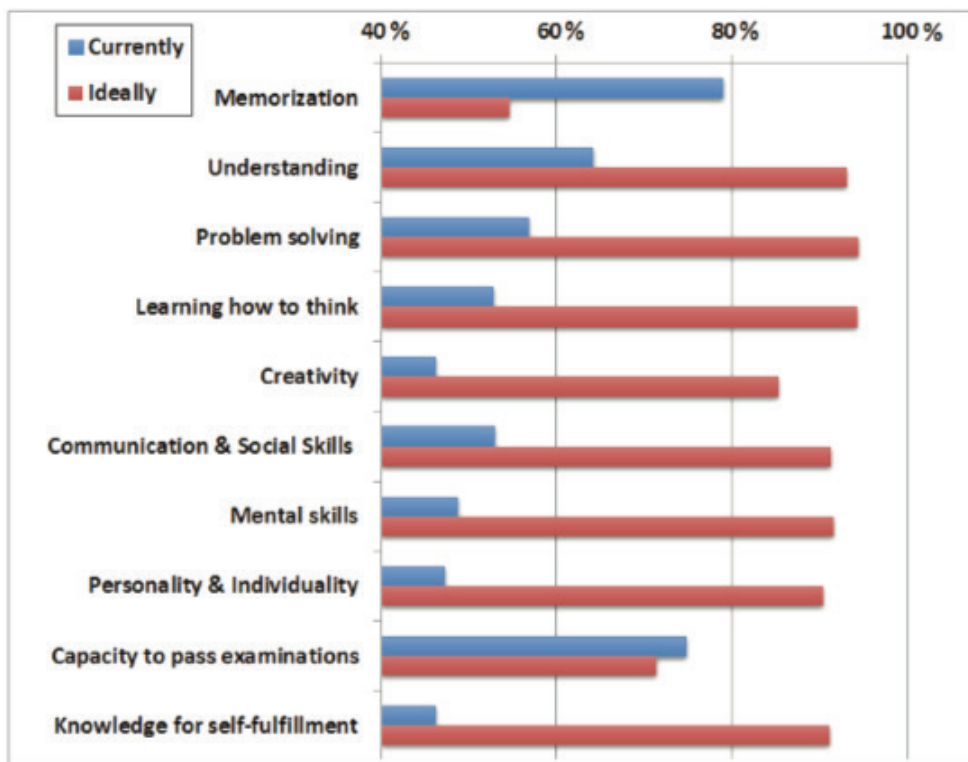
2. Openness to the 4ᵗʰ Industrial Revolution

Another important point is that we cannot close our eyes to the consequences (Ramirez and Cayón, 2017) of what Klaus Schwab has termed the Fourth Industrial Revolution (2016), which is characterized by a fusion of technologies that is blurring the lines between the physical, digital, and biological spheres: ubiquitous, mobile supercomputing, big data, Artificially Intelligent (AI) robots, self-driving cars, neuro-technological brain enhancements, genetic editing… The evidence of a dramatic change is all around us and it is happening at

exponential speed. The challenge of Information Technology (IT) is continuously rising throughout the scientific world: everybody is investing more in it and in high-tech, and each time more intelligently. This new IT era is an authentic revolution that will transform our future, increasing the quality of life: higher efficiency, more productivity and less transport costs. What is even more important is that this will transform the talent and creative capacity of human beings.

Some examples of the more conspicuous advances of the present day IT era are mentioned below:

1. **Internet:** we are witnesses of a ubiquitous and an exponential growing web. The internet has become the first global social organization, linking and bringing together different people into a single global cultural community affecting international relations (Choucri, 2013), and forging a common sense of humanity.

2. **Mobile phone** usage and Internet access have exploded. They are important for: social media; fundamental in connecting families across vast distances; needed for Internet banking, education or medical reasons; and for market trading (80% smart phones; smart cities…). In the case of migrants and refugees, their importance goes well beyond staying in touch with people back home: phones become a lifeline, and act as a GPS, which suggests where they should go and whom to trust when they arrive at a certain destination. Of course we also have to be aware that there are also important risks based on rumors leading to misinformation, or sensitive data falling into the wrong hands.

3. **Artificial Intelligence** (AI) may help improve our decision capacity, and unpick the complexity of biology (producing drugs) and advancing human health (prevention, diagnose, and therapy), given that living organisms are complex systems which process information using a combination of hardware and software. In this way, AI will make us more human.

4. **Internet of Things** (IoT) is going to change business more than the industrial revolution did one century ago, encouraging innovation and offering prediction and prevention as one of its most valuable assets; it requires inter-operability among all the different systems and kinds of applications; for instance, a smart city with a digital system enabled an ecosystem which includes citizens, universities, hospitals, companies, governments…

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IT is not free of risks: even if we cannot live without IT, we should also not forget that its use is not free of risks. For instance, social media webs, so efficient for agglutination of attention, are not appropriate for public discourse, given their volatility. They are uncontrollable, unstable, short-lived and amorphous; they appear suddenly and disperse with the same speed, showing a lack of stability, consistency and credibility, as the Korean philosopher Byung-Chul Han (2017) argues: digital communication enables instantaneous, impulsive reaction, and, in fact, it is responsible for the disintegration of communities and public spaces. Suspicions about security have also risen, given the vulnerability of the present digitally connected cyber world (Ramirez and Garcia-Segura, 2017a).

Even more so, our society is moving from alcohol and drug addiction to an **addiction to the virtual reality**. Abusive use of IT creates a dependence on virtual reality**,** in a similar way an addictive drug does: "the same behavior, the same damage: people can become disconnected from society and families and where to maintain a social relationship, a device is needed", as Sean Parke, the founding President of Facebook, asserted at a recent medical event in Axios (Philadelphia). The addiction to new technologies has increased from 0.42% in 2013 to 2.6% in 2016 (Tsitsika et al, 2016).

Parke said he has become a "conscientious objector" to social media because of the harm the social media—not only Facebook, but the wider online ecosystem—is doing to civil society around the world. He even candidly confessed that this social net, created in 2004 by Mark Zuckerberg for Harvard students, purposely hooks and potentially hurts our brains, being conceived from its outset as "addictive", with the purpose of "exploring a vulnerability of human psychology based on the feedback of social validation". He textually said:

- "When Facebook was getting going, I had these people who would come up to me and they would say, 'I'm not on social media.' And I would say, 'OK. You know, you will be.' And then they would say, 'No, no, no. I value my real-life interactions. I value the moment. I value presence. I value intimacy.' And I would say...'We'll get you eventually.'"

- "I don't know if I really understood the consequences of what I was saying, because [of] the unintended consequences of a network when it grows to a billion or 2 billion people and ... it literally changes your relationship with society, with each other ... It probably interferes with productivity in weird ways. God only knows what it's doing to our children's brains."

- "The thought process that went into building these applications, Facebook being the first of them, ... was all about: 'How do we consume as much of your time and conscious attention as possible?'"

- "And that means that we need to sort of give you a little dopamine hit every once in a while, because someone liked or commented on a photo or a post or whatever. And that's going to get you to contribute more content, and that's going to get you ... more likes and comments."

- "It's a social-validation feedback loop... exactly the kind of thing that a hacker like myself would come up with, because you're exploiting a vulnerability in human psychology."

- "The inventors, creators—it's me, it's Mark [Zuckerberg], it's Kevin Systrom on Instagram, it's all of these people—understood this consciously. And we did it anyway." (Parke, 9 Nov 2017).

- Parke's remarks were followed by similar statements of contrition from others who helped build Facebook into a powerful corporation that it is today. For instance, Chamath Palihapitiya, who joined Facebook in 2007 and became its vice president for user growth, told an audience at Stanford Graduate School of Business that he felt "tremendous guilt" about the company he helped make:

- "I think we have created tools that are ripping apart the social fabric of how society works," before recommending that people take a "hard break" from social media.

- "The short-term, dopamine-driven feedback loops we've created are destroying how society works," he said, referring to online interactions driven by "hearts, likes, thumbs-up."

- "No civil discourse, no cooperation; misinformation, mistruth."

- The entire system of venture capital funding pump money into "shitty, useless, idiotic companies, rather than addressing real problems like climate change and disease. And it's not an American problem - this is not about Russians ads. This is a global problem." (Palihapitiya, 2017).

Palihapitiya went on to describe an incident in India where hoax messages about kidnappings shared on WhatsApp led to the lynching of seven innocent people. "That's what we're dealing with," he said. "And imagine taking that to the extreme, where bad actors can now manipulate large swathes of people to do anything you want. It's just a really, really bad state of affairs." He concluded saying he tries to use Facebook as little as possible, and that his children "aren't allowed to use that shit." He later added, though, that he believes the company "overwhelmingly does good in the world."

"Research means "going into the unknown. If you know what you are going to do in science, then you are stupid! This is like telling Michelangelo or Renoir that he must tell you in advance how many reds and how many blues he will buy, and exactly how he will put those colors together."" – Albert Szent-Gyorgyi

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Antonio Garcia-Martinez, a former product manager at the company, has also said Facebook lies about its ability to influence individuals based on the data it collects on them, and wrote a book, *Chaos Monkeys*, about his work at the firm.

These former employees have all spoken out at a time when worry about Facebook's power is reaching fever pitch. In the past year, concerns about the company's role in the last US election and its capacity to amplify fake news have grown, while other reports have focused on how the social media site has been implicated in atrocities like the "ethnic cleansing" of Myanmar's Rohingya ethnic group.

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This new era of cognitive computing, with an explosive growth of online communication, will transform our future, placing an enormous educational pressure. It will lead to a shift towards a new model of education, with globalized, multi- and trans-disciplinary approaches, increasing intercultural contacts and migration (Ramirez and Garcia-Segura, 2017b). And contrary to the classical research based on results arising out

of hypotheses, a big challenge for future education will be its inability to anticipate outcomes. It is subject to unexpected results, given that it is based on less than the 2% of the huge amount of exponentially expanding amount of unstructured data we receive. The supercomputer IBM Watson has calculated that processing such an enormous amount of information would be like analyzing 340 newspapers daily. Consequently, the level of uncertainty in diagnosing our future is becoming higher and higher: we do not know where we are going, but only where we cannot remain. This is what **the education of the future has to resolve: a higher**

""Problems are not solved by apparatus, but in a man's head".."
– Charles F. Kettering

learning capacity and adaptation to the unknown. According to the 1937 Nobel Prize recipient in Medicine Albert Szent-Gyorgyi, research means "going into the unknown. If you know what you are going to do in science, then you are stupid! This is like telling Michelangelo or Renoir that he must tell you in advance how many reds and how many blues he will buy, and exactly how he will put those colors together" (Szent-Gyorgyi, 1981).

The last important message in this context, concerning machines and robots, is that, far from a false dichotomy where robots will substitute human beings, we have to combine both, with the last decision belonging to humans, because we are the ones who have to know how to use these new inventions adequately. In order to discriminate between the benefits and the eventual risks inherent in the above described world, the famous American inventor and head of research for General Motors, Charles F. Kettering, claims that "**problems are** not solved by apparatus, but **in a man's head**" (Kettering, cited by Boyd, 1957). Our challenge, therefore, is not to use the IT as a substitute for human intelligence, but to "humanize the technology, putting it in the center of all human activities, helping us to potentiate our capabilities. A consequence of these considerations is that our future schools have to include this new knowledge in its curricula, with a special focus on critical thinking, because it will probably be the most demanded and necessary aptitude."

3. Connection with our Inner Self and Nature

The world we have made, as a result of the level of thinking we
have done thus far, creates problems we cannot solve at the
same level of thinking at which we created them

Einstein (as cited in ICARUS FALLING; 2009)

In general, humans appear to have become disconnected from nature outside and their own inner nature or Self. Furthermore, these two aspects seem to be interconnected. Modern day research shows how environments can increase or reduce our stress, which in turn impacts our bodies. Whatever we see, hear or experience affects us, which not only is related to our mood, but also the workings of our nervous, endocrine and immune system. Our inner thoughts have a certain quantum of energy, and, especially when they are of an emotional nature, also affect our bodies (Lindhard, 2015). Unpleasant environments can cause stress and make one feel anxious, or sad, or helpless which elevates blood pressure, heart rate, and muscle tension and suppresses the immune system. A pleasing environment reverses that. Being in nature, or even viewing scenes of nature, reduces anger, fear, and stress and increases pleasant feelings.

Exposure to nature not only makes one feel better emotionally, it contributes to their physical well-being, reducing blood pressure, heart rate, muscle tension, and the production of stress hormones, it soothes, restores and connects (University of Minnesota 1a, n.d.) Nature based therapeutic and recreational services are now also being offered as part of educational programs in universities and research indicates the importance of nature to our health (University of Minnesota 1b, n.d.). This indicates that school buildings and the environment also have to be considered as part of the education system of the future.

"The problems we face today stem from an over reliance on our thinking minds."

Already schools designed by architects who built from eco-friendly recycled materials can now be found in developing countries like Uruguay (UNESCO Green Citizens, n.d.) and South Africa (Sustainability Institute, at Stellenbosch n.a.). In these schools the tendency is to encourage students to become involved in growing fruits and vegetables. This connects the students with the earth and they can also learn about biology first hand. This trend towards eco-friendly schools is also helping to create sustainable communities, where the inhabitants are more connected with each other and with nature. In these communities, modern technology is used to enhance living conditions, which reduce our carbon imprint, like solar or wind based electricity and cleaning of grey waters. Modern IT is also used to keep people and communities connected without imposing on them the need to live in huge impersonal urban areas.

To help mitigate the problems of today, scientists are now talking of a post-carbon era. This alternative vision "requires overcoming the deep-rooted structural failures of our current business-as-usual model" (Ahmed, 2010, para. 16) which also includes "re-defining the meaning of economic growth to focus less on materially-focused GDP, and more on the capacity to deliver values such as health, education, well-being, longevity, political and cultural freedom" (step 3). Obviously the education system will also need to adapt to these changes at all levels and support this new vision.

The problems we face today seems to stem from an over reliance on our thinking minds which has led to a lack of connection with the soul or inner Self. Education is partially to blame for this as the focus has been only on cultivating our intellectual capacity. A modern day theory of consciousness suggests that Mind-Consciousness is only one of the levels humans can access and that beyond this, there are other levels, some of which are related to the heart and our feeling capacity (Arka, 2013). This theory, known as the Six Main Levels of Consciousness, is based on phenomenological inner experiences, and not on theoretical conjecture. The third level is termed Feeling Mind-Consciousness and it generally "prevails in the heart area and can thus be called the Heart of Heart-Consciousness. It includes an emotional faculty called intuition" (p.37). In general, present day educational systems ignore that there are other levels of consciousness and that children and even the different genders might traditionally have an experiencing consciousness of a different order or level. Recent research involving training in the heart-based Intuitive Meditation method supports the third level of this theory and suggests that we have a level of consciousness associated with the feeling heart which is characterized by certain traits such as intuition, unity, peace, positivity, awareness of emotions, and connection with one's inner Self, called soul, inner being, or

atman (Lindhard, 2016; 2017). This is probably related to a level of consciousness, which is linked to the quality of consciousness that is experienced by young children prior to their learning to develop their thinking minds. Research into the heart shows that it has a brain of its own (Armour, 1991; 2007; 2008) and more information is sent from heart to the brain than vice versa (McCraty, 2009).

"Education is not about training people for the job market, but developing human beings who are more sensitive, intuitive, creative and connected with their deeper Self and to Nature."

If the aim of education is to support individuals in the development of their intuitive and creative abilities where they feel connected to their essence or soul, then future educational systems will also need to take these deeper levels of heart-based consciousness into account. They will need to learn how to help students keep the Feeling-Mind consciousness and the developing thinking Mind-Consciousness and their intellectual abilities open. Although the theory of the Six Main Levels mentions deeper levels of consciousness, it seems important that at least the heart-based feeling level is recognized and supported by educational systems. As mentioned, this does not mean that the thinking mind should not be cultivated, but that children should not lose their inner connection to their heart and to their soul. As intuition seems to arise from this level, it also seems vital that people explore this level of consciousness especially if we are to find solutions to the many problems the world is facing today, as suggested by Einstein.

Arka (2003) identifies three planes, living in the mind, living in the heart, and living in the core being. Living in the mind is living a life of sheer materialism where the rules of logic apply and nothing exists except the physical. Living in the heart is "living with depth, with feelings, with emotions, and with creativity. (Here) the heart is using the mind as an instrument to express its guidance—in emotional form, like poetry. The mind is used automatically but consciousness manifests itself mainly at the level of the heart" (p. 60). Living in the core being is "living where consciousness has manifested itself predominately in the deeper self, where your perceptions are beyond ordinary thinking" (p.61). Here the person connects with others easily as their empathy is high and the self uses the heart first and then the mind to express itself.

Although living in the core being is difficult to maintain, it seems that at least we can all reconnect with our hearts again and learn to live from this plane. Not only is it vital so we can begin to access information of a cosmic nature to find solutions for problems, we also all need guidance in our everyday lives in everything we say, think or do. As our inside and outside world appear to be interconnected, learning to live in our hearts again seems to provide a new creative way forward which not only connects us to our deeper Self, but also to nature and the greater whole.

A modern human-orientated educational system therefore needs to take these considerations into account. Education is not about training people for the job market, but

developing human beings who are more sensitive, intuitive, creative and connected with their deeper Self and to Nature.

4. Concluding Remarks

We would like to conclude with the words of the eminent WAAS Fellow, Linus Pauling, twice Nobel laureate, in Chemistry and in Peace, whom the senior author of this paper was fortunate to meet with during his post-doctoral stay at Stanford University, in the seventies of the last century:

"How can a system of law be developed to take the place of war in the settling of disputes between nations and to permit (in the words of Jan Tinbergen) a true global economy to be organized to maximize world welfare, undisturbed by national frontiers or national policies detrimental to the rest of the world? **We must provide every person** not only with adequate food and shelter, but also **with education** to the extent that he can benefit by it, **with the opportunity to develop himself to the fullest extent, to exercise his creativity, to express his personality**." (Pauling, 1970)

In this post-industrial and post-carbon era, the educational system also has to be qualified so that it helps produce more human-centered students and communities that are sensitive to helping preserve nature and the environment and where people are connected with their deeper Self.

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