



THE EDUCATION CRISIS AND HOMO ZAPPIENS

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Abstract: *The paper addresses the educational model of today and the generation of today's youth in an antithetical treatment. The former has been inspired by the 18th century Prussian model, which aimed at producing disciplined individuals, whereas today's generation of youth is full of enthusiasm, free and creative. Face to face, the two contradicting situations trigger a crisis – the education crisis. The authors highlight institutions that have renewed the innovation area - the Olin School, Media Lab, the University of Waterloo, the Finnish model, Rite Solutions, Blue School, 2.0 School. To disregard the experience of these institutions would equally lose the bet with today's education, but especially with that one of tomorrow.*

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INTRODUCTION

Today's educational model appeared in the 18th century in Prussia. Mandatory education, supported by the state aimed at creating loyal citizens, easy to manipulate and who were taught to abide to any type of authority.

The classical teaching model submits endless possibilities for political indoctrination. John Taylor Gatto considers that "the system was based on the belief that preventing the access to first hand education and fragmenting of abstract information delivered by teachers will provide for a generation of submissive and obedient graduates" (Khan 2013, 82).

Ideas were divided on subjects. They could be learnt by heart, whilst understanding more complex ideas would have required freedom and independent thinking. By the very nature of the system, discipline inhibits curiosity, and regimenting impairs on the initiative. The system undermined thorough knowledge and independent thinking. In the USA, the National Education set up the 1892 Committee of Ten. They decided that all children who lived in the USA - aged between 6-18 - to go to school for eight years and to high school four years more. They decided that English, Mathematics and Literature should be studied every



year, while Physics and Chemistry should be replaced towards the end of high school. The system they introduced has –for the most part- remained unchanged for the past 120 years. Today creative people are needed, inquisitive minds, self-motivated individuals to lifelong learning, able to propose and implement creative ideas. This is the profile of a pupil the Prussian system did not wish (Khan 2013, 83-85).

Most of teachers teach the way they had been taught, most managers behave just as the managers had done generations before them. If you have always been given orders and controlled, first at school, then at your job, how can you learn how to teach in a different manner, to manage in a different way and to be a different leader? (Wagner 2014, 333-334).

1. PROPOSALS FOR A NEW MANNER OF CARRYING OUT EDUCATION

Salman Khan, when looking for the best way of teaching and learning, discovered two principles: the rhythm of lessons has to be tailored to the pupil's needs, and not to an arbitrary program, and the fundamental notions have to be understood thoroughly in order for the pupil to be able to move a step further to a slightly more advanced level (Khan 2013, 32).

Harvard Business School introduced the teaching model based on cases some more than 100 years ago. Students are expected to read on their own a 10-20 pages presentation of a company, called case, after which they participate to a debate where participation is mandatory. The teacher acts as a mediator. The brain actively processes what your colleagues are telling you, while you come to your own conclusions, students are more involved than ever before. Ideas arising from the interplay with your colleagues will persist over time (Khan 2013, 38-40).

Ed's course is about creating objects, as he produces more value than the people in research. "My aim is to empower them. I want them to feel that they have the control over a matter and that they can do various things with it. We have courses filled with information, but true learning starts when we get into the laboratory, where they have to put into practice what they had learnt or read, the most important of all being integrating activities. I have adopted a practical approach, applications-oriented. The question of integration really appears in the open-ended projects, to which teams work. These projects are part of the three courses which lay at the basis of the master program on smart products. Students can opt to take on more and more challenging tasks as they get to learn. Empowering students is, in my view, that they can



put into practice what they have learnt in challenges that they had not been faced before, by using elements that they had not used before" (Wagner 2014, 83-88).

Bill Gates and other general executive directors uphold the idea that more and more students should attend STEM courses- science, technology, engineering and mathematics- in order to place the USA on a better position in the competition on these fields. And yet, Gates, Mark Zuckerberg, Steve Jobs, Michael Dell, Dean Kamen, Paul Allen abandoned school to follow their new ideas.

The most conventional high school and college courses share three cultural features which are completely opposed to the specificity of Ed's courses. Firstly, the first category rewards competition and individual achievements, while Ed gives emphasis to teamwork. Secondly, traditional courses are organized in order to communicate and test knowledge acquired from very specific areas, while Ed will place the emphasis on a problem-solving and cross-curricular approach. Thirdly, classical courses are rely on extrinsic motivation test scores and grades - unlike Ed's, which are rather based on intrinsic motivation exploring, empowerment, play.

Teamwork, cross-disciplinary problem-solving, intrinsic motivation and a way to empower youth which gives them the confidence they need to undertake risks, these are essential elements to the Apple culture.

2. RE-CREATORS, ICONOCLASTS AND HOMO ZAPPIENS

Tony Wagner identified the following skills of re-creators: critical thinking and problem solving abilities, network cooperation and control through influence, flexibility and adaptability, initiative and entrepreneurship, accessing and analyzing information, effective oral and written communication, curiosity and imagination, perseverance, readiness to undertake calculated risks, ability to think ahead. The same author considers that the abilities that make the difference between innovative thinkers from the other people are: questioning, observing, experimenting, networking.

An Iconoclast is a person who does something the others believe cannot be done. The brain of an iconoclast differs when it comes to perception, answer to fear and social intelligence. Neuroeconomics emerged when people understood that physical functioning of the brain imposes limitations over the way we take decisions. Iconoclasts see things



differently as compared to other people. They have identified ways to avoid the perceptive shortcuts most people suffer from. In order to see things differently, the most effective solution is to bombard the brain with things it has not encountered before, the novelty setting the perception process free from the past experiences joke, thus forcing the brain to take new decisions. Iconoclasts have a strong penchant for new experiences (Berns 2010, 15-18).

Since Homo Zappiens connected to the network, he uses his connections to solve problems. With a little help from their peers he can reach levels that have not reached before. Phoning a friend or contact him on MSN, children learn through collaboration, exchange strategies and provide clues on how to play better. The membership at "us" is stronger than the feeling of "me".

Lessons type "chalk and talk" are not attractive to young people. They simply contrasted too much with his way of working: no control, connectivity, media, no action, immersion, there is no network. ... Schools and parents tend to see children in terms of what they think the children should do in accordance with the rules and values. But this generation is the first to teach their parents how to use a forum, a mobile phone and how to make telebanking, thus is the first time we can see how reverse education occurs, an unheard phenomenon before (Veen and Vrakking 2011, 54-57).

Our generation grew up with the characters in black and white in a period in which colors were used for ornamentation and illustration. Homo Zappiens learned to use more signals to search for information, not just letters, and in a multimedia future, interaction with iconic information alongside traditional textual symbols will be a required skill (Veen and Vrakking 2011, 65).

With such a variety of TV channels, kids today discern information flow differently to previous generations. They can choose their own information and can control various educational channels simultaneously, almost like when they do their homework. For them watching television is a specific type of multitasking. It is even more intriguing when they zapp between television channels, following four or five at a time. Zapping requires anyone to know the formats and structures of the audio-visual information flows... They were watching television so much that they come to understand how producers create films, because the film involves visual communication, and Homo Zappiens understands this very well. (Veen & Vrakking 2011, 76).



The essential point is that zapping is the power that determines the essential nucleus of information in information flow and based on these cores, constitute a meaningful whole.

Competence of zapping leads children to process at least three times more information per hour than an adult. This behavior is rather a process of actively scanning the crucial cores and clues, than monitoring the entire flow of events, conversations and sequences. (Veen and Vrakking 2011, 77).

Students read only those paragraphs that seem most suitable and those they can understand the pieces of information. This ability consists of a number of extra skills. The first is to define the search queries - what is my purpose in seeking these resources? This helps students avoid limiting learning from the level of simple understanding of what others have created. The second extra skill is the ability to determine appropriate key words. The third one they develop looking at TV, getting to understand how to interpret the images.

Homo zappiens is an active learner, with a non-linear approach to formulating research questions sequence to be treated. The student is at the centre of the learning process, he decides what questions will be defined and will be answered. (Veen and Vrakking 2011, 80-84).

Tapscott believes that Net Generation values are: freedom, customization, vigilance, integrity, collaboration, fun, speed and innovation. Freedom is given by the internet use that describes a world of possibilities in terms of information. Honesty, transparency and authenticity are crucial if we want our message to reach the Net Generation. In relation to innovation, Net Generation has the ability to call a million people online in an instant (Tapscott 2011, 471-474).

Z Generation is spoilt from several points of view. However they look for things in which to get involved and to get committed. Many of them can be more than involved, but one has to raise the stakes to keep them. If you get them involved, results are awesome. "There's a spark of insubordination with this generation. There has shifted the way central authority is perceived. In communication, they remain in their positions, they can assert their position in public and they have the ability to say- that's your business, this is mine and that's it" (Wagner 2014, 49).



3. PROPOSALS FOR MORE EFFECTIVE EDUCATION

If pupils can advance in their rhythm and if this makes them happier and more productive, why wouldn't we let them all do that? (Khan 2013, 184). Such an approach would require more flexibility and more attention to the evolution of each and every pupil.

Dividing children on age groups has nothing natural in it. Anyone who has spent time with children can tell you that it is beneficial for children to interact with other children of different ages than one's own. The older ones are responsible for the younger ones. The younger admire and imitate the older ones. If we hinder such an interaction, all will miss something: the younger will lose their mentors, while the older miss the opportunity to become leaders. By refusing them the chance to teach and help the others, we eventually become accomplices to their isolation. By forcing high-school students to solely interact with pupils of their age and to care but for themselves, we treat them as children, and they will remain like that.

The school of the future has to be designed as an updated version of a single form institution, where children of all ages should interact with each other. By creating a model based on self-paced learning, it makes no sense to group children on age segments, and even less to select them on the intuited potential. Older or more advanced students could become allies to the teacher and can help those who are slower to learn (Khan 2013, 190-191).

Under the current form, the summertime is a huge loss of time and money. All over the globe, educational infrastructure is not used. Teachers do not teach, pupils do not learn. The ideal would be to replace summer holidays with a permanent educational experience, and the holidays to be taken whenever necessary, just like in any company (Khan 2013, 201-203).

When it comes to grading, in all schools both uncompromising and tolerant teachers exist. If in the same school standards vary to this point, to what extent can they be uniform at national level? If a student's grades are subjective and not uniform, why would we expect the average to be precise and scientific? A well-conceived test can give us a fairly precise idea of that the student has learnt and not of what he/she can learn, tests measuring the volume of information and not the quality of thought, hence less the character.

For student testing, Khan proposes a permanent chronology, for each year, of what they have learnt and of the way they have learnt; a portfolio encompassing creative works of each and assessing their capacity and wish to help other people. A selfless pupil will turn into



a selfless colleague. It becomes ever more obvious for everyone that being curious and creative is more important than knowing a subject. Above any grades and assessments a product created by somebody is the best indicator of the ability to create something from scratch (Khan 2013, 206-210).

Employers know that working with a student is an infinitely better evaluation than any diploma or study records. Students themselves started recognizing a counterintuitive thing: that they can acquire a faster and deeper understanding of IT working for companies such as Google, Microsoft, Facebook than reading manuals (Khan 2013, 224).

Conventional schedule is based on a collection of separate materials which are believed to be important. Suitable starting point is to ask what students should know and what they should be able to do as a result of the education they receive. This question led to structuring learning program in eight key competences:

- curiosity, the ability to ask questions and explore how the world works;
- creativity, the ability to generate new ideas and implement them;
- criticism, i.e. the ability to analyse information and ideas and formulate arguments and logical reasoning;
- communication, the ability to express thoughts and feelings in a clear and confident manner, in a variety of media and forms,
- the collaboration, i.e. the ability to work constructively with others;
- compassion, the ability to be empathetic to others and to behave accordingly;
- calm, i.e. the ability to connect with the inner life of feeling and personal development of a state of harmony and balance;
- spiritedness, i.e. the ability of constructive engagement in society and to participate in processes that sustain it (Robinson and Aronica 2015, 197-203).

Joe Bower, a professor of science and literary arts in Canada, decided that after six years of professorship that he cannot stand to use notes as the main method of assessment: "When we try to reduce something that is magnificently chaotic as the authentic learning, we always hide more than ever reveal. Finally, noting fails the assessment, because the last one is not a form of computing - is a conversation. I'm a very active teacher, assessing my students every day, but I threw agenda with notes years ago. If it is to find our way and make the act of



teaching, not scoring, the main concern of the school, then we must abandon obsession to reduce learning process and people to numbers" (Robinson and Aronica 2015, 243).

Tapscott has identified seven tips that will help us to become better teachers in this new digital era:

-do not simply throw technology in the middle of the class, hoping for good things to happen. It should be used to create a student-centered learning environment, personalized and collaborative;

-forget about lectures. You don't have all the answers. Let them discover the answers;

-allows students to collaborate;

-concentrate yourself on lifelong learning, not just the teaching and testing. Important for students are ability and love of learning all lifelong;

-use technology trying to know each student separately and create learning programs matching their pace, adjusted.

-plan syllabuses according to: choice, customization, transparency, collaboration, fun, speed and innovation;

-reinvent yourself as a schoolmaster, teacher or educator (Tapscott 2011, 254-255).

4. THE INOVATORS OF TOMORROW'S EDUCATION

The University of Waterloo is the best engineering faculty in Canada. Before graduating, a student at the University of Waterloo has undergone six practical internships with a total of 24 months at companies. While most faculty students take notes in classrooms, the Waterloo students develop their intelligence by working on real projects. They interact with employers and they are practically provided with a couple of job offers after graduation. Waterloo alumni of four or five-year cycles have acquired essential skills, a wide intellectual horizon, well - paid jobs and possibly put some money aside (Khan 2013, 226-227).

4.1 The Olin School

Olin is a small polytechnic university at Needham, Massachusetts, with a total of 350 students enrolled, 45% of whom are women. The first generation was admitted in the summer of 2002. Today, the institution aspires to redefine engineering as an innovating occupation encompassing the following: considering human and society needs, creative design of



engineering systems, creating value through entrepreneurship and charitable. "Students have to set up and manage a business through teamwork as a requirement for graduating. Olin values creativity. Another requirement is a course with practical applications called Projective Thinking, where students have to work in groups in order to create a product or a service, based upon market researches. There are three stages in the learning evolution: the first is memory-based, tests with multiple answer variants, a phase which still prevails; then project-based learning follows, where a problem is identified; finally, design and concept-based learning emerges, where you have to define the problem. We try to teach our students to come up with problems, and not to keep repeating answers (Wagner 2014, 226-228).

Students are encouraged to create their own specializations – at least a third of them chose this way. The College has set up several cross-sectoral studies. A graduate states that: "The courses at Olin have taught me how to think. They have offered me a large span of knowledge, but also something deeper. I know how to think of a problem from different vantage points. I've learnt by myself how to train myself" (Wagner 2014, 237).

4.2 Media Lab, MIT

In its 25th year of existence, Media Lab was Nicholas Negroponte's idea, professor at the MIT and of the former MIT president, Jerome Wiesner. They had the aim to organize a new cross-sectoral research lab to grant certificates of graduation and to create creative applications of the innovative digital technologies. The student courses depend on the area of study; there is no mandatory centralized curriculum.

"The key of success in the future is not what we know, but whether we are able to think and act creatively. Here, in the laboratory, we get inspired from the way children learn in kindergarten, where they have the opportunity to create, to conceive and to build in cooperation. The best way to develop creativity is to conceive and create in cooperation... The activity here makes our students go beyond the academic borders. Our challenge is to set up systems allowing students follow their interests" (Wagner 2014, 259-260).

4.3 The Finnish Model - can briefly be characterized by:

1. Having reformulated the occupation of teacher by radically revising the didactic training programs;



2. Having downsized the curriculum to several concepts deeply understood;
3. Emphasis is put on a technical and occupational education in the terminal years of high school;
4. Students are encouraged to permanently study and to choose what they study;
5. Teaching innovations of any kind are welcome.

All the programs are organized on the value of cooperation, cross-sectoral learning, calculated risk-taking undertaken, putting into practice of the trial, error and correction process, intrinsic creation and motivation: play, passion, finality (Wagner 2014, 283-284).

4.4 Idea Market

When a person starts working at the Rite-Solutions they are given 10000\$ as money encouraging personal opinion. This money is invested in ideas in an internal stock exchange. Employees are connected to the stock exchange and they can see a short description of an idea a person has brought within the company. If an employee likes that idea, he/she can invest some of the money given for encouraging the personal opinion. In order for an idea to become attractive, it is needed that the other persons make comments on how to improve that idea. The idea market is calculated on the number of comments on a certain idea. The comments are worth the double to the money invested for encouraging the personal opinion. In order to make profit, the employees have to effectively have worked a while on that idea. This phase translates the idea from the design hall into reality. The one who launches an idea has financial profit, and if the idea is successful, the respective person will work on the proper technology. This is an original way to get away with two fears hindering creativity: fear of the unknown and fear to assert your ideas in (Berns 2010, 93-94).

4.5 Blue School

Founded by the Blue Man Group, the aim of this school from Manhattan is to "reimagine education for a changing world". The basis of this school approach arising from addressing two questions: "What matters in an education to be worthy of the lives that our children will live and how is the world in which we want them to live?" The school aims at helping children grow through "offering opportunities for deep human connections through which to interact in all aspects of their lives. Their educational approach supports children in practicing



mutual respect, cooperation, leadership, mentoring, listening, personal integrity, appreciation of differences and conflict solution. Blue School helps children develop social skills necessary for success in the relationships they form throughout their lives" (Robinson and Aronica 2015, 293-294)

4.6 School 2.0.

An interesting example is Girls College from Wellington, New Zealand. By Margaret McLeod, who was director here in the late 90s, the college was a standard school, one in which the teacher would only come to teach the lesson. She is modern-thinking educator who knows that the old model of education will not prepare the girls for the digital world. When the school administration introduced computers into the classroom, McLeod hoped that the technology will be a catalyst for change educational model. An important step in this process it constituted Tech Angels program, through which students that knew to use computers, taught to the teachers who didn't know (Tapscott 2011, 249-250).

As a partial conclusion to these modern models of education, can be mentioned the words of the teacher Brantley-Patterson: "I do not tell students what to do. I help them discover themselves. I help them regain their nobility. That means education" (Tapscott 2011, 254).

Classical education sends knowledge within the classroom, but it hardly makes any comment on the life of the producer of knowledge. Behind each piece of information provided to student some can find a stubborn and bold scientist. It is equally important to speak about the history of science and of the story of scholars as well as of the knowledge produced by them (Cury 2005, 136-137).

In order to render the classroom more attractive to the pupil, Gordon and Burch propose: using music and colored lights, placing bookshelves and learning centres, inviting speakers, using practical demonstrations and colors in decorating the classroom (Gordon and Burch 2011, 189).

Academician Solomon Marcus considers that the biggest challenge the 21st century launches to the university is curricular and interdisciplinary organization. He considers that "for about 50 years the gap between the more and more cross-sectoral nature of research, of professional life and the almost exclusive organization of universities on disciplines is ever-



increasing. Thinking in algorithms, which lays at the basis of the big changes in the past decades, instead of impacting on the entire education, remains peripheral. Fragmented trends of the various subjects are not yet offset by any complementary approach, integrating and holistic, as it would happen in a 21st century culture. In knowledge, we have no choice between globalizing and specializing; we have to encompass both of them" (Marcus 2011, 25-26).

Professor Basarab Nicolescu says that: "the general relativity principle finds its human face in cross-sectoral. As a scientific concept, cross-sectoral studies the general interaction between exact sciences, humanistic sciences and the sciences of the included secret third. The survival of mankind depends of the outcome of the fight between cross-sectoral and anti-cross-sectoral. The first stake: cross-sectorial education and ecology" (Nicolescu 2013, 81-84).

CONCLUSIONS

We saw that there is a gap between the Prussian model of education and today's iconoclasts in this important field for the future of Homo Zappiens. The University of Waterloo, the Olin School, the Finnish Model, the Idea market, Media Lab emphasizes case studies, cooperation, game, active involvement of the student in the education process.

Approaching education focused on the student implies:

- smaller seminar groups;
- ability for the student to work in their own place so that the diligent may graduate sooner an education cycle;
- the increase of the optional courses number; cooperation between teachers in the cross-sectoral sense;
- replacing classical teaching with case studies;
- focus on stimulating the cooperation among students through projects, case studies, grants;
- the professor becomes the student's mentor, giving them advice in the school activity;
- summer schools;
- involvement of the best students in research;
- practice becomes the link between faculty and the business environment;
- collaboration with graduates after graduating faculty;



- more emphasis put on practice, applications, case studies, simulations, research;
- collaborating with the private environment in order to find jobs for students;
- getting involved in the teaching activity of the people in the business environment.

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