

Why $S = z \cdot i^2$?

Veselin Vukotic

ABSTRACT

This paper is looking for answers about the influence of the change of the dominant social paradigm on education system. What reforms of education system are needed today in order to efficiently overcome changes induced by this change of paradigm? Are there any directions we should follow in order to foresee future developments in this area? How can I explain my personal approach to the improvement of education system? How can we define conceptual framework for research in this area? What are directions for future development of education system?

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'Imagination is more important than knowledge!'

Einstein

THE IDEA OF PAPER

This paper has the goal to explain unique approach to improvement of education. How can I explain my personal approach to the improvement of education system? How can we define conceptual framework for research in this area? What are directions for future development of education system?

THE ORIGINS OF THE IDEA

While still being a student—probably not satisfied with university education I wondered what kind of education system had existed in Ancient Greece, which gave us so many philosophers, mathematicians, logisticians, political scientists... What kind of education system gave us Plato, Aristotle, Archimedes, Socrates?

How can it happen that ideas of people who lived 2000 to 4000 years ago are still so relevant and fresh, how can their ideas still make the base of our civilization? I wondered how this had happened, when they did not have schools, black boards, computers, notebooks... They did not even have traditional lecturing. Later, when I started my teaching carrier, I researched this as well, and I am still putting lot of effort in trying to find answers to these questions, because I feel responsible for thousands of students who study at the University of Donja Gorica, I am one of the founders of.

I analyze most of the lectures and the ideas behind these lectures from the perspective whether it can last more than 2-3000 years... Are these ideas so strong that it can last and develop during time? The ideas survive and develop in heads of generations.

I have wondered which ideas from my lectures can survive at least 2000 to 4000 days (not years)... How lasting are the ideas you represent and share with your students at classes? Do your students accept some of those ideas? If they accept it, for how long it will be in their heads? How long your ideas live in heads of people after you disappear?

How long an idea will last is an important element of quality—both of a person and an idea! Sun is eternal! A match lights up for few moments and fade away. Why do you say 'sunshine' to the person you love? Because you want his or her love to last forever... Each of us can introspectively ask him or herself which professors, which lectures, which books and ideas are lasting the most in our mind? If you answer honestly—there are very few people you remember. However, more important issue here is why is this particular professor, this particular lecture lasting? Why are their ideas still in your head?

The answer to this question is complicated! My personal experience shows that professors whose ideas I remember: (a) were passionate in their work; (b) loved and respected their students and enjoyed their success.¹ In a word, people remember those professors who are different, who put their character and personality in the education process, not professors who are rigid, uniformed and bureaucrats.

From the perspective of ancient Greek educations, it is evident that today's education system is in crisis, especially education system in our region and Europe... Current education system is based on passive knowledge, memorizing facts, 'warehousing' information, the importance of formal achievements (diploma is important by itself) and strong division between theoretical knowledge and practical problems. However, current education system is required to develop skills, competences, to influence the way of thinking, innovative and creative capacity of a student.

¹ Honestly, most of them were respected, much more then loved in the society. Why Greek philosophers were not the most favorite people in ancient Greek society, for example Socrates? I founded the answer to this question at Ayn Rend 'People hate individuals who work with passion' (Rend, Ayn 'Fountainhead').

Actually, challenges for education system are as same as always—indeed we are going back to the past—to the time before 19th century and industrial revolution. The ideas of industrial revolution had negative impact on education system, first of all—the principle of mass production. Even Friedrich Nietzsche has warned on this: ‘two seemingly opposite flows, similar in its dangerous consequences are dominant in our education institutions today—on one side, the desire to expand it and distribute it widely, and on the other, the desire to reduce it and make it weak.’² This means that first movement is leading us to mass education, and the other encourages the approach according to which people should give up their highest novel ambitions and put themselves in the service of, for example, state.

This industrial paradigm of current education system is in conflict with the trends caused by new information paradigm, i.e. information society. The background idea of this paper is to identify directions for future developments in this area.

WHAT ARE THE PRODUCTS OF THE INDUSTRIAL PARADIGM OF EDUCATION?

In my opinion, industrial paradigm of education had been created before industrial revolution. This paradigm is created along with the birth of national state.³ In other words, when education started to divide from church (monasteries had been first universities), education institutions named schools had been created. The goal of schools was to produce common spirit aimed to preserve interests of ruling class, i.e. the state. Four pillars of national state—language, army, territory and currency—are based on schooling system. These pillars lean on education system which is controlled by ruling elites, who are educated at the same concept.⁴ Many people did not agree with such idea of education. One of them was Jan Komensky, Czech author of the book ‘Labyrinth of the world,’ reformer and the head of one college in England. ‘It is in nature of school to become rigid, so occasionally we should shake it back into life. The reason

for this lost of vitality lies in the fact that political power wants to establish common will. That’s why, from time to time, both of them should be reexamined and the key idea, which was lost in daily routine, should be reinjected in them.’ Fatherly: the school should be transformed from prison to playground, which provoke and satisfy student’s curiosity.⁵

These words from 17th century sound as a contemporary metaphor!

The idea that school system should serve the dominant ideology, was followed by capitalistic ideas where education was put in function of increasing production, satisfying human needs and making profits: ‘More production and better satisfied needs leads people to more happiness—that’s a formula of success. Here, the purpose and the goal of education are to raise utility, i.e. profits and earnings.’⁶

However, this union of ‘intelligence and property’ according to Nietzsche initiated something he calls ‘animosity to education’. Animosity is understood as something that kills spirit. Nietzsche says that education is strengthening the individuality of a person, it makes somebody lonely and this loneliness (individuality) leads a person to education out of money and earnings, which takes much time. People usually want to get rid of such aspirations, usually named ‘the highest level of egoism’ or ‘immoral Epicurus education’. Dominant understanding of moral in society requires something completely opposite—quick education... The goal is that the man becomes a being who earns money.⁷

This approach to education was the foundation of the idea of rationalization (Max Weber). The bureaucratization is considered as the ultimate vivification of this process. The truth is that Weber feared that the society will turn into invisible network of rationalized institutions, and people overwhelmed with such rationalization will become individuals closed in ‘iron cages’ (bureaucracy) who do not have way out.⁸ Mises and Hayek also wrote on the dangers of bureaucratization.⁹

²Niche F. ‘Budućnost obrazovnih institucija’ (translation ‘Future of education institutions’). Sremski Karlovci: knjižnice Zoran Stojanović; 1997. 27 p.

³Bodin J. French lawyer created the concept of national state in middle 17th century.

⁴I don’t want to enter discussion about reformers and reformation movement which contributed to the development of the idea of mass education in function of serving state.

⁵According to: Barzun J. ‘Od osvita do dekadencije-500 godina Zapadne kulture, od 1500. do danas,’ (translation of ‘From Dawn to Decadence—500 years of Western Cultural life, from 1500 to the Present’ Zagreb: Masmedia; 2003. 226-227 p. Kamensky actually reacted on the measure proposed in England that all cities should build barracks for 120 boys 12-21 years old, where they would study about God. It is the purpose of education according to which a man is the servant who conducts all activities of private and public life, including war, fairly and eternally.

⁶Nietzsche F. 1997; pp 20.

⁷Nietzsche F. IBID; pp 28.

⁸Max Weber wrote about bureaucracy as of the paradigmatic vivification of the rationalization process. Although, he saw all advantages of rationalization, he was more occupied by the dangerous impacts it brings, especially with the possibility to enter ‘iron cage’ of rationalization. He considered rationalized systems dehumanized and not human, so he feared the possibility that many segments of society will become rationalized.

⁹Mises L, Hayek F. ‘O slobodnom tržištu’ (on free markets). Zagreb: Mate, Collection of essays; 2003.

From personal experience, I am aware of all dangers from bureaucratic spirit, however I think that new phenomenon of McDonaldization is making the rationalization approach even more dangerous than bureaucratization.¹⁰ I took the notion of McDonaldization from George Ritzer, who says that it is: 'the process according to which principles of organizing fast-food restaurant become dominant in many segments of American society and spread all around the world'.¹¹

It is very important to understand this relation between education system and the process of bureaucratization on one hand, and McDonaldization of the society, on another. The relation between these two is cybernetic (feedback principle) and when the idea of rationalization overwhelms education system, two of those feeds one another.

The system of education today is in the described condition. This conclusion is not based on the fact that many fast-food restaurants operate within schools or around them, but on the fact that this spirit of fast and superficial approach to everything is shaping the way of thinking of students, who become managers, politicians, researchers, etc...

It's not wondering then, that the spirit of criticism, creativity and the game is not present in education system. It's not wondering that schools and universities are educating people for the state and the society of obedient, not-thinking people, overwhelmed with fast-food logic.

Does not it become clear that current education system is focused on profession, not on thinking? It is focused on imitation and following orders, not on individual research; it creates inertial individuals, and does not encourage entrepreneurial and creative capacities of an individual.

Why is our society so religious today? I think that an average person is much more religious today, then in medieval age, which is often called 'dark age of religion'...

I use the word religion more as an association—the belief of a person in forces outside of us, which master our life and we enjoy in it. In medieval age people believed in God from heaven. Today, people do not believe in God from Heaven any more, but they believe in God on Earth—the state. The belief in God is replaced with the belief in the state (bureaucracy and politicians), belief that we depend on the state. However, there is one important difference. In middle age, people communicated with God occasionally, for example, once a week when they went to church. In the

meantime, they worked, they thought and they entered creative activities hoping that God will help them—they did not sit and wait God to bring them everything they need for life.¹² People do not go to church as often as before, but they spend every minute with their God—the state expecting that it will solve all problems they have. Are not the discussions on politics in bars, restaurants, at work just the new form of prayers and new expression of the belief in God? Truly, people today devote much more time to this communication with 'God—the state' then they used to in Middle Age. That's why we live in the 'age of techniques' not in the 'age of discovers,' as Middle age.

I wanted to point out some phenomena and processes which can provoke the reader to try to deeply understand visible occurrences in contemporary education and realize that global education system is facing, at least, mild crisis. Of course, this crisis is expressed in different forms, but it is evident that it has stronger influence on less developed areas and states. That's why this problem is more visible and stronger in our region.

Is there a cure for this? 'There are cure, but not for us,' would be the answer of Albert Camus. Is this really the case?!

WHAT ARE THE REQUIREMENTS OF THE NEW INFORMATION SOCIETY PARADIGM?

It is obvious that education based on industrial paradigm is in deep conflict with the paradigm of 'new global stage' (Kenichi Ohmae), founded on informatics and globalization. On one side, education is in crisis, and on the other it becomes necessary condition for survival of an individual, companies and civilizations.

But, what kind of education are we talking about?

It would be pretentious to hope that we can find precise answers to this question. It is impossible. However, if we go back to history, to ancient Greece and follow the anthropology of creation in different civilizations along the course of history, if we understand the history of future, we can maybe find some guidance.

In today's world information is putting more emphasis on the development of an individual, his capacities, personality and character and less on collective, the state... Information put the dominant orientation to creative and innovative capacities, more than on imitation and obedience.¹³

¹⁰Vukotic V. 'Montenegro—Microstate', International Conference: 'Economic policies for viable micro state'. ISSP: Podgorica; 2003.

¹¹Ritzer G. 'Mekdonaldizacija društva' (translation of McDonaldization of Society). Zagreb, str: Jesenski i Turk; 1999. 16 p.

¹²Many generations were educated in system which misjudged middle age, its 'backward and dark' spirit. That's why it is very odd for us when we read objective analysis of this period, which shows that middle age was 'the age of discovers' [Borstin, Danijel 'Svijet otkrića,' (translation of *The Discovers*) Beograd: Geopolitika].

¹³See more: Ohmae K. *Invisible Continent*. New York: Harper Collins Publisher; 1999.

Globalization is completely changing the role and the importance of national state, its possibility to control processes on national level. National state is opening and many national levers are weakening.¹⁴ In less than 30 years welfare state concept collapsed.¹⁵ Global market successfully absorbed many activities which were jurisdiction of state and government (including public transport, communal services and telecommunication services)—these activities became commercial. Emphasizing the concept of European social state today's reminds on reflexive moves of a dying being... We need to encourage free entrepreneurship again.

We live in the time when collective entities of all kind are being crashed, when they go through invisible substantial transformation and we are getting into 'the age of access' (J. Rifkin). We are getting into time when networks and strategic partnerships are crucial. Establishing networks and strategic partnership are strongly influencing dominant social paradigm. It is the paradigm which moves the focus of an individual from material wealth, physical goods, and property to the quality of living, experiences, enjoyment, pleasure, highly estimated leisure. We are talking about opening of the new paradigm, not about the world where this paradigm is already dominant. However, all signs are pointing to that direction. All of this means that human capital is the most important asset of a company and it is understood that 'profit is in the heads of people'. Somewhere, like here in the region, human capital is considered as expense; however an approach that human capital is the main driver of development is being widely accepted. People become aware that also human capital can be 'rented,' so the demand for 'free-lancing' experts in different areas grows. 'Intellectual capital is driving force of the new era... Concept, ideas, images, not material things are considered to be valuable object and new concept of economy. Wealth is not in material, physical capital any more, but in human imagination and creativity.'¹⁶

Information economy is encouraging long-term transfer from industrial to cultural production. The position of so called economy of experience becomes more important.¹⁷ Simultaneously, this is the transfer from the ethics of work, to the ethics of game (the ethics of challenge instead the ethics of necessity).¹⁸ Is this cultural production (production of experience) the last development stage of capitalistic life style, which has the mission to bring as many human activities in commercial sphere, is less important issue here?¹⁹

This change of paradigm is creating the environment for the new approach to education system.

An important question which is raised here is what is happening within young, new generation and its mental profile.

GENERATION ME

It seems to me that not enough attention is put on the change of system of values and the way of thinking of the young generation today. How can we speak about education system and its efficiency, if we do not know the psychology of a student who studies in it? Adler's 'understanding of human nature' is good guideline, but it is incomplete and not adapted for today's moment. There are many analyses and studies on current young generation, especially in USA. Why is it important to include factor 'generation' in the discussion about education system? Each person belongs to a generation. The time when we were born determines the culture we live in. Society and social norms in which we live while being young shape us as individuals and we stay to live with it. Many studies conclude²⁰ that the time when we were born have stronger influence on our personality, than the family which raised us. As old Arabic proverb says: 'People looks like time they live in, more then they look like their fathers.'²¹

Features of young generation, so called Generation ME (people younger than 35) are important for the discussion in this paper.

¹⁴Riderstra J, Nordstrom K. Karaoke kapitalizam. (translation of 'Karaoke capitalism'). Beograd: Plato; 2006.

¹⁵Wahl A. The rise and the fall of the welfare state. Norway: Pluto Press; 2011.

¹⁶Rifkin J. IBID. pp 13.

¹⁷Global travel and tourism, theme cities and parks, destination entertainment centers, wellness, fashion and cuisine, professional sports and games, gambling, music, film, television, the virtual worlds of cyberspace and electronically mediated entertainment of every kind is fast becoming the centre of a new hypercapitalism that trades in access to cultural experiences. (Rifkin J. IBID. pp 13-14);

¹⁸In The Industrial Age, when producing goods was the most important form of economic activity, being propertied was critical to survival and success. In the new era, where cultural production is increasingly becoming the dominant form of economic activity, securing access to many cultural resources and experiences that nurture one's psychological existence, become as important social industrijske ere, kada je proizvodnja dobara bila najvažniji oblik gosekonomske aktivnosti, imeas holding onto property. (Rifkin J. IBID. pp 17);

¹⁹Pine J, Gilmore J. The experience economy. Boston: Harvard Business School Press; 1999.

²⁰I find study of Joan Twenge 'Generation ME,' as very important. It is based on longitudinal research from 1990 to 2009, which included 1.3 million students. Don Tapekot's book 'Grow up digitally' is also very instructive and based on research conducted in USA. There is also one study from Serbia, conducted by the Institute for Psychology of the Faculty for Philosophy, University of Belgrade, 2011/2012e.

²¹Twenge JM. Generation ME. New York: Free Press; 2006.

Why this generation is named Generation ME?²² It is a generation for which the self is the highest priority. Members of this generation want freedom in everything they do; they like to personalize everything (to adapt it to them); they have tendency to research (especially through available networks). Generation ME wants entertainment and game within their work, education and social life—this is the generation of cooperation and connections (Facebook, games, homework...). This generation needs speed, not only in video games.²³

As I don't want to deeply analyze all features of today's young generation I'll just give a table which shows the generation gap between today's generation of teachers (baby-boomers) and generation ME (net boomers) according to the criterion "The Self" in different generations.²⁴

The self across the generation

<i>Baby Boomers</i>	<i>Generation Me</i>
Self-fulfillment	Fun
Journey, potential, searching	Already there
Change the world	Follow your dreams
Protests and group sessions	Watch TV and surfing the web
Abstraction	Practicality
Spirituality	Things
Philosophy of life	Feeling good about yourself

The digitalization of human life is changing almost all attitudes of young generation. The results of similar research conducted in Serbia shows that idols of young generations are people from show business, and media, not the school determines role models. In other words, public figures and media dominantly influence young people, their idols and their life philosophy.²⁵

One more thing is important for the topic we discuss about. Young people do not have real picture of the world, neither can they see relation between studying and success in life—they want to finish school without putting much efforts and become famous. As a consequence, young people have high expectations and want to achieve everything immediately, to create something that usually takes 10 to 15 years for 1 year. This bubble of high expectation is bursting in clash with reality, bringing bad end for many. The burst of this bubble is enhanced by the fact that today's

young generation is the generation which 'claim rights' and do not think about their responsibilities.

Unlike many people from my or younger generations, I will not dare to conclude that this generation is lost and lazy, and much worse than our generation.

I just say that the differences between current young generation and my generations are big—young people see life differently from us. It is important to understand the differences between the time when our and their way of thinking was shaped. Nobody has the right to blame other people for accepting prevailing cultural norms in the society he or she lives in. Just remember what was happening in ex-Yugoslavia at the time today's young generation was born and raised (from 1980's to now).

My approach is that our students' attitudes are not wrong, but different from the ones of my generation.

How can this generation gap be overcome in education system?

The first step in education reform is to identify and recognize existence of this gap. Attempts to make young people accept way of thinking of older generation result in declining influence of school and university—young people simply refuse to take education seriously, to understand it as important determinant of their success in life.

EDUCATION FOR PROFESSION OR EDUCATION FOR THE DEVELOPMENT OF SPIRIT

I am sure there will be many critics on my proposal to abandon education system focused on profession; education for well-behaving, neat and starchy citizen, which is a part of social collectivity; to abandon education for the state and turn to education for an individual, its personality and character; to educate people to be creative and educate young people to accept challenges of real life game!

I am going back to initial question raised in this paper: Why did education system of Ancient Greece give so many foundation of civilization? This question becomes crucial, as already emphasized above, especially from the perspective of the hypothesis that education system is facing serious crisis.

Trying to find answers on future development of education system, beside Ancient Greece, experience of USA can be interesting. Maybe, a part of an answer why USA are leading world force in last 2 to 3 centuries, lies in their education system? Can it happen that weakening of

²²Many people call this generation 'net generation,' i.e. net boomers.

²³Tapskot D. Odrasti digitalno. (translation of 'Grow Up Digitally') Zagreb: Mate; 2010. 56-57 p.

²⁴Twenge JM. Generation ME. New York: Free Press; 2006. 51 p.

²⁵High school professor tells in joke that girls spend more time looking for the perfect prom dress, then to the choice of high school they will attend.

USA position in global environment today can be caused by weakening of US education system? Why is European development lagging behind USA? Servan-Schreiber say that the differences in education system are the reason why Europe was lagging behind USA in his book 'American challenge'—according to the book education system in Europe did not react adequately on mega changes in second half of 20th century.²⁶

Why the model of education is better in USA then in rest of the world, especially Europe? According to findings of Marte Nussbaum, USA have never had clear model of education, exclusively oriented to technical knowledge and economic growth.²⁷ In other words, model of rationalized education, 'education for profession,' 'education for working place,' are not giving general knowledge, neither enriching spirit of a person. Can this model be appropriate for the new society which is being born? Can this model be appropriate for the globalization age, which is necessarily being developed? Can people with pure 'technical knowledge,' without humanistic education be 'the citizens of the world?' Is Samuel Huntington right when he write about 'clash of civilization'—in other words is today's education system the base of this clash of civilization? It seems that the world lies, not only on nuclear bomb, but on 'education bomb' as well... These two bombs are connected, because today's education system do not make young people responsible for their personal decisions, neither it makes them respect other people or cultures. Is current education system oriented to multiculturalism, which is essential element of globalization? People who should think with their own heads, are not slaves of province and tradition, they understand 'other people's suffering and achievements'. Nussbaum's research showed that humanistic studies and art are being repressed and eliminated by technical knowledge.

Humanistic perspective of natural and social sciences is expressed through this imaginative, creative aspect and critical opinion. Current education system have left Einstein motto: 'The imagination is more important than knowledge!' Current education system has also left Tagore's approach, who had been great innovator in education... 'His experiments have focused on strengthening students,

through studying many world cultures, introducing music, fine arts, theater and dancing in all part of education processes.'²⁸ Tagore might have been the first who noticed that current education system, 'education for profession' leads to bureaucratic insensibility and noncritical collective thinking, strong influence of prejudices and inertia. Tagore write about 'human spirit,' but not in religious sense, as many people thinks. Tagore understand 'human spirit' as 'the ability to think and imagine, which makes us human beings and which enrich our human relations, not relations of exploitation and manipulation.'²⁹ Fritj of Capra thinks that current education system lacks optimal combination of rational and intuitive.³⁰ Socrates, whose ideas are being lost in current education system, based his pedagogy on the importance of arguments, i.e. critical examination. Socrates said that 'nonexamined life is not worth for human being'.

It really seems to me that the transformation of current education system should be oriented, as Tagore used to say, to the development of critical thinking and empirical imagination, within which university is build on model of interdisciplinary free skills. This is completely opposite from current model of our universities which are based on one single topic, one single subject, not on paradigm of free skills.³¹ The fact that USA have never had education system which is clearly oriented to one specific profession made US education system superior over education systems in the rest of the world, especially Europe. USA had and still has the model of free skills built-in education systems: instead of specializing for one particular field, students are required to take different humanities' courses. In addition to it, students are put in the position to examine facts and make research.

According to all of this, education is not passive adoption of facts and cultural traditions—it is and it has to be provoking mind and accepting challenges for spirit in order to make student's mind and spirit active, competent and critical in the complex world. This education model should suppress current model within which students sit in their classrooms, absorb and memorize facts, and then just reproduce what have been served to them.

Is there any 'formula' which can explain all of this and enable transfer from one to another education model?

²⁶Servan-Schreiber JJ. Američki izazov (translation of 'American challenge'). Zagreb: Epoha; 1968.

²⁷Nussbaum M. Ne za profit—zašto je demokratiji potrebna humanistika. (translation of 'Not for profit—why democracy needs humanities.' Beograd: Fabrika knjiga; 2012.

²⁸His ideas are completely abandoned in India today—people even laugh at it.

²⁹Nussbaum M. 2012; pp 19.

³⁰Kapra F. 'Tao fizike' (translation of 'Tao Physics'). Preduzetničko društvo Ures, str. 2004. 27 p.

³¹Tagore University-Visva-Bharti (meaning 'The Whole World') was taken by the Government of India and it is now as any other university, based on education for profession.

EDUCATION EQUATION: $S = z \cdot i^2$

Is knowledge the goal of education? This question is heretically provocative, especially in time when the dominant opinion is that future development depends on how much the society is knowledge-based. Only knowledge-based society has the future—this is prevailing thought today. I do not deny the importance of knowledge; however I do not share prevailing opinion. I insist on analysis of knowledge and its importance from individual perspective—knowledge is important depending on context and its influence on personal character, way of thinking, creativity, and entrepreneurial spirit of an individual... In other words I put emphasis on the knowledge which can be transformed into individual ability of an individual to solve problems, to create something, on the ability of an individual to be geyser of ideas, not the sponge which passively absorbs formulas, definitions, factors, models, etc. which are all elements of knowledge!

In order to understand this approach, a reader has to learn two starting points:

1. Knowledge is individual—it is spread in head of individuals (Hayek)! There is no such thing as the collective knowledge! This is emphasizing the role of individual in education system, i.e. the need of education system to focus on an individual.
2. How can we understand knowledge from the perspective of individual and individual competences? In my opinion, knowledge is everything we have taken from other people. Knowledge is not something that comes out us; we are taking it from other people. We adopted our knowledge about relativity theory from Einstein; Pythagoras's theorem is taken from Pythagoras; knowledge about class struggle is taken from Marx; our knowledge about lighting rods comes from Benjamin Franklin... Thomas Man said 'all I know is not mine, but it is mine!'

These two starting points are bringing us to logical question: how someone else's knowledge is converted inside each individual? In other words, how something, as Mann said, 'that is not mine, becomes mine after all?' Can we achieve it simply, by inserting knowledge in the head of an individual, or there are some factors of conversion? These questions probably seems odd to a reader, maybe even senseless, because 'it is clear to everybody.' It is not clear to me—that's why I want to make them more clearly for decades. I'll test those who have the clear answer to these questions: why two persons who have learned (absorbed, memorized) exactly the same 'amount' of knowledge achieves different results in solving problems in real life? Is there some relation between the level of knowledge and

the results of its implementation? Does the secret of education lie in this factor which is 'well known to everybody'?

Can Einstein help us in looking for an answer to these question with his famous equation $E = m \cdot c^2$, which shows that energy is the product of mass and squared speed of light?³² This equation raise the question how mass is transformed into energy? When we speak about education, the question is how knowledge (mass) is transformed into ability (energy)?

According to Einstein's solution, presented in simplified form, speed of life is this factor of convergence—factor of transformation. In other worlds, mass and energy can be transferred one into another, similar to for example USD and EURO. Factor of conversion between dollar and euro is USD/EURO exchange rate, while squared speed of light has the same role in transforming mass into energy.

When we speak about education, what is 'exchange rate' between knowledge and the ability of an individual? In my opinion, it is squared intensity of life of an individual. In the form of equation:

$$S = z \cdot i^2$$

ž S—ability of an individual (energy)

ž z—knowledge (mass)

ž i—intensity of life (speed).

Ability an individual acquire during university education, is the goal of higher education. Knowledge is not the goal itself—it is just one of elements of this ability or competence. To explain in simple way, I understand the ability of an individual as a capacity to solve problems and find solution in permanently changing circumstances. Ability always results in new achievements, new ideas, creativity and dynamics. The ability of individual is initiating mental processes, which increase capacity for abstract thinking, imagination and new ideas. It is the background of Einstein thought: 'Imagination is more important than knowledge!'

This understanding of ability of an individual as the goal of education (not education for specific profession), emphasize the need for education system which 'produce' (as an outcome) intellectual, i.e. creative entrepreneurs. This means that each individual, no matter what he or she does, should be entrepreneurial and creative, especially having in mind the fact that average time spent on one job is 5 years or job have changed in the period of 5 years. Quick changes and moving from one job to another, rapid technology changes and globalization require the ability of

³²See interesting explanation of this equation in the book: Kox B, Forshaw J. Why $E = mc^2$? London: Dacapo Press; 2009.

an individual, not concrete knowledge for specific job... As famous Montenegrin poet Njegos said: 'Whatever comes, we are ready!' This sentence is pointing out this individual capacity to accept and overcome life challenges, which I call the ability of an individual. That is why I believe that title professor should be abandoned and title 'coach for life,' 'philosopher for life' should be introduced instead. I am not sure that Plato, Aristotle and Socrates had titles of professors despite the fact they have taught people during centuries...

In order to understand this equation, it is important to note that ability is something immanent to an individual; it is something that comes out of an individual, something that belongs to an individual and is the result of the spirit of an individual. It is something that belongs to the self of an individual!

How something taken from other people, such as knowledge, can be converted in personal ability of an individual? In other words, how can you convert components of education programs and curricula, information from text books and other literature, into individual ability? In my opinion, intensity (speed) of life is this factor of conversion. What is intensity of life? I understand it as devotion to life. Enjoying life and thinking about life! It is approach that human life is the gift of God, which can be extended only through creation. What an individual create in life—it is the measure of his or her individual ability, but also the expression of respecting this gift from God!

Intensity of life is variety of activities and functions that each individual is conducting in a time unit. What is the level of our life intensity, if we sleep 12 hours a day? What is the level of the life intensity of an individual who have never traveled out the place he was born? How intensive is life of a person who communicates with his close family and friends only?³³ What is the level of life intensity of a person who does not accept different life challenges, from life enjoyment to creation?

Intensity of life results in certain level of experience, but it does not have to be the case always. Experience is something that an individual has deeply passed through, something that deeply engraved in his mind, something which is integral part of his mental constitution. Experience is not collection of memories—it is emotional and spiritual driver of a person, new impulses and new ideas, fertile ground for new theories, etc.

Is there something more personal than the experience? Is the experience, acquired through understanding of life, some kind of DNA of human spiritual development and development of his ideas? Why did Einstein say that each theory (idea) was someone's autobiography?

Through intensity of life, each person is acquiring something which belongs to an individual, which is integral part of the self of an individual:

- a. Skills
- b. Competence.

Skills should be understood as a domestication of somebody else's knowledge acquired through education process. This domestication is achieved through development of personal affinities and vocation. Only knowledge which is transformed into skills is efficient, i.e. it increases individualization. Competence is also the result of the intensity of life of an individual. Competence is capacity of an individual to use his/her personal resources, to move something within him/her, to be self-confident and brave... Competence is understood as awaking intellect, emotional, intuitive and creative forces within an individual!

If the role of intensity of life in creating the abilities of an individual is so important, why is dominant education system focused on mechanical acquiring knowledge?

I'll finish the discussion in this section with the question—according to equation $S = z \cdot i^2$ what happens if $i = 0$, i.e. an individual have lifeless knowledge.³⁴ Such knowledge is not producing abilities of an individual? Does it mean that there are situations when we do not need knowledge, i.e. $z = 0$? Of course, the answer is no.

From methodological point of view it is important to emphasize this—acquiring knowledge is necessary, but not sufficient element of efficient education system.

INSTEAD OF CONCLUSION: $S = z \cdot i^2$ AS FOUNDATION OF NEW EDUCATION PARADIGM³⁵

Permanent focus on the relation between knowledge and ability of an individual (student) is the essence of idea of transformation of current education system. The goal of new education system should be knowledge in function of developing individual abilities, i.e. abilities of an individual based on knowledge. This approach is abandoning the thesis that the amount of knowledge—collected information in the head of students increases student ability and creativity. Speaking from the perspective of the education equation

³³Maybe a mobile phone can be indirect indicator of the intensity of your life. At the end of week check how many phone calls you have with same people... Many will be surprised by the fact they live in closed circle.

³⁴Following Einstein's equation $E = mc^2$, it is the question—what is the level of energy of a car which is parked.

³⁵Example of an attempt to implement concept $S = z \cdot i^2$? at University UDG in Podgorica is given below.

presented earlier, current education model put emphasis on variable 'z'. However focus is moving in the direction of 'i'. In other words, it is necessary to adjust and harmonize activities from area of 'z' and 'i,' in educational practice in systematic and holistic way.³⁶

What should be the focus of 'z,' in order to enhance 'i'?

- a. Longitudinal approach in understanding notions and ideas—approach which put emphasis on 'time chain of origin and development' (not everything originate from today and start with us).
- b. Education should not be organized into courses which follow specific disciplines—this organization principle should be replaced with education organized into researching specific problems from the perspective of different sciences, from different angles.
- c. Instead of currently dominant analytical approach, holistic approach must be developed. Holistic approach focuses on entirety and put emphasis on interdependence and relations between integral elements of a whole. In practice it would change the focus of research from statistical facts and events to

processes; from static, absorbing, spongy, to dynamic and creative thinking.

- d. Previous three principles are possible if education system moves from the model whose technologic fundament (way of thinking and understanding society) is steam machine (mass education and education for profession) to the model whose technologic fundament is computer (model of education based on understanding life as a game which emphasize creation.³⁷

What is Important to Develop within Skills and Competences, within i?

I do not want to speak about concrete activities; however i should focus on the following:

- a. Increasing erudite component in the system of education, which include the way we understand the world around us, opening to our own life and life of other people, 'killing cannibal selfishness' in a person.
- b. Enhancing creativity, i.e. ability of each student to produce ideas and understand that ideas are more

Annexure 1: $S = z \cdot i^2$



The basis of studying at UDG

$$S = z \cdot i^2$$

- The curriculum:
 - Authentic
 - Lively
 - The network of interdependence
- Fundamental knowledge
- Research methodology
- International dimension
 - Language
 - Literature
 - Professors
- Entrepreneurially innovative teaching
- Business oriented
- The conditions of implementation:
 - Staff
 - Equipment
 - Space
- Lovcen race (winners get the scholarship) and first class at Lovcen (4th of July-day of freedom)
- Project: ideas and character (6 cycles – 6 semesters: team work, 5-7 students per team)
- Entrepreneurial panel €€€ (hosts business representatives)
- Christmas discussions about economics
- Eⁿ panel (theoretically oriented)
- Research projects within the curriculum (majority of courses)
- Cooperation with companies
- International cooperation and student exchange
- Various extracurricular activities, both within and outside the UDG (dance, folk dance, chorus, drawing...)
- Debate club
- Sport and competitions, the formation of clubs
- Summer schools (Cetinje, Bar, Kotor)
- Winter school of entrepreneurship and innovations
- The garden of ideas ('center of the future')
- Student Business Center (students' earnings)
- The Research Day at UDG (4th of April—The students' day)
- The Market of Entrepreneurial Ideas (9th of May—The day of Europe)
- Entrepreneurial incubator
- Alumni club
- Round tables: Vision and development of the idea of UDG
- Njegos at the heart of UDG
- Exhibitions and movies
- Work with talented students
- Courses regarding the good manners
- Course on communication skills
- Essays

³⁶It is the relation between theory and practice, which is often understood mechanically and as a consequence education level is getting low.

³⁷Dubinu današnje transformacije života i društva izazvane prelaskom sa parne mašine na kompjuter intuitivno možemo najlakše sagledati ukoliko analiziramo procese i posljedice. Transformacije društva u prošlosti-prelaz sa pluga (poljoprivrede) na parnu mašinu (industrija).

important than knowledge. Literature, fine arts, poetry, etc.

- c. Research capacities, i.e. the ability to solve real problems, to explore unknown and uncertain while solving problems.
- d. Entrepreneurial skills, based on the ability to imagine something and make it real in practice.
- e. Communication skills—among other things speaking several languages, where language is understood not only as the mean of communication tool, but also as a mean to understand and respect other cultures, which is of big importance in globalized world..

All of these should be followed by the change in teaching methods, environment where teaching process is conducted and transforming the title of professor into title of coach for life. In a world, today's technical knowledge must be enriched with spirit! Is this possible in the society organized on principles of so-called quantitative democracy and media dictatorship, immanent to it?

'There is salvation, but not for us!' (Albert Camus).

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ABOUT THE AUTHOR

Veselin Vukotic

Professor, Rector, University of Donja Gorica (UDG), Podgorica Montenegro; Institute for Strategic Studies and Prognoses, Podgorica Montenegro; Institute of Social Sciences, Belgrade, Serbia, e-mail: vukotic@tcom.me

BIOGRAPHY

Professor Veselin Vukotic is Rector and Founder of University of Donja Gorica—UDG. He is also the Founder and the President of Institute for Strategic Studies and Prognoses—ISSP, Podgorica, first independent economic institute in Montenegro and senior research fellow at the Institute of Social Science in Belgrade, Serbia.

Professor Vukotic is creator of the idea and founder of internationally known and recognized Postgraduate Studies 'Entrepreneurial Economics', which operated at School of Economics of the University of Montenegro 1992-2007 and continued working within UDG. He is also the President of the Board of directors of vine company 'Plantaze'—one of the best companies in Montenegro and the president of Society of Economists and Managers of Montenegro.

As one of the creators of first law on privatization in SFRY (Socialistic Federative Republic of Yugoslavia) he was Minister for privatization in the last Government of SFRY, which started economic reforms in the country in 1989. He is the author of the concept of economic reforms in Montenegro and actively took part in reforming processes in Montenegro.

He was one of the first members of Mont Pelerin Society from Eastern Europe and now he is a member of the Board of Mont Pelerin Society.