***One, I promise, wonderful Besjeda o obrazovanju (Conversation on Education). I met my friend Aleksandar Mastilović recently through another friend who connects good people and positive energy in this way. I have the great pleasure of talking to a person who, perhaps one of the few, has had the opportunity to be a part of different lives: life in the state, life in business, life at the academy, I think this multi-perspective will bring one positive charge to this conversation about education . We will continue to stick to education, and we will try to answer some burning questions that are no longer as burning as I think they stand before us, and we pretend to be crazy as if they don’t exist. Yes, I am talking about technology, and I can't wait to hear the perspective of the respected Aleksandar, but for a start, a warm welcome to the podcast Besjeda.***

Thank you very much for the invitation and the opportunity to talk about certainly one of the most important, if not the most important topic of a society.

***I would like people to hear briefly who Aleksandar is, because I can't make a list. What I do know is that you are a serious researcher, a serious scientist who has materialized all this in his work through various institutions, businesses, and academia. I'd like to hear a little about it, Alexander.***

First of all, I am a telecommunications engineer, a doctoral candidate on topics that are close to the fifth generation of mobile networks, which is being talked about a lot these days for various reasons. The path started - primarily an academic career, many years at the Faculty of Electrical Engineering in Sarajevo, working with students, working in science, then I received a scholarship from Marie Curie, the European Union. It is a prestigious scholarship for scientific research and doctoral studies on one of the development projects related to 5G, which included 12 partners from all over Europe, both academia and faculties, research laboratories and institutes, and industry representatives, who are trying to turn all those results into products. It was easiest for me to join the team in Novi Sad, so I moved to the Faculty of Technical Sciences, because they were part of that consortium that ran the University of Edinburgh for purely logistical reasons, I didn't go anywhere far. But that project allowed me to spend months in Australia, the US, visit some other institutions in Spain, England, etc., to get to know what they do, so I kind of have that academic career and career as a teacher through that road the most built. In addition, it has never been foreign to me to do jobs related to industry and business, we are trying to make solutions that will be applicable in practice.

***You made the first smart city in the Balkans.***

Especially proud, when I returned to BiH, regardless of my current arrangement at work, I participated in a European project, together with the Development Agency City of East Sarajevo, within the funds for sustainable development, we received a grant and did the first fully operational service smart city in East Sarajevo, a pilot project of smart lighting on 20 poles where we managed to use information and communication technologies, sensors, 4G network and data that we collect and analyze, to adjust the lighting so that it does not shine at night when there are no passers-by to follow it. We achieve savings of up to 47% based on knowledge collected data when people are more or less walking.

***You didn't use social media data, did you?***

We did not use data from social networks. We collected our own data, which we gave artificial intelligence algorithms the task of optimizing, so we set some criteria, e.g. that the street should not be dark if there are passers-by, because security is endangered, but that it should not shine to the maximum if there are no people, so we were looking for some mean value and we did it all on precisely collected data.

***I know exactly why I asked you, and we will continue.***

What is also important for me to say, I returned to BiH at the end of 2018. I am currently working as an expert advisor to the Director General of the Communications Regulatory Agency. This is the third link we talked about, it is work for the government, for the government, ie for the Government, through several ambitious projects where BiH successfully completed the story of the introduction of 4G - the fourth generation of mobile telephony, where we were several years behind our neighbors. We have started the procedure of lowering traffic prices with the countries of the Western Balkans, we are moving towards the EU, towards zero roaming, and something that should have happened these days, will of course be a little late due to the overall situation, and that is launching digital terrestrial TV broadcasting. I think it’s going to be one successfully rounded up story, so it’s nice to share both successful and positive stories when we can’t do some great things in this country.

***That's right. Especially from such an important institution for a society. In preparation for this conversation, we talked about why I tried to joke with you, “you collected data from the company. I have one question from the profession right away, and then we will continue about the nonsense of this very phenomenon. Are we going to die from this 5G and is 5G responsible for the corona virus?***

To connect any telecommunication wireless network that is basically of its nature, and people who are close to physics and natural sciences know it, the electromagnetic wave with the virus is scientifically meaningless, it would be epochal to discover the existence of any connection, given that viruses are semi -living structures that do not have any electric or magnetic sign, so their interaction with the electromagnetic field is very questionable, I can not say that it does not exist, but it is not scientifically proven, and therefore the electromagnetic field could not activate as a dormant virus. Simply, that theory is equivalent to the theory that the earth is a flat plate. It may sound harsh, but it’s about that level. From that scientific point of view, no serious discussion can be initiated, because that is practically almost empirically unacceptable. What is important to know is general electromagnetic radiation is something that is a natural phenomenon, something that is present, we make them artificially with the goal of providing wireless communications. Each of us has some kind of wireless network to which we connect our laptops, phones, we go online via it, it is a home WiFi router, we also use bluethoot for many things. Our mobile phones are connected to the mobile network of 1G, 2G, 3G, today of 4G. In that general sense, 5G is not so new and revolutionary and will not change the basic postulates of physics in that sense. To be unreasonably afraid of electromagnetic waves as a whole, I think it is best to say that light is an electromagnetic wave, light means life, because without light there is no photosynthesis, no food chain, and therefore no life on planet Earth.

***I wonder this, Alexander, because we are all witnesses to this: social networks have become a reality, a good portion of people are on them. The Internet as such, you mention it in several interviews, not just the Internet, the whole world is changing fast, much faster than it has changed in history, and some social elements are slowly adapting to it. On social networks, I see every day that people believe in everything and everything, and somehow science is dominantly pushed into the background. What does it take for a society to start valuing science? First of all, we talked about media literacy how important is it, how important is it to teach media literacy today***?

This is a great question and it is on the trail of what this report is intended for. To touch on education in some of its broadest senses. I very often when I talked about education, when I did not talk about technique and technology, I liked to emphasize that I am completely convinced after working 10 years at university, higher education, that skills, those skills, knowledge, abilities, which we we teach our students students, new generations as a whole, do not fully meet the real needs of either the labor market or coping and living in the 21st century. I think that in all the presences of the Internet where you can find any information you need, memorization must not and should not be the most important skill, that we give students a lesson, they learn it, they represent it without going into details, are they really understood or it is the same reproduction memorization of matter, if it is - then it is quickly forgotten, lessons are not learned, the overall effects are nil. I understand the reasons for that, the teachers were not motivated enough, they are probably not even today, but I fully know that these people are very good in their work, but of course the state must create an environment for people in education to be valued, recognized, not to say only paid, because esteem is a somewhat broader context, it encompasses that part as well. If you need specially awarded those who are pioneers in education reform, but at a time when you can find something on the Internet and make children remember the number of inhabitants, or the number of sheep raised in Cambodia, in geography, I personally remember as a student that I had to learn that.

***We all are.***

I think it is meaningless, because it will not be remembered by professionals, doctors of science, economists, macroeconomic analysts if their specialty is not macroeconomics of agriculture, and still possibly dealing with Asian agriculture, and then Cambodia enters that story, if they deal with macroeconomics and trade in the field of steel, probably even these people will not know this information, especially not by heart. On the other hand, we may fail to teach children how to properly use the Internet and devices, what they should be afraid of, what are the modern risks, media literacy is certainly one of the key skills. In the preparations, we talked about the fact that the Regulatory Agency has prepared a special site, a daughter site that deals with media literacy, which is a very interesting and active project in progress, where we try to explain to people how to recognize fake news and separate from the correct ones. go to some internet portal and by see what their imprint is, who the editorial office is, whether the article is signed by the author, whether this author can be contacted with a denial or ask for an interpretation, whether it can be checked whether the journalist is referenced if he refers to the source of that information, etc. and to tell people that if you do not find the source of that information, and something is claimed in the article that is correct ...

***And sometimes they are very dangerous.***

Yes, such things are very dangerous, imagine that I now go out and say that BiH has a state of Internet consumption, ie Internet access of 300%. The first logical question that someone has to ask is what is the source of my data, did I do research within the Regulatory Agency or did I refer to someone else's research, what methods did someone use, what software, hardware, and some other tools were used, that we really have some sense of whether that data is valid, whether it can be verified, whether the person who personally did that measurement can be contacted. This is one harmless fact that I took as an example, but I just want to emphasize that I can't go out in public, here is even our conversation and claim something that I personally am not.

***Yes, it is happening, Alexander, in parallel. Here’s to trying to clarify the situation: I feel like a huge number of teachers so the whole education system doesn’t see that elephant in the room. Generations have come that consume almost every day and we even talk about dual identities, that these children have a real online identity to which they are bound by both emotion and cognition and that what is happening there in the digital world hurts them and affects their lives , but on this other side we don't seem to see it. Does it require firstly a paradigm shift in the way we look at technology, secondly to talk to children about how important it is that this reality of their lives has completely moved into other frameworks that we do not know?***

I will try to draw this answer through a few pictorial examples. I have personally seen with my friends children who have reached the first year, children are just walking, struggling, are unstable on their feet, have not talked yet, especially do not write or read, but use a mobile phone, memorize a locked phone, find an icon On YouTube, they find some cartoon, Peppa Pig or whatever, they watch, I can't even remember which cartoons are current today, they are not our Tom and Jerry, on which we grew up as a generation. They are already in contact with electronic devices, the Internet, practically - that comes as their first acquired skill. I was not able to track whether they walk first and then use the phone or vice versa.

***And there is very little data that speaks to the benefits of technology in the first six months or a year of cognitive development.***

It is a special scientific story, and I say that insufficient research centers in the world have dealt with the impact of technology on man from the sociological, anthropological, ethical, and even legal, to confirm this, if you make a self-driving car powered by artificial intelligence, in in case that car is the culprit for the traffic accident, who is the subject of the appropriate legal process. The creator of the algorithm cannot, because artificial intelligence is changing and evolving, it is no longer his initial algorithm. Who is to blame? And people will look for the culprit about it, especially the family if someone gets hurt in that story. That's one side. What if we encounter humanoid robots, as it will affect our perception of reality, as we see, in recent days, it is shown on the networks, we are afraid of technology. Have we ever thought about fears? I will not talk, I will lower the level to objective fears, which are grounded to some extent, we can discuss why we do not have to be afraid of it, say the fear of losing jobs that robots will replace us - jobs will disappear, it has been happening for hundreds of years, be completely different, and people will always have something to do. There will be jobs, we will no longer use oxen to plow the fields, we will use a tractor, we will not ride horses, but we will drive planes and cars. We will just adjust. And technologies when they came, people ran away like crazy from them, calling them devilish devices. The same story was about the appearance of electricity that will supposedly kill us, because it is a conspiracy theory of Masonic, etc., it is a completely unfounded story and today we see that electricity and all technological advances have brought us to a level where we have never lived better. , that human life expectancy is never longer in history, medicine successfully fights most diseases, we have practically remembered all of them on the fingers of one hand for which we have no cure, practically cancer, HIV, etc. because they are easy to remember, because there are few left. You used to die and you didn't need any diseases, births were risky. We have solved many things: smallpox, plague, not to mention. All of this has enabled our progress and education. I will just not forget for a moment - the only university that is serious Stanford, who practically initiated the entire field of study, is completely interdisciplinary, who connects engineering and modern progress with the social sciences: anthropology, psychology and sociology, because it is about the need to the mental health of people who encounter something unknown is preserved and a natural human emotion that is fear appears.

***Aleksander, you started, not of your own free will, but because people asked you to do so, one special week and you called it "The New Paradigm of Living in the 21st Century". First of all, there is a keyword called privacy. I would like to receive from you some perspective or message that would go to the teachers. These days, what comes to my mind is that they have many cases in which children's recordings are abused, etc. At the same time, we are all helpless, no one knows who to turn to, who is in charge of it, whether it has been legally resolved. I will give you three key words, that is: keywords on the Internet for children and adults, that concept of privacy and the concept of connection with education.***

A natural continuation of my answer to the previous question. Definitely a formal education system, we really need to find ways for children to have a subject that will be not only media literacy, but also digital literacy, that is, to teach them how to behave and prevent dangerous situations. There are many cases when pedophiles contacted children, tried to collect photos from them, and they entrusted this story to much older people who are superior in that position, we cannot count on formal protections, e.g. Facebook says that it is forbidden to use Facebook until the age of 16, a 10-year-old child comes, registers, logs in, changes his age. Facebook has not yet started asking everyone for an ID card to allow you to open this account. How this will be legally regulated in the future, I do not know, but this system is very easy to deceive. We must prepare children so that if they enter that space that is not for them, that they protect themselves to the maximum in that space. We have to explain to them how to recognize fake news, what we talked about, we have to show them how to find what they need. It is one skill that is necessary. There is a series called "Technologies 8" which "5G and new technologies, privacy - new paradigms of living in the 21st century" was practically the title of yesterday's show. Why I said "new paradigms of living": we are entering a world in which we are constantly observed, observed, whether from some not only cameras, formally, physically, but from some sensors, you can be observed anonymously. A bus counter will be set up where the number of passengers will increase by one when you enter. He will not say who the passenger is, but the number will be followed, because we want to know how many buses we need to have so that people can sit comfortably, etc. if we see that they are empty to send them to the parking lot, to organize their routes, to achieve savings, it's all something we need to explain to people why we need internet, why we need 5G, why we need artificial intelligence, that people know from an early age that these are normal notions that bring benefits, with the proviso that we have to work on one at a time, to say my colleagues are to blame and I think I am personally responsible as part of that community, we have denied people the right to be informed. We worked on a lot of advanced things, and we failed to tell it in the media. Not only here but all over the world. People in America don't know what 5G is, and they are very worried, and there may have been the fiercest development of general modern technologies along with China, but they didn't explain to ordinary people what it was about. In that way, we may have contributed to someone else filling that media space and placing incorrect news. The education system can certainly help people to master some basic information and to convey that information so that it reaches everyone who needs or is interested in that information, that we offer to give those answers, that we overcome fear with knowledge. There is no progress of a society without a strong education, because education is the foundation of quality staff, and further industrialization, you have money from strong industrialization, taxes are collected and then you invest again in education, again in health, it is a closed circle. Creating added value, creative work and activity in that approach are the skills of the 21st century that in one society, in one community enable them to be competitive in global markets, and it all starts with work habits, from those first contacts with science. Children can't and shouldn't hate math, they have to love it, it's up to the teacher, of course not everyone is equally talented, we don't even have to force it, there's something called the middle criterion, what we all need to know for a solid grade, and then every teacher will recognize two math talents in class, maybe three.

***In the Law, Aleksandar, stands one wonderful sentence that says: "The goal of education is for every child to reach the maximum of their capacities", no matter who they are. One nostradamus question: will, the link between technology and education in the future:***

1. ***is technology the future of education,***
2. ***does that mean that teachers are no more and there is no need for them anymore?***

I absolutely disagree with that fact. Technology is something I was trying to say a while ago so somehow I lost that thought, first of all we need to understand technology. I will quote the world-famous cyber security expert Jiri Schneider, who said at a conference: "If you people think that technology can solve all your problems," he explained cyber security and mechanisms, but technology in general, "technology in particular," if you think it can solve all your problems, then you have not understood what problems you have, or what technology is in essence. ”Technology is a tool in our hands. I like to compare technology as a hammer that a man will always hold in his hand, and he can take and make furniture with a hammer, make a log cabin, a house, a hut, build something, and use that tool for a good cause. In addition, if he is careless, he can use this tool to injure himself and hit himself on the fingers. It doesn't have to be a big injury, but in the worst case, it can be used as a weapon to seriously injure someone and even kill them. The same with technology, the same with 5G and anything, but let's go back to the story that everything that happens is still at the center of the story - man. Technology will never replace a good teacher, a teacher in general, it can be a tool, to help us transfer knowledge more easily, to remind us of last lesson from last week, if we recorded it, but for the teacher to use that video as a reminder not to talk again or that children can learn more easily not only from a book, but that they have recorded lectures from their teacher. The teacher should not reproduce the content by reading the content of the textbook that the children can see on their own, but by practically giving them some interesting story contexts that the children will remember a story about.

***To lead them on that adventure. You know what I asked you this, Aleksandar? For one simple reason, our mantra and philosophy is of course that technology without a teacher, that the teacher is the one who gives it meaning. Why did I ask you this? Because when we talk about education reforms, our whole narrative comes down to the fact that our schools are technically unequipped that we need to invest in technology that is supposed to save us. For that reason alone, I wanted us to deconstruct this. And thank you! Thank you for that answer. Maybe for the end of this Sermon of ours, I would like to hear some message that is aimed at teachers, especially in the period of this online school in which we all somehow manage.***

First of all, I would like to congratulate the teachers, generally people who work in the education system, who have proven to be very skilled to maintain one of the most important processes in a society so that entire generations do not suffer and their education in this state of emergency. We all have online platforms, here through Zoom or some other, where teachers have the opportunity to talk to their students, and universities have adapted there, and higher education, indeed that process is taking place. The quality of that process can never replace a classroom teacher, but now teachers who have been skeptical of technology have realized that technology can help. The truth is halfway, which means that technology should be slowly introduced into classrooms, and it does not mean that teachers should be informed from it. The ideal situation is when the teacher and technology are together there, not having to write novels of texts, if some things we can record audio. Exams can be done on an electronic platform where some things can be reviewed immediately, at least the final results can be reviewed immediately. The teacher can do the intervention in the way it is reached, one combined effect can be made. I understand why there was a lot of talk about the failure of our schools, there really is a school that does not even have a webcam that we use today, which costs 100-200KM, and it is quality. They don’t have a single projector in that school where a more serious lecture could be made. Really, not to mention some lego systems, or anything that could be learning through play for students. However, we should never forget that investing in technology is meaningless if it is not accompanied by investing in a teacher in the one around whom the educational process revolves, and of course in those facilities where they all live together, I had the opportunity to enter schools that were built in the '60s of the last century and nothing has been done in them since then. Toilets are neglected, windows are leaking in winter, people are sitting in jackets…

***Still in three rows of benches.***

We don't need a projector in that situation, we have to start from the essence, and talk about some overall goal - we need good educational facilities, we need good teachers who, since outside, who are motivated, valued in society for the work they do and, of course, we need new equipment, because we want the educational process to be better and of better quality every year than it was a year earlier, not to mention a decade earlier. It’s one image we strive for, it’s one positive story. I said in the introduction that I am fully convinced that we can do it, we cannot do it quickly but it would be very good to talk about this same topic in two or three years, and talk about what has changed since our first conversation. If we then had the material for 15-20 minutes to talk about it, then we could say that we have done a good job in the field of education.

***I can't finish this, Aleksandar, without saying how happy and proud I am. You are someone who has returned from the US to contribute there. In a preparatory interview, you told me it was like giving something back to the community. What would you say to all those who are the most valuable in this society, really have something to offer, from profession to thought, what is your message to them and all our peers who are in the white world and in BiH, and have not harnessed their capacities?***

There are already certain communities, foundations, systems that are trying to gather everything that is valid in our diaspora and abroad, there are some activities that are more or less visible to our community and these things are improving. I came back for subjective and objective reasons. Objectively, I wanted to participate in projects at the Regulatory Agency when I was invited to come back, because it sounded to me that it was something that matched my ambitions, my career.

***And you have nothing to do with politics?***

No, I came here, basically, mostly as an expert. And to say, I put myself at the disposal of a comprehensive policy in BiH to respond to this challenge from the profession, of course, the policy had to support it to some extent, because I could not do my job differently. I am not the primary decision maker in that whole system, but I have received support, even quite broad in what I do. Further, which is very important to say, that subjective side of the story appeared, I didn't spend much time in America, 2-3 months, I was primarily on that project in Novi Sad at the Faculty of Technical Sciences, but I also spent 2-3 months in Australia , and in America, I saw there that I can build a story because you have a lot of interlocutors, the whole community supports you in that progress. As strong as the competition in these highly developed countries is, you can be more easily achieved than somewhere where people practically don't understand you. It was a bit about spite, and the desire to show that something can be done here in this community, so we talked about that smart city project, etc. I know that I can make it in New York, there are enough of us who could make it whole now ...

***But I want to make it here in East Sarajevo.***

But I want to make it somewhere here, here is a project that was stopped by the corona virus and in the city of Sarajevo to make the same system. It was initiated by UNDP. Realization is currently stalled due to the emergency situation, but I hope that we will raise it soon, and of course in other cities in BiH and throughout the region to show that good stories can generally be told in this area. It is very important to convince people that we can restore positive energy and enthusiasm, to restore faith in us. Not to think that a Made in BiH product is necessarily of poorer quality than some other, to give a chance, if we are dissatisfied to criticize the manufacturer, he will solve it easier, we may hurt the ego, but we will give him a chance to improve and survive, than to stop buying. Criticism does not have to be bad, the ego must not be the leader of the story, our goal must be to achieve a level of development close to EU countries, it is our overall commitment as a society we will turn in that direction, and no sector there from education to health, it should not set any other goal than to reach at least the average level of the EU in that sense. I'm talking about a project that is more than a decade old, it will take us 20-30 years for that journey, but small steps mean it. If after a year we see an improvement in that direction, we can be happy. We really have to leave at least 10% to ourselves and get rid of that selfishness, to be ready to give to this society if we want to leave something new to new generations.

***In that name, we invest in education and the path of 1000 steps starts with only one. Alexander, I am very grateful for this, first of all, I think you are a model for all young people, young researchers, who despite, and in spite of, I encourage them from the bottom of my heart, so I am one of them, to continue, to try to return as much as possible to a community that once did not give, but I am immensely grateful to you and all your projects. Once again, a big greeting from the Community of Innovative Teachers and thank you for this talk.***

Thank you for the opportunity to address you. All the best.