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EXCLUSIVE INTERVIEW

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Interview with Joao Carlos Roque

by Fanni Németh & Marat Awdaljan

Meeting a visionary in person is always a special feeling. As Joao describes his goals, you can see a better, more exciting future right in front of you. There were always challenges on his path, but he gave them meaning and aimed to overcome them to get the best possible results.

Inspiring interview with a remarkable person – thank you, Joao!

Start of career

Can you tell us who *"JOAO CARLOS ROQUE is"*?

I am a dental technician, first of all. I graduated back in the '90s. Since the beginning of my career, I had the possibility to become a teacher of my profession. When I look back, I believe this opportunity changed my life because, before that, I wanted to become a pilot, which is completely different from being a professor and teaching.

When I was young, I had to undergo orthodontic treatment and this is how I discovered the world of dentistry. I spent many hours at the dentist and had the opportunity to visit a dental laboratory. Later, the dentist of a friend of mine mentioned the opening of a new dental technology school in Lisbon. I and my friend applied to enroll at school. I was selected, and he wasn't. I followed the dental pathway and he enrolled in Business Administration becoming later the owner of my cousin's glass factory. I recently was the teacher of his daughter, who also became a dental technician. Life is funny.

Dental technology school had just started in Portugal with the support of the Hope Foundation from the USA and I knew that a grant program existed for students to become future teachers at the school of dentistry. I applied after completing my dental technology program and went to Michigan - USA to complete a bachelor's degree in Allied Health Education. It was a great opportunity for my academic career and also a preparation for life.

After two years spent in the USA, I came back to Portugal and joined six other colleagues already teaching at the school, after completing identical programs. Although we all had a specific area of interest, in the first years of teaching we did a rotation on teaching different disciplines (Morphology, Total, Removable, Fixed, Orthodontics) which gave us a lot of knowledge and integrated experience of all areas of dental technology. I finally settled on the Fixed Prostheses Department.

To complement the teaching activity, I also started working in a laboratory at a dental office. I taught at school in the mornings and then worked in the lab in the afternoon. It was always important for me to show students that ***"we teach what we do"*** and how we handle everyday real cases.

At the same time, I was appointed as the coordinator of an ongoing program aimed at the oldest generation of dental technicians who didn't have academic graduation, as they had started to work before schools existed. It was a weekend program for one and half years to give them the academic background for their laboratory activity. I did it for almost five years and it was the base for my Master's in Education degree, where I studied the influence of the program on the technicians' professional and personal life.

Later on, following my interest in research on my main area of work and teaching, I did my PhD. on Health Sciences and Technology - Dental Technology Area, studying color and light behavior of high-strength ceramic materials.

Currently, I am a Member of the Coordinator Commission of the Dental Technology Program, a Member of the Pedagogy Counsel of the Dental Faculty - University of Lisbon and head of six disciplines of the program, as well as an investigator with PhD students. I´m still working at Nuno Ferreira da Silva laboratory, almost since the beginning of my career.

"I am not just an academic dental technician."

Who were your *"mentors"* on your journey of getting to where you are now?

When I enrolled at the school, I had the chance to be very close to the director, Armando Simões dos Santos, because my best colleague at the course lived at his home. He was a really inspiring person for us. He was a doctor who specialized in dentistry, and worked in a hospital. He saw a lot of patients who had problems with occlusion and articulation. He used to travel to international exhibitions of dental materials along with the old generation of dental technicians and to the Nordic countries to learn more with the masters of occlusion. They saw some schools in Norway with an integrated model of dental education. He brought home the idea and planned to establish a public dental school in Lisbon. At the time, technicians asked him to also implement an academic dental technology program for them to learn more. Years later his little school project was integrated as a faculty at Universidade de Lisboa.

When I came back from the USA to teach at the school, he helped me to get a part-time job at an office of a friend, Dr. Fernando Ferreira, who was the first Odontologist to have a Swiss dental technician working for him doing gold ceramic crowns. He had the top of technology at the time and wanted the future teachers of the school to be as well-prepared as possible. He invited me to work in an integrated approach at a dental laboratory inside a dental office, with the opportunity to see my works in patients' mouths and learn from it. Dr. Santos did the same at his dental office too. They were quite an inspiration for me: Dr. Santos for his idea of an integrated model of dental school, joining all the professionals involved in the dental team; Dr. Ferreira for having lunch together with all of his team of dentists and technicians weekly, back in the 90s, sharing ideas for solutions on an equal basis, quite inspiring for dental technicians at the time. He worked until he was 90 years old and still used to come to the laboratory to discuss the cases with me until then. Both early understood that dental technicians' education would help make dentists better prosthodontists.

My other mentor is Nuno Ferreira da Silva. I have been working at his laboratory for more than 30 years now, after the initial experience with his cousin Dr. Ferreira for a couple of years. Although I had my job at the university, he opened his lab to me and gave me technical support and introduced me to the industry as well. His laboratory was one of the first to have the PROCERA cad-cam system in Portugal, back in the early 90s, and we both collaborated with Nobel Biocare for long years. Although he is not working anymore due to his health condition, I am still working in his lab. As I always tell him, ***"he supported me in the beginning and I will support him till the end."***

What do you consider the biggest *"achievement"* in your career?

Being the first to accomplish the PhD degree in Dental Technology was a great achievement - not for me personally but as opening a door for the dental technicians of the future. It shows that you can always go higher. You just need to consolidate your body of knowledge and do research. Opening that door assures that we will have dental technology in the position that it should be: on the same level as the academic programs for dentists. What we do is very important for the patients. It has the same importance as what dentists or engineers do.

Now, dental technicians can start to share their inspiring vision for the future and discuss it with the industry with the support of research. It is very important not to leave it only to dentists and engineers. Otherwise, we would only use other ideas and would not strive toward our own visions.

This approach is unique. For the moment, this is the only available PhD program in dental technology. Right now, we have six students enrolled in the PhD program. It takes time, four to five years of effort, but I think this is a huge step for the future of dental technology.

Work/business

What is the main *"idea"* and philosophy of the Lisbon Dental University?

The philosophy behind the faculty is to have a multi-disciplinary approach for the dental team. The faculty has Dental Medicine, Dental Technology and Dental Hygiene programs and also PhD programs in all three areas of study. All are taught in the same building, bringing proximity between all the students, allowing them to be in contact with the patients in the dental clinic and observing and interacting at the dental technicians' laboratories. Synergy also exists between all the programs, with professors from different programs teaching classes in other programs. This allows students to be exposed to different approaches and methodologies and have an integrated overview of the complexity of dental team interaction and workflow. Research is also multi-disciplinary with teams integrating students from different programs.

What are the core values of the Lisbon Dental University?

I personally think that the most important thing in life is to have good people around us. That is about human values. You can be an awesome technician but if you don't have the right values, most probably people will not enjoy working with you. So as long as the technical skills are fine, we also have to work on the social behavioral skills too.

Therefore, in practical classes, we work with groups of twenty students maximum, in the three-year laboratories that are side-by-side. Two teachers work together with the same group of students in each discipline, for 6 to 8 hours each week. Teachers and students share the same space and their experience five days a week for three years, and they become a family. By the end of the program, teachers don't just pass the technical skills but also part of themselves and their personality. Students make their transition to adulthood at the faculty, which is a very important phase in life, very intense and meaningful.

I really believe that if you can inspire them not just with what you do, but also with what you are and what you have done throughout your journey, then you can make them better prepared for the future. Hopefully, when they have their own lab, they become teachers themselves for the team, transferring what they learned.

This is what ***"I try to teach at the university: not just skills but behavior."***

How do you see the future of Lisbon Dental University?

I really think that is promising. Five years ago, we started a transition to implement thirty percent of digital technology in the program study plan. It will be progressive until we reach seventy percent, as we believe we should always keep a space for traditional analogic procedures that will make students understand where the profession came from and what are the basic procedures that inspire the implementation of the digital processes.

Actually, during each semester in all practical disciplines, students execute the same practical projects with conventional and digital technology. The board of teachers complement each other in both technologies.

Along with the traditional laboratory facilities we have four different digital laboratories, with industry key players' partnership (Nobel Biocare; Straumann; Zirkonzahn; 3D Systems; Renfert), for CAD-CAM subtractive and additive technologies.

The digital integration started at the dental technology program and due to the promising results, it is now being transferred also to the dental medicine and dental hygiene programs with the creation of a digital hub of technologies to support classes in all programs and research units as well. The implementation of digital clinical and laboratory fluxes will be part of the routine of teaching for all programs at the institution.

This is how I see the future of dentistry. We tend to move closer to engineering areas because dentistry is using more and more digital equipment and tools, allowing for more precision and reliability. However, working on a computer screen is completely different from working manually because you lose the sense of scale and reference points and also the emotion of the patients. It is essential to acquire these competencies first. Previously, we always had new tools coming to daily practice, and it always helped. CAD/CAM is just another tool – it is better than the others, probably the most powerful we have ever had, but you still need the sense and the heart behind what you do for an individualized patient.

Lisbon Dental University is the first to have a specific PhD program for dental technicians; can you please elaborate on that? (importance etc.)

To be part of a university implies doing research, which is what differentiates the academy from technical or vocational schools. Therefore, for dental technology to stay at the dental faculty, there was no other way than create and implement a PhD program and have teachers progress in their academic careers. The same happened to dental hygiene. Traditionally, these professions were at the technical level and for many decades were only offered at vocational or technical schools worldwide. We can now find them in other universities in Europe, but still without this specific PhD program, which we started in Portugal.

Our model of dental education offers opportunities for integrated research in the area, which can also be potentiated with the engineers' science schools at Universidade de Lisboa.

It is a five-year program. In the first year, students have seminars to help them prepare to present their research projects. It must be presented to a jury before they go for the second year, making sure it is significant and well designed. Students must have a faculty PhD dental technician as a mentor and can also have two other PhD professors from other research areas as co-mentors.

New professors who graduated from the PhD programs will have a very important role in the future. They will be mentors for Master's students in a program that is being designed for approval and in ten years, they all will bring higher recognition to dental technicians and will open new perspectives for dental technology as a core science in the dental field.

What researches is the university focusing on?

The dental faculty traditionally focuses on dental material research. Other strong areas are biology and implantology. But digital technology is emerging as a strong area too.

My research areas are color, ceramic materials and dentist/dental technician communication. These areas are closely related to each other and especially the color is still very underdeveloped. Tooth color determination and communication are finally changing from the conventional empirical process (based on shade guides) to a more precise and quantified process (based on portable/mobile colorimeters and spectrophotometers) that can be more effective on individual color replication. This is a big field for future research.

Currently, 3D printing also gives us many questions to be addressed and my PhD students are working on it. We are working on interconnected research questions.

What is your perspective on teaching?

Teaching is very demanding. It is a job never completed and needs a great dedication to knowledge and to students. If you are not passionate about it, then it is not a job for you, because it is underpaid and not recognized by others.

Teaching at a school is quite different from teaching particular courses on weekends. In the second case, you are a specialist in a subject and you are presenting your point of view to the people who decided to come to see you. For that, you are recognized and well-paid. In the first case, students come from different backgrounds with different personalities at a young age and with personal problems. You need to motivate them, to read their difficulties, to look for different strategies and to make them believe they will be able to perform. It is hard work and they all think you must have the solution, because you are the teacher and should already know about everything. Plus, you have to evaluate and grade them, and they are all so different in skills and talent. But after three years of close contact, it is amazing to look back at the journey each of them accomplished. We can see how grateful they are for the help they were given. It is best to have them as friends for life, and they look for your advice for the rest of their lives.

The most difficult thing is to make good choices for the contents of the courses, to decide what should be taught at a basic entry level and what is essential in a professional context or at a postgraduate program or course to form specialists. When evaluating programs and teachers, people mix up these two concepts and most often forget their own professional start.

Do you have tips/tricks for teachers about how to become better teachers?

I think that the most difficult thing a teacher has to face is that s/he is surrounded by a group of students who are all completely different. They all have different needs and we need to be able to read them, to map their necessities. Some may need help in the technical field while others will need help in behavior or even confidence in themselves.

During my teaching years, I experienced that if a student is great in technical skills, s/he is (most probably) very competitive. It is very important to give a balance while becoming the best, not losing humility and the capacity to help others.

I also see that students who lack hand skills, tend to be more frustrated in classes and lack confidence. You need to work closer, to reinforce positively to give confidence.

With the introduction of the digital into the curriculum, it is becoming clear to me that students are divided into two different groups. Our internal research on this question is showing it. One group is clearly straggling in front of a computer screen because they don't like it and they prefer to work by hand, they have an artistic mindset. The others love technology and are driven by fast achievement, they have a scientific mindset. Although we try to make them perform equally in both areas, they always have a preference and try to move away from the area of discomfort. So, I think the curriculum should be divided into two different areas of expertise in the final year of the program and make them experience more in their main focus area. This will guide them to perform better in the future, give them a path to follow and fulfill their career.

Also, you ***"need to have patience from within."*** If you miss it, life as a teacher is much harder. Sometimes teachers are aggressive in passing knowledge or in their interpersonal relations and they lose a student. For me, ***"losing a student is the worst thing"*** that can happen. I rather struggle more to make them realize that they have a future in the profession and to show them how to utilize their skills.

Teachers should know what career opportunities exist in the field and guide students on the base of their intrinsic capacities. There are a lot of work opportunities, at the bench, in the digital field, in the commercial area, or doing research, you must guide them to the best of their abilities.

At Universidade de Lisboa we have some programs aimed at teachers. One is a semester program named "Teach and Learn". It consists of attending other colleagues' classes and having feedback from your own classes on a group of four participants from different schools of the university. We learn a lot from it. The other is a one-year postgraduate program aimed at graduates who would like to become teachers. They are assigned to a discipline and help the professors with planning, delivering and evaluating class activities while they are preparing an individual educational project. It is very good training that can make them realize if teaching is really what they want to do as a profession.

What are your strategies to maintain effective communication in teaching?

Closeness to students is key for communication. Be assertive in your messages and don't overload students with information. Always try to make students look up the information they need, guiding them through what is available.

I always tell students that we just help them open some windows. Like in software, it's impossible to open them all and experience them together, so they must keep doing it after leaving school.

What are the qualities a leader must have to manage a team successfully?

Being a listener! Being able to plan ahead! Balancing collaborators' capacities! Finally, being able to share the good or bad achievements of the team.

What are the biggest lessons that you have learned in your career as a teacher?

First, realize that all you know is never enough. As the more you know, the less you get to know. Every day you are confronted with new doubts that make you feel very ignorant after all you have already learned.

Secondly, you should never give up on a student. Everyone can surprise you in a way you would never think. You just have to make them believe in their own capacity.

What is/are the biggest need(s) in dentistry/ dental technology at the moment?

It is essential not to lose the sense that we are dealing with patients and that they are unique individuals. If we get lost in technology and fast and cheap production of restorations, we won't be able to fulfil the patient's needs, especially in aesthetic rehabilitation.

What is your perspective on innovation?

Innovation is very important, but it needs to be reliable and for that, research is needed and time too. For decades we have been introduced to a lot of materials and equipment that were the best ever achieved but didn't pass the test of time and are now out of the market. Companies are commercially aggressive, we spend a lot of money and do a lot of testing for them for free. Sometimes patients use materials that only passed "in vitro tests" instead of "in vivo tests". When something goes wrong, there is always an excuse.

We need to be aware of new approaches and go slower of fast assumptions on the innovations.

What do you think about the growing importance of "*digital dentistry vs the manual working*" processes? And how do you see the future of dentistry?

Digital dentistry is growing fast, at a pace faster than what we have ever experienced before. It is hard to keep track of so many innovative digital tools. I think Artificial Intelligence (AI) is very interesting and it helps us to mimic nature in a much better way and it will have a strong impact on our daily work decisions. The manual processes will diminish and will be specific for areas where technology still isn't able to create certain details, like intrinsic color or surface characteristics. Although we will have more interaction with digital technology, some are still very expensive and not available for all markets. The growing demand for digital technology is creating difficulties in access to computer parts and it may slow the process. Developing countries have labor costs that may still favor the manual process. So, I see a very asymmetric development and access to technology and this will make the difference.

I believe that the biggest challenge remains keeping the balance for a machine-made restoration which has handmade individualized characteristics, the art for one's smile.

How do you manage your time and focus on so many ongoing projects?

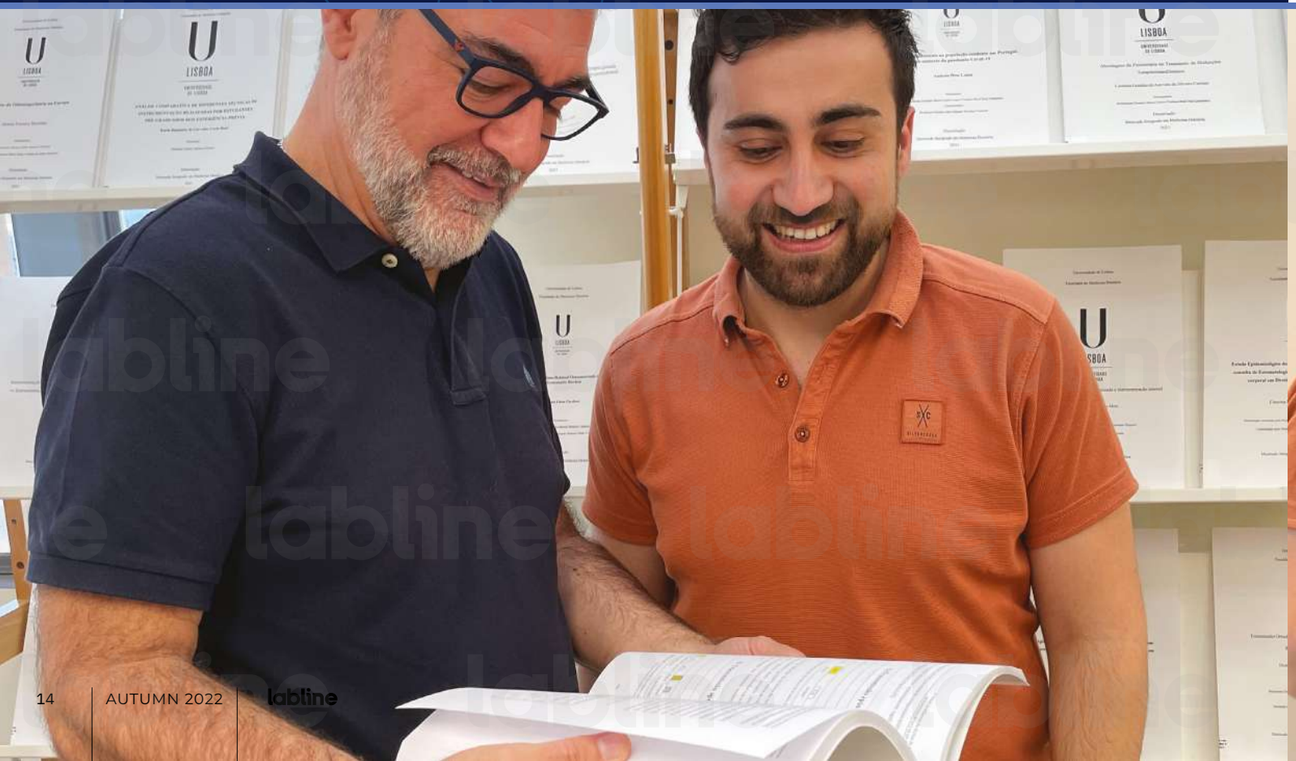
I have to be very organized. If we are organized, we can fit into a timescale. I actually divide my day into three parts.

In the mornings I am at the university. I have classes and also have a bunch of paperwork to be done from the different commissions I take part in. It is very demanding especially when I have simultaneously ongoing research projects. My assistant professors' help is indispensable.

In the afternoon I spend my time in the laboratory. Every day I check the new cases. Works go through my bench, where I check the margins and how the work should progress. Before I start layering ceramic (what I really enjoy doing) I support the others to make decisions about cases. I have a continuous follow-up but not strict control of my colleagues.

For the evening, I still have some reading and preparation for classes.

My daily routine is very demanding, but "***if you love what you do, and you are passionate about it, it is never overwhelming.***"



Philosophy/personal

Do you have any daily rituals? (Morning rituals/ success rituals)

Not really, apart from talking to my children at the end of the day before I go to rest.

What do you consider the biggest "*lessons*" in your life?

There is always a solution when you face the biggest problem. When a door closes, remember that another one will open for you.

Living in Europe now, with the war and all the challenges we face, makes us realize that suddenly everything can change in our life. We never have control of the unexpected. So, "***stay positive and have faith in the future.***"

Don't question yourself and your life too much, enjoy every moment with the best it offers you at the moment.

What do you like to do in your "*free time*"? Do you have any hobbies?

I did a lot of different sports when I was younger. Now I just try to keep fit by cycling around the city. Sit at a coffee shop, in a garden or by the sea with a book and enjoy my time. I also like to observe and see people's behavior and their interactions. I love photography too, because each photo can have a million personal images in it.

What is your ultimate "*vision in life*"?

Accept what life brings you and learn from it. There is always something good to be highlighted at any moment. You just need to appreciate the beauty of the small things and details that surround you.

Always look at others with an open heart. Try to bring up the best in each person you meet.

Stay positive, think positively of the challenges you face and make the best out of them.

What are your "*goals*" in life?

I would like to retire from the University in 10-15 years assuring that what we built will progress for another 30 or more years on. Since I joined the teaching board of the school, I have always thought of what my legacy will be. Once I retire, I want to leave something behind as Mr. Santos did to my generation.

I want my children to be proud of their father's journey and have me as a lighthouse to guide them through their life, being happy as I have been, doing what they love the best.

I want to have a bit calmer life in my later years.

What is the best advice you ever gotten and followed?

"***Do your best every day", I learned from my parents.***"

When I teach my students, I always ask them if the prostheses they have made are good enough for their parents. They need to keep that in mind, and if so, they will not disappoint anybody.

What is your perception of failure?

No problem, you just have to try again and learn from your mistake. It will be better the next time and you will be stronger.

Conclusion

If you had the opportunity to "*do this all again*", what would you do differently in your life?

I would do everything the same.

I feel very fortunate because life gave me very good things.

Even when I thought "this is bad", that situation gave me positive feelings. It showed me new ways, it made me a better person.

And now, I am surrounded by very good people, I teach what I love.

I am happy and that is the best that could have happened to me...

So, I would not change anything.

If this was your last day on earth what would you like to share with the world?

"*BE KIND TO OTHERS*"

If you are kind to others, they will not harm you. You will feel better about yourself, so you give yourself a favor.

Photo Legends

[Figs. 1 and 2] **Mentors, Dr. Fernando Ferreira and technician Nuno Ferreira da Silva.**

[Figs. 3 and 4] **Working at lab and with the lab team.**

[Fig. 5] **Practical class with postgraduation students.**


[Fig. 1]


[Fig. 2]


[Fig. 3]


[Fig. 4]


[Fig. 5]


[Fig. 6]


[Fig. 7]


[Fig. 8]


[Fig. 9]


[Fig. 10]

[Fig. 6] **Giving instruction to graduation finalists applying to Zirkonzahn Military School**

[Figs. 7 and 8] **At research laboratory with students.**

[Fig. 9] **Academic activities planning with Dental Morphology department assistants**

[Fig. 10] **Chilling out with Fixed Prostheses Department assistants.**

Prof. Joao Carlos Roque

Experience

January 1990 – Present
University of Lisbon
Faculty of Dentistry Lisbon, Portugal
Position: Auxiliary Professor
Head of the Fixed Prosthetics Department of the Dental Technology Program. Member of the Coordination Commission of the Dental Technology Program. Member of the Faculty Pedagogy Commission.

1992 – Present
Technical Coordinator
Nuno Ferreira da Silva, Lda.
Technical orientation of staff in fixed dental prosthesis fabrication

1996 – Present
Founder of Portuguese Dental Technicians Association (APTPD), Former President of Direction, of General Assembly and Congress

2002 – 2016
Technical adviser for Dental Technology area
Nobel Biocare Portugal

2002 – Present
Member of the dental technology comission on the National Health Department

Education

2010 – 2015
Faculdade de Medicina Dentária - Universidade de Lisboa
PhD on Health Sciences - Dental Technology Area

2003 – 2005
Faculdade de Psicologia e Ciências da Educação - Universidade de Lisboa
Master of Education - Higher Education Pedagogy

1990 – 1992
Ferris State University, Michigan - USA
Bachelor in Science Education - Allied Health Education

1985 – 1987
Faculdade de Medicina Dentária - Universidade de Lisboa
Bachelor - Dental Technology

Marat Awdaljan

Marat Awdaljan is a dental ceramist born in Tbilisi, Georgia, in 1988 to Armenian parents. In 1993, his family moved to the Netherlands, where he grew up. While completing his training at the Dental Technology school in 2010, he received the best thesis award for his thesis on psychology in dental technology, entitled “Key to the future”.

At the age of 21, he was given the title of Master Dental Technician and started working at the dental laboratory “Natuurlijk! Tandtechniek” in Veenendaal. In 2012 he accomplished his training as a Clinical Dental Technician, and one year later he became the manager and co-owner of the laboratory where he remained until 2020.

During this period Marat was also traveling worldwide to meet the Masters in Dentistry in order to find answers to all the questions and problems in the dental field. Interviews with the Masters are published in Labline Magazine. In 2019 Marat created MATISSE, the shade matching software for dentists and dental technicians. As Matisse progresses, Marat gives lectures and live-patient courses worldwide.