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# Unemployed Biotechnology Graduates: Need of Modernization of Education and Training in Tunisia

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## Abstract

Biotechnology is a priority higher education and economical sector for Tunisia. However, there is an ever-increasing unemployment rate of the biotechnology graduates in the country. Indeed, this huge problem warrants immediate attention and necessary actions from various stakeholders. This study presents the results of a benchmarking visit, which was arranged by Tampere University of Applied Sciences (TAMK) in Finland, as part of 'BiotechTunisia' Erasmus+ project entitled 'Modernization of Biotechnology training for better employability of graduates in Tunisia'. There are four Tunisian and three European partners in this project that leads to modernization of skills of teachers, researchers, and students to improve employment and opportunities for entrepreneurship of young graduates in Tunisia. The project aims to modernize the education and the scientific research in the biotechnology field. During this benchmarking visit, Tunisian partners attended seminars, workshops, visited advanced learning facilities, participated to many group discussions, learned about teacher tutoring concept, and student counselling method. Delegation learned about new learning methodologies, pedagogy, and soft skills of students, which could be replicated in their home country education system. The benchmarking visit is seen as an opportunity for Tunisian partners to transfer the good practices from Finland to their home country. Tunisian delegates agree that the learnings could have a positive impact in their education system in coming years towards modernization of education and training of biotechnology students.

**Keywords:** biotechnology, Tunisia, benchmarking, education, employment

## 1. Modernization and educational reforms

Educational reforms have achieved much success globally in terms of improving desired individual growth and larger societal benefits in addition to education quality and accessibility (Elsenberger & Kendzia, 2023). Studies show that such initiatives have direct

impact on market and non-market factors. A basic taxonomy of educational benefits proposed by Münich and Psacharopoulos (2018) illustrates that prominent benefits include improved employability; an increased labor market; less unemployment and possible higher earnings for people. The consequence of which results in for example higher productivity and lesser reliance on government financial support. Similarly, Biavaschi et al. (2012) made several relevant propositions regarding the role of training and education on the labor market situation and the transition of young people into working life in developing countries. Authors highlight that provision of better training of young people is a core issue for many such developing countries, which need to open up to new technologies and occupational changes.

In general, the youth unemployment or transition into work in labor market can be explained by few main factors including demography and labor demand in a country's economy. However, the contribution of training and education cannot be neglected. There is higher probability for better education young graduates to land into gainful employment and better working life. It can be said that modern training brings young graduates closer to the labor market and helps into a smooth transition into the work and employment. Hence, the situation warrants a rigorous evaluation of certain professional trainings and need of educational reform. A study (Böckerman et al., 2009) conducted in Finland focusing on the universities of applied sciences highlights that the desired results of an education reform in terms of better employment of graduates and monthly earnings may possibly appear when such reform is gradually rolled out in several steps.

The influence of technology in professional education has been increasing at a considerable rate to teach young professionals. Modernization of education has been supported by several theoretical foundations and useful models, which suggest that modernization of curriculum must be part of such overall change process. According to Sadiq (2005), learners must be equipped with innovation and technology as part of a modern well-designed curriculum. The dynamics of education as panacea to all human problems has always given impetus to curriculum review in any society. In so doing, curriculum planners must make an effort to study the activities people engage in and design the kind of curriculum that helps them to carry out these activities more efficiently. They should be concerned with those things that are useful and relevant to the society including general needs of all learners' interests (Sadiq, 2005).

The European Expert Network on Economics of Education (EENEE) in collaboration with the University of Munich and the University of Cambridge prepared a detailed and extensive analytical report for the European Commission (EC), which states that unemployment of young people is influenced by the country's prevailing national educational system that is; if students are disconnected with labor market; there would be severe unemployment problems in the country (Piopiunik & Ryan, 2012).

## **2. A brief look at the unemployment situation in Tunisia**

Tunisia is a country with a population of about 12,3 million people with an average 78% literacy rate, where around 31% of young adults could study at a university or a higher education institute. There is around 15% of unemployment rate in Tunisia, which can be further divided into 35% for those of age 15 to 24 and around 42% for those with a tertiary education (Flayols et al., 2019). Similarly, according to Mansuy & Werquin (2015), even those who would attend universities are particularly at a high risk of unemployment once they graduate in Tunisia. Authors posit that this could be due to lack of formal trainings during their studies. It is stated that modern education and training that match the labor market are

not common in Tunisia. Statistics show that only around 52% of young graduates are employed with social security and around 82% are employed with a written contract.

Other factors, which are considered determinants of working life, and that influence unemployment of young graduates include gender, marital status as well as location in the country. A recent study by Assaad & Krafft (2023) propose that both Tunisian men and women would experience unemployment in coming future. This situation represents a poor and bleak prospect for young Tunisians with higher education and technical university degrees that they would face difficulties in finding suitable permanent employment in labor market, which in turns develop sense of dissatisfaction among graduates (Flayols et al., 2019).

Similarly, from geographical point of view, employment opportunities for young graduates are not uniformly in different regions of Tunisia. The chance of employment is highly dependent on the region of residence in Tunisia. Mhenni et al. (2013) state that the initiative taken by the Ministry of Higher Education and Scientific Research to establish Technoparks in several different cities of Tunisia gained attraction and attention by huge number of professionals and young graduates belonging to the vast areas of innovation, research, science, technology, and entrepreneurship. However, authors propose that Technoparks would not necessarily show results unless needed prerequisites are established first (Salha, 2013).

Education system in Tunisia has its roots in French educational system. During the 80's decade, Tunisia had some education reforms, which according to its objectives, did improve the access to education however the quality of education could not be improved, which resulted in low employability of young Tunisians (Flayols et al., 2019). Although Tunisians like technical education, however even after graduation from technical universities, the diploma does not guarantee a job in Tunisia that is some 42% of university graduates with advanced education are currently unemployed in Tunisia.

There are around 41% of youth between the ages of 15 to 34 in Tunisian population. It is a matter of great importance and urgency to provide modern education with quality training and skills leading to long-term employability to young graduates for a sustainable Tunisian labor market and economy (Murphy, 2017). At the moment, it seems that there is a mismatch between the quality of education and labor market needs warranting modernization of education and training specially in the field of biotechnology in Tunisia.

### **3. Benchmarking visit of a Finnish university of applied sciences**

This study presents result of a benchmarking visit of a Finnish University of Higher Education as part of an Erasmus project Capacity Building in Higher Education (CBHE) Erasmus+ project namely 'Modernization of Biotechnology training for better employability of graduates in Tunisia' (also called BiotechTunisia). This visit was for a week and several Tunisian delegates including professors, senior researchers and other management personnel participated in it.

During the benchmarking visit, a panel interview session was held with the Tunisian Project Coordinators, Tunisian Senior Member of University Management, and Finnish Project Coordinators. The data for this study come from that interview.

Table 1: Aims and objectives:

<i>Project aims and objectives</i>	<i>Objectives of Benchmarking Visit</i>
Learning capabilities in modern work environments and international networks	Visit to TAMK's campuses & learning environments/labs/platforms
Adaptation of emerging technologies (in teaching and learning)	Peer learning about TAMKs good practices
Sustainable Entrepreneurship and Start-ups	Introduction of entrepreneurship school and its main activities
Collaboration with local municipalities	Introduction of regional-level higher education centers
	Possible meetings with local industry collaborators

## 4. Results & Discussion

The discussion section elaborates the results of the work package mainly related to the benchmarking visit in this project. This section is divided into sub-parts focusing on the various aspects of the study. These parts represent the questions and answers from the panel interview, which took place during the benchmarking visit.

### 4.1 What is this project about? and what was the premise for this project in question and what are you trying and striving to achieve?

This project, 'BiotechTunisia', it's a European project. It's a capacity building into higher education. We are conducting this project with European partners TAMK University from Finland, University of Torino from Italy, and Catholic University of Portugal to resolve some problem regarding our higher education in Tunisia. Biotechnology is a priority for our country, and we are looking for a new methodology and new strategy to resolve our problem. The main problem of our young people is the unemployment. This project started some three years ago but due to pandemic situation, we had some problem of mobility between partners. Now we have resumed, and project will end in 2024. We had visited first Catholic University of Portugal and now we are visiting TAMK University in Finland.

There are several work packages in this project that we are looking for to develop new ideas and to transfer the good practices of your institute as the background of this work package. Like training, research development and innovation, how you are getting your students to develop their competence in entrepreneurship. We think that it's a good opportunity for us. We are very happy to be in the happiest country in the world.

### 4.2 You talked about practices and identifying them during your visit to other European universities and to TAMK. So, what would you say are the main best practices that you have found and identified so far?

So, belonging to the work package training, the first and very important work package in the project. During this benchmarking visit, we attended many seminars here in TAMK university, many visits to advanced learning facilities, many group discussions about how lectures are set up here in TAMK university, the teacher tutoring, the students counselling, how they are teaching students to have an idea about their future projects. We profit from it because we have with us colleagues from my country. The director of the high institute of biotechnology from University of Manouba, which is a good partner in this project with us, and also the international coordinator of this project. So, we have this delegation, and we are meeting many people from TAMK University. They talk with us about the new methodology in pedagogy and also about soft skills of their students.

#### **4.3 Would you then like to share a bit more about what does this project represent for Tunisian universities?**

The 'Bio-tech Tunisia' project is a capacity building project that leads to modernization of skills of teachers, researchers, and students to improve employment and opportunity for entrepreneurship of young graduates in Tunisia. It aims to modernize the education and the scientific research. Because in Tunisia, biotechnology is one of the most important fields that we want to modernize, to start up in Tunisia. The 'Bio-tech Tunisia' is a project that must improve these domains.

Also, if you notice, Tunisia lately got a partnership with many European and other countries. And Tunisia is a very open country for collaboration. We got such a model that it succeeds in one way, but we also have to make it more successful in some other ways also. We think your education system in Finland is known as the most successful system. And we need you to share your experience with us.

So, this project, it represents very good opportunity for Tunisian universities to meet you, to compare where we stand in our country. Also, it was a good opportunity for us, to execute a national project together with other Tunisian university here abroad in Europe. And to know, to share our national experience among us and to compare. I am sure all this week was a very good opportunity for us to give the best to our country when we go back.

#### **4.4 Identifying good practices and exchanging them is, of course, something that these kinds of programs aim to do. But could you tell us a little bit on what you, based on when you said about what has been TAMK's contribution in this program during this week and in this project more generally?**

TAMK as an institution of higher education, is actively involved in several RDI projects within Europe and outside Europe. When TAMK became a European partner in the 'Bio-tech Tunisia' project, we promised to contribute in terms of how student learning is conducted. That is, how the teachers use different methodologies, different pedagogies in their everyday teaching tasks, and also to show that how RDI related activities are promoted in the higher education.

In addition to that, we would also like to show our international delegation that TAMK is connected with the regional actors also, and what takes place within the boundaries of TAMK does not stay inside. We are quite open and take the results to the outside world as well. So, we believe that so far TAMK has been able to contribute to this project very well. And still, we are willing to contribute more in future.

TAMK University contributed a lot to the project. They arranged several online trainings, experiences, many presentations, many seminars, online meetings. TAMK Coordinators participated in project annual consortium meeting in Tunisia. We discussed many activities that we can set up together. We think TAMK University is a principal partner in this project. So, we are now discussing with our Finnish partner to plan many activities in the future and during the last years of the project.

#### **4.5 Could you please tell a little bit about TAMK's R&D contributions to this project, based on your expertise?**

If you think of international projects; this is one of those projects, but it is very special one. And we are expanding our RDI project activities internationally and Europe wide, and that was the main category. And we have tried to expand these activities outside of Europe as well. We see that there is a very specific need where we have a lot to give, not only because,

we are the happiest country, but we normally do not intend to show our expertise. We are a bit shy. We are not like many other countries that are selling their expertise. And we hide it somehow, and for us this kind of a project with the Tunisian partners, and also with international partners in the project, it gave us an opportunity to be an equal member and share the same values that we also want our postdoctoral researchers to be employed, either to be an entrepreneur or to find out some good job to take care, so to say, of their skills and expertise.

But we are struggling ourselves. And the things what we have had a chance to try out is that how the original teaching methodologies can pedagogically move to the coaching and mentoring, which could be the bridge between the researchers and the working life, and the main issue there is the trust. We think that's the same issue within our partners here; that once we get to know each other and have several meetings with each other and we start to trust, then we really can contribute to the project, to the individuals and to the society.

And what helps is that also, like, Tunisia is not a country with hundreds of millions of people, that we have a similar kind of background and in some way or another. And we value expertise, kind of the people within the specific skills and we need to focus on the very niche areas in the global market. Otherwise, we do not generate the welfare for all. And the dialogue is a great tool to really generate trust. Finally, I would point out that, once trust is gained, then the co-creation starts. And that will be the innovative part. I am really looking forward to the next meetings with our Tunisian project delegation and to innovate the new approaches for the future. And with solving the common problems, because it's a problem not only for the Tunisians but it's a global thing.

#### **4.6 Could the lessons learned be applied to other educational fields than biotechnology? And what do you think, will remain the main takeaways from this project in the long run for Tunisia?**

We are looking at many aspects regarding this project. What is deliverable? I think there are three kinds of deliverable activities. So, the first one is in the short term, the second one is the middle terms, and the third one is a long term. For the short term, we need, and we are looking for a training of teachers and researchers belonging to this delegation that are now here in TAMK university. They see experience and they discuss with the staff from TAMK University, and they create ideas to develop the same in their home country. So, this is the objective within the short terms.

In the mid-terms, I think that these people that are visiting and are participating to this benchmarking visit in your country and at your university, they will try to set up in our country, all that they are learning in this university, in foreign university, because there are four universities that are participating in the programs, and they are giving almost the same curriculum.

So, this is very important. We think it's a challenge for them because as you know, it's not very simple to change things rapidly, so this is the challenge for our colleagues and universities in Tunisia to change their manner of teaching, to change their manner of educating our students.

And we hope, and this is the main objective of this project, which is a capacity building project in the long term, that we can set up new practices, new strategies that can resolve our problems of education.

About the research development and innovation, because we have a problem. Certainly, we do have a problem in this area as to bring results, research results from the laboratory to the

working life. And I think with a Finnish partner, we have now actually an opportunity, we have actually an idea, we have actually good practices, and we will discuss when people are returning home. We shall certainly discuss these issues. And I am sure that the impact will be good for our educational systems.

It is like a win-win situation. We are a partner in the project. However, during this benchmarking visit of TAMK, we are also observing the dialogue between the members of the delegation and the TAMK staff, who is involved. And this could open new ways for us to see that what would be the future direction of our institute in terms of building competencies and those competencies, which could be shared with countries that are outside Europe and also with institutes that are quite multidisciplinary. So, this is a win-win situation.

We have a middle term for collaboration or for outputs to see this, to concrete our project in outputs or results. We have a big challenge. Because if we are not here to share, to see and to be convinced with how things are going on, we can't just adapt this system. Because, we have many common problems. We are a small country with a bigger number of young people in Tunisia. Our culture even weather is different, which affects a lot on the mindset. Today, our mindset has changed by what we were sharing with our colleagues from Finland.

We have to change now to adapt this because we know how youth in Tunisia think and we have to make this idea concrete to them and to change something in them because for sure we have a problem in Tunisia. Our bachelor or our, students who have graduated usually they are looking abroad for a good job or to concrete their innovation idea or research ideas or entrepreneurship ideas. And this is not suitable for our economy. At that economic level and development, it starts to be very heavy for our country to continue in this way.

So, changes in long term are also about how to make this generation successful in biotechnology field. To just go ahead in their country with the adapted system and to make better development and begin a successful story for startups in biotechnology sector. So, for us, it is just the start. It is a point of start. But our challenge is still how to make it work.

In the future, there could be an innovation competence center located in Tunisia, maybe somewhere in the northern Africa, which could be like a kind of co-creation platform for good practices and local challenges because we cannot localize anything. And that's kind of the thing we have understood very early that we can't change our society, but we can share good practices. And the local people must see that how those practices could be localized and what we could bring into those competence and innovation centers, we could bring our business collaborations, so we could take in like 30 companies and establish together with them the opportunity for the new kind of labor market or skill market. It could be a great opportunity within the collaboration in the future.

#### **4.7 What is the specialty of this Erasmus project and benchmarking visit of TAMK?**

This Erasmus project is an action-based project. First key action is capacity building in higher education. Here, capacity building is very important. It's a good opportunity for us to be in contact with European countries. In Tunisia, usually we have projects with countries like Italy, France, Spain. So, we think this project is special. The first special thing is that we are collaborating with Nordic people, and they are very nice people. The second thing is that we are using another language, English. We are forcing our people to use this language during the workshops, seminars, and other online trainings. Because we are speaking French as a second language and Arabic as a first language. But people and teachers when they are forced to speak English. It is a good exercise.

And with TAMK University, it's the first project in Erasmus+ in Tunisia and North Africa and this project gives a good opportunity for our lecturers to share experiences with colleagues from TAMK university. I see many new things because I have experience with France, Spain, and Italy. Experiences in research development and training, study training in university.

Within this benchmarking visit this week, it was a very good and very engaging program. There is a social activity because after this meeting together we will go to a summer cottage next to a lake to have an experience of traditional Finnish sauna and grill.

When we think of these two issues, first the training and pedagogy and the second one the research development and innovation. It's the first time that I knew a totally new methodology that they are not traditional methodology that we know in my country. And when we are talking with my colleagues that are participating to this visit, they are very happy to see a new tradition, new methodology, and they are linking and networking with colleagues here in TAMK university, and they are exchanging emails to continue this collaboration for future. Hopefully for us, this project will be the first project, but not the end, not the final project. We are very sure that there are other projects with TAMK University students.

#### **4.8 This week you have been visiting us here at TAMK, is there something that you would be implementing in Tunisia and taking with you as a best practice?**

What we don't have in Tunisia, but we learnt it here is that there is this teacher tutor that guides students from the first year here in the new university to the last year. We don't have this. We think that is a good idea. I think that it's very important to accompany the students, because it's not important to just give information to the students just to give information, but to teach him or her how to give him more skills, how to reach an idea. To prepare, to set up, and to develop those ideas and to think about future projects.

During the first and second days we were just talking about how trust is a very important value here and we feel it. Maybe you are inside, you can't see but we are from outside. We have seen this and even felt it. It's so important, these kinds of values. How to make them more concrete between building a team. It is not only a team. I feel like a family because nobody is outside. Everybody is here. To feel if someone is not good, somehow, they are just trying, to tutor or council among students or teachers.

Even today we have seen that the teacher is not just a coach. And even in the mindset of student, the coach is not teacher. So, the vertical relationship is not vertical anymore. It's just we are together around something; we have to succeed in the education and a good degree. And to make young people more confident and maybe later, a good entrepreneur. This is what we have.

We have very easy communication in Tunisia between us but maybe we don't use it in a good way to make this family ambiance or during studies to have such networking between us. So, this is also, something that we have to learn from TAMK. Maybe you have something to tell us because during these days you have seen discussions. Sometimes it is a little bit like we are maybe looking what is the positive or negative. We need to hear about the feedback from you also.

The project aims to have the results in shorter and longer terms. What I see as the project manager that is coming next, is one of the avenues, where we could further cooperate, is this student counseling issue. So, this is one area where we can give more training to Tunisian teachers. We can provide more information, more scenario building. And then you can take

those scenarios and try to replicate them and apply them on students, who are from the biotechnology field.

This is number one. The other thing I would like to mention is about changing the mindset of the students through building the trust. I am confident that in the long term, this change of mindset and trust building would integrate education and business together in the coming years in Tunisia. Those who are in the positions of decision making would allow universities and institutes of higher education to come closer and that would be a very nice achievement through this project. It takes sometimes, but it will come. This is the main objective.

You have developed the idea that we agree with. Surely, this project will have an impact in our education systems. I am sure about it. I don't know, how many years it may take. But finally, the good impact and the good practice will be restored my country, and we will continue collaboration of course, with TAMK University. We are now planning activities, online trainings like last years, and we will also plan a workshop in Tunisia regarding the famous system, and TAMK's strengths are about the pedagogy and the tutorial.

We were excited before coming here in Finland and always we are excited also to know many other activities in TAMK university and in Finland because it's not only a scientific project, but also, it's a social project. I am sure that you are meeting the first person from Tunisia, me. I'm very happy to meet you also. And there is an environment, where we can improve our capacity, our skills. And it's the same for students in Tunisia.

Tunisian people that are visiting and participating in this benchmarking visit, I'm sure that they will try to develop what they have learned in TAMK, upon in the first day coming in Tunisia and the first course they are doing for their student. And this is a challenge, it's a huge challenge. The impact is beginning from the first day and it takes some time. Finally, hopefully we can arrive at 20%, 50%, 60%. But there are other projects that we will continue with this collaboration and to improve our education systems.

#### **4.9 This project is coming to its end in few months. So, are you planning on continuing with these similar sort of ideas, development projects and issues?**

Sure, this project is the first door for the next collaboration. We met many people here. We met lecturers. We have a lot of contact, we will receive, in the closing meeting of the project, we will receive people from TAMK and discuss between colleagues. And it gives opportunities for new ideas.

I remember the first time I discussed with TAMK university about this collaboration. It was a simple discussion, but these ideas developed, and we have a big project, that's Bio-Tech Tunisia. So, the small idea is like a baby, it grows to be an adult. The cooperation with TAMK University, Biotech Tunisia will be a leader and will be the reason for a future collaboration between Finland and Tunisia.

First of all, this is such a project, which is multidisciplinary. The delegation has been meeting with staff from TAMK's different schools, and it is going to open doors for further cooperation in RDI. We have a very structured procedure and system of cooperation with the partner institutes. So, it would be very easy to have some sort of a scale up of this project in the future. And for that, we need the tools to deliver a kind of trust between the two countries. There are excellent universities and that we show them the true collaboration. And the new project will be built on that, hopefully.

We observed that you people are very serious about this modernization or reform of education, and you mean business. So, it is good to work with people who are really willing and motivated to achieve something for their country. Its larger than all of us.

Your enthusiasm here is visible, so the short-term impact can already be seen. You have loved some of the activities you have tried out yourself, maybe during your time here or you have gotten a kind of a new way of thinking your mindset as you say, that has already been changed a bit and only thing is that how to maintain it, how to disseminate it in your own organization and between the members, decision makers who have not been visiting and seeing the same.

## **5. Conclusion**

The presented project is an Erasmus capacity building in the higher education project called 'Modernization of Biotechnology training for better employability of graduates in Tunisia', where Tunisian and European universities are collaborating to resolve some problem regarding the unemployment of biotechnology graduate students in Tunisia. This project leads mainly to the modernization of skills of teachers, researchers, and students to improve employment and opportunity for entrepreneurship of young graduates in Tunisia. This study presents the results of a benchmarking visit, which was arranged by Tampere University of Applied Sciences (TAMK) as part of this project. Biotechnology is a priority for Tunisia. Tunisian universities are looking for new methodologies and strategies to resolve the problem of the unemployment of graduate students. During this benchmarking visit, the main best practices were found and identified. Tunisian partners attended many seminars, visited advanced learning facilities, participated many group discussions, learned about teacher tutoring concept and student counselling method. Delegation learned also about new learning methods and modern pedagogy and also about soft skills of students.

Tunisia is a very open country for collaboration. The education system in Finland is known as the most successful system, and Tunisian partners intend to learn and share TAMK's best practices and experiences. This project represents for them a very good opportunity to compare where they stand in Tunisia. The benchmarking visit is seen as an opportunity for Tunisian partners to give the best to their country when they go back. There is a very specific need, where TAMK has a lot to give. TAMK contributed in terms of how student learning is conducted. That is, how the teachers use different methodologies, different pedagogies in their everyday teaching tasks, and to show that how RDI related activities are promoted in the higher education. TAMK is connected with the regional actors also, and what takes place within its boundaries does not stay inside. TAMK arranged several online trainings, experiences, many presentations, many seminars, online meetings. Role of training and education has been highlighted in literature (Biavaschi et al., 2012).

Tunisian universities are looking by this project for training of teachers and researchers in biotechnology field. The delegation saw best practices and discussed with TAMK staff to create ideas for developing the same strategies in their home country. They will try to set up all they learnt in 4 Tunisian universities participating in the project because they are giving almost the same curriculum in biotechnology fields. This Erasmus project is an action-based project. It is special because this benchmarking visit is very engaging. It provided opportunities to collaborate with Nordic countries and use another language other than French during the workshops, seminars, and other online trainings. The benchmarking visit was a good opportunity for Tunisian lecturers to share experiences with colleagues from TAMK to learn about teacher tutor that guides students. Further cooperation can be given for student counseling process training to Tunisian teachers. TAMK can provide more information and scenario, which can be replicated for biotechnology students' individual growth in terms of their working life and larger societal benefits (Elsenberger & Kendzia, 2023).

The other main problem in Tunisia is about the research development and innovation related to bringing research results from the laboratory to the working life, which is in line with benefits proposed by Münich and Psacharopoulos (2018). The delegation has been meeting with staff from TAMK RDI department, and it is going to open doors for further cooperation in RDI. It would be very easy to scale up this project in the future and new projects would be built on that. With TAMK, now partners have an opportunity, an idea of good practices that could positively affect their educational systems. However, this is a big challenge because they should just adapt this system in home country. Changes in long term are also about how to make the Tunisian young generation successful in biotechnology field. Having learnt the best practices, the new adapted system would help better development and to begin a successful story for startups in biotechnology sector. For Tunisians, it is just a starting point. However, they think of it as a challenge in terms of how to make it work. In the future, there could be an innovation competence center located in Tunisia, which could be a co-creation platform for good practices to create new kind of labor market or skill market for Tunisian biotechnology graduates.

Finally, Tunisian delegates agree that the learnings from this benchmarking visit would have a big impact in their education systems. It may take many years, but the good impact and the good practice would be restored in Tunisia towards modernization of education and training. It's not only a scientific project, but also a social project. Tunisian people participated in this benchmarking visit would try to develop what they have learnt in TAMK, upon in the first day coming in Tunisia and the first course they would implement for their students. This project is the first door for the next collaboration, and it gives opportunities for new ideas.

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