



Opportunities for Students to Participate in the Program for Obtaining a Second European Diploma in Terms of COVID-19

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Abstract. In the context of the COVID-19 pandemic, the mobility of students and teachers, in particular international mobility, has changed dramatically. Many had to cancel the planned trips abroad, and even trips within the same country became difficult. Moreover, many students and applicants who could be included in the program of international mobility have big doubts and even completely exclude the desire to get acquainted with such opportunities and plan something similar for the future due to uncertainty about the feasibility of such trips. However, life goes on, opportunities gradually return, and given the fact that the process of entering such programs takes a lot of time, it is possible and necessary to join the process now. This article reveals some of the possibilities for international mobility planned for the coming period, including the 2020-2021 academic year and the next 2021-2022 academic year. The authors have long successful experience in organizing international educational mobility of students in the areas of Mechatronics, Automation, Management in Technical Systems, and Smart City Technology and the Internet of Things. International mobility programs affect European universities from Bulgaria, the Czech Republic, Germany, Greece, Latvia, and universities from Mongolia and Kazakhstan also participate in these programs. These programs are funded and funded by the Erasmus + and TEMPUS international foundations, and DAAD support is also possible. For a student, these programs are attractive not only with the opportunity to go to a foreign university, but also with the opportunity to get unique experience of studying at a European university in English or in the language of the state where the university is located, use of infrastructure and advanced technologies and educational equipment, and the opportunity to receive an international diploma, which is accepted without nostrification in all the leading countries of Europe, America, Australia.

Key words: double diploma, automation, smart city, smart home, automation, mechatronics, mobility, computer science, computer technology

INTRODUCTION

The double diploma program, which would more correctly be called the “program for two diplomas during one term of study”, is an excellent opportunity for students. It is easiest to implement within the framework of the master's curriculum, since this is the most universal type of higher education. In various countries, graduate studies (in European countries it is called a master's degree program, which was previously translated into Russian as a “candidate of science”, but this is a mistake), this program lasts from three to four semesters.

The essence of such a program is that a student can take one part of the training at the university of his country, the other (usually equal) part at any foreign university, and eventually receive diplomas from both universities.

Everything in reality is far from so simple, because this requires, firstly, synchronization of training programs, secondly, a legal opportunity for such a procedure, which is given by the conclusion of a number of necessary agreements between these universities, and thirdly, the necessary funding for travel and accommodation fourthly, knowledge of the language in which teaching will be conducted, fifthly, undergoing the selection procedure for applicants, sixthly, drawing up the necessary

documents, seventhly, obtaining a lengthy student visa, eighthly, enrolling in a second university, in - ninth, successful studies at a foreign university; and tenth, defense of master's theses, similar to graduation qualification work.

This list seems very long and very complicated, but practice has shown that, if desired, almost 100% of applicants cope with the task successfully at the highest level, that is, the defense of diploma work at both universities on time. A small percentage of relative failures is a small delay in defense at one of the universities, which can only be regarded as a small non-fatal difficulty, since the delay is provided enough, and if desired, the student can quite successfully defend his master's thesis in the new term.

The advantages of this method of obtaining education are many, the disadvantages are not known to us, except, perhaps, the need to pay a little more attention to the study of a foreign language and the practice of speaking it, as a rule, it is English, which has established itself as the language of international communication in all areas of science, technology and technology (even in biology and medicine, where the Latin language remained only for the names of plants, animals and medicines).

But, firstly, if a student has already chosen a technical specialty as a base for future production activities, then refusing to study English profoundly is illogical. Most of the most important literature on any technical specialty is published and widely available primarily in English. It is impossible to keep abreast of the modern element base in electronics, micro-electromechanical modules, sensors, actuators, other elements and devices of automation and computer technology without sufficient knowledge of the English language. Secondly, it is impossible not to have the ability to learn a foreign language, you can only do or not do it. If small children cope with learning a language without the help of dictionaries and automatic translators, just listening and memorizing, then a reasonable adult can sufficiently master the language, for this there are many modern techniques, the main of which are reading, speaking, listening, watching, repeating and, as a result, remember. Thirdly, let us recall the famous aphorism that a person is as many times a person as he knows foreign languages (attributed to Karl the Fifth), or less well-known: "He who does not know foreign languages has no idea about his own." (I.V. Goethe).

1. ESSENCE OF THE DOUBLE DIPLOMA PROGRAM

The main idea of the program is to provide the student with the opportunity to receive two diplomas as a result of one term of study. This seems impossible, since training in only one university gives only one diploma in the end, to obtain a second diploma, it would seem, training in a second university once again over the same period.

However, there are, for example, programs of the second higher education based on the first. In this

case, the student studies only those subjects that were not in the list of subjects already studied by him for the first term of study. If, for example, a student has already studied mathematical statistics, and in his first diploma there is a positive mark for this subject, then instead of re-studying the same subject, he can be given a re-reading of this subject. This is possible provided that the university where the student receives a second higher education recognizes the results of the first higher education. There is no reason for non-recognition, since the formal accreditation of the quality of education is the state accreditation of higher education organizations.

Imagine that with this approach, all available items coincide. Then, it would seem, it turns out that to obtain a second diploma, it is enough to simply present the first diploma. But in practice this, of course, is impossible. But if two universities have agreed that they open a double diploma program, then students have the opportunity to enter such a program. In this case, in the first year a student is studying at a university in his homeland, in the second year he enters a foreign partner university without being expelled from the first university. He physically moves to this university, that is, moves to the city where this university is located for the duration of his studies, and attends the university on an equal basis with other students of this university. At the end of his studies, he defends the theses at this foreign university, receives a diploma there, after which he returns to the university where he received his first-year education, and defends his master's thesis there, after which he also receives a diploma from this university.

It turns out to be much easier for a student than for universities, since the student does not face the formal difficulties that the administrations of these two universities have solved for him. Therefore, there are not many such programs, and it is not so easy for a student to find such a program according to their professional interests, and if he is lucky and there is such a program, it is unreasonable to miss such an opportunity.

2. WHAT IS REQUIRED FROM UNIVERSITIES?

It is required for the implementation of such programs, first of all, the formal equivalence of the curricula of two curricula of different universities, despite the fact that each country has its own educational standards, which in some cases differ so dramatically that, at first glance, it is impossible to draw up such a curriculum, which would comply simultaneously with the standards of these two states.

The mechanism of program synchronization is rather complicated; it is described in our other publications in sufficient detail [1–6].

It is necessary that all subjects that should be studied according to the curriculum of a European university, be studied also according to the plan of a domestic university and vice versa. At the same time, the volume of the training load cannot be increased,

but it is also impossible to do without it, since some subjects cannot be recognized as identical or replaced with identical ones. The curriculum of the technical areas of training according to the educational standards of the Russian Federation requires the presence of non-technical subjects, such as a foreign language, the basics of psychology, and so on. No non-technical subjects are usually present in the curriculum of European universities. Therefore, those subjects that do not fit simultaneously in both curricula, the student must master as optional. In any case, each of the two curricula must be fully implemented, and practice has shown that this is possible.

Universities are required to recognize the legal equivalence of those subjects that are truly equivalent, to include in the list of elective subjects those that are mandatory at the partner university, and difficult decisions in all other subjects that do not fit into this scheme.

3. FEATURES OF THE SITUATION IN THE CONDITIONS OF A PANDEMIC

As a result of the pandemic, almost all countries closed their borders. Trips of students and teachers became impossible, in some cases they even had to hand in tickets, some expenses that were irrevocable, became the net losses of participants in such programs.

In this situation, the importance of distance education methods and the use of online educational programs has grown.

The learning process consists in the transfer of knowledge from teachers to students, in the control of their assimilation, in the student's practical work, in the final qualification work. The transmission of information may well be carried out by remote methods. Knowledge control is remotely more difficult, but possible. Remote hands-on labs are even more complex. Final qualification work can be formally performed remotely, but most European universities do not recognize this method due to the peculiarities of the organization of the educational process in them.

Since almost all universities of all countries switched to distance learning in March-June 2020, there are significant differences in the educational opportunities of students who are present in the city where the university is located and those students who are in another city and even in another country, almost no left.

Namely, let us consider, for example, how the situation developed at the Technical University of Liberec.

Here, the first wave of coronavirus was mitigated by stringent conditions, including the closure of the university and work at home (March - May 2020). In March, students were invited to go home.

The following software tools and products were implemented in distance learning:

a) The educational portal of the university elearning.tul.cz (Moodle is supplemented by

connecting to the IS / Stag information system, presentations of individual lectures are available).

b) Streaming lecture system; Stream lectures on each subject are available to students.

c) Google Meet,

d) Google Classroom,

d) Zoom,

f) Individual contact with students to solve some problems at the end of the semester.

During this busy time, students were not allowed into classes and laboratories. The entire campus was quarantined.

After the first graduation, students of past years could come to the laboratory individually, but they had to meet the following conditions:

a) contact your supervisor (to open the building and laboratory),

b) sign written statements stating that they have no symptoms of the disease or are not in quarantine;

c) to disinfect hands at the entrance to the laboratory / classroom where the exam was held,

d) use a mask and keep at least 2 m.

Mandatory wearing of masks was introduced inside university buildings (including the university cafeteria), in public buildings, shops and in public transport (see Fig. 1).

After the end of the first wave, when a new stage began (the university buildings opened), the rules boiled down to the following:

a) students must sign written statements that they do not have symptoms of the disease or are not in quarantine,

b) it is necessary to disinfect the hands at the entrance to the class where the exam was held,

c) it is necessary to use a mask and keep at a distance of at least 2 m.

Mandatory wearing of masks remained inside university buildings (including the university cafeteria), in public buildings, shops and in public transport.

Borders with individual EU countries have been relaxed, where the situation is similar to the situation in the Czech Republic.

Traveling to countries with a very high prevalence of coronavirus remained impossible.

In Germany, those students who managed to arrive (from the Gagarin Yu.A. Saratov State Technical University) studied remotely while in student dormitories, and those who had to return tickets because flights were canceled (from Novosibirsk State Technical University) were also trained in distance form, but from Novosibirsk.

Theoretically, it is not very important where the student is studying from if he is distance from the university. However, the legal difference is big. Students who are full-time, only part of their studies spent in the distance mode, while those who could not get to the European University, did not legalize their studies at the proper level.

Fortunately for them, they still have two semesters ahead of them, during which they get a chance to come to the university and carry out the

necessary amount of full-time education as soon as the quarantine is canceled and the borders open.

If these were second-year students, then training would also be possible for them, but formally it would not be training under the double diploma program, but training according to the second higher education scheme on the basis of the first higher education already available. The difference, it would seem, is small, but the help from universities in which primary education is carried out can no longer be received in the same amount for some formal reasons. First of all, a university can promote student mobility, pay a scholarship and pay some expenses on a competitive basis or from existing grants, especially if there is a grant specifically for organizing such mobility. But after formal protection and obtaining a diploma, a student ceases to be a student, therefore, such assistance cannot be provided to him.

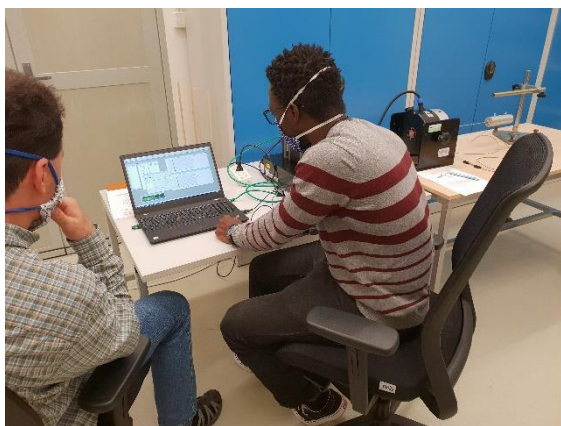


Fig. 1. Laboratory work in TUL during quarantine. Dynamic measurement of piezoelectric coefficient

Another possibility in this case is admission to graduate school, but a person studying at the graduate school of one university, apparently, cannot simultaneously study at the magistracy of another university, and there is not much sense in this. In this case, it seems more appropriate to try to enter the graduate school of this European university, but this is a completely different form of educational mobility, the discussion of which is beyond the scope of this article.

4. PROSPECTS FOR THE DOUBLE DIPLOMA PROGRAM IN THE 2020-2021 ACADEMIC YEAR

Currently, students and teachers are concerned about the prospects of teaching students a double diploma program in the upcoming school year, which will begin in September this year and end next summer.

The technical universities of Novosibirsk and Saratov offer students a unique opportunity to study under the master's program of double diploma with the Technical University of Chemnitz (Germany) in the direction of "Smart city technology and the Internet of things". Under this project, students have

the opportunity to study for the first year in one of these Russian universities, and the second year should be studied in Germany, at the Technical University of Chemnitz. These technologies are very relevant [8–9].

In addition, NSTU continues its joint program with the Technical University of Liberec (TUL) in the field of "Automation and Mechatronics" [4–7]. Within the framework of this program, which began as TEMPUS-MPAM [5] and continues with the support of the Erasmus + Foundation, NSTU sends almost two to three students to TUL almost every year for 9 months, and the program pays for travel and accommodation according to established quotas and rules. The success of education under this program is approaching 100%, namely, for the entire period only one student did not have time to defend the theses in a European university in a timely manner, which is to some extent due to additional difficulties in a pandemic, since the work was supposed to be mostly practical, but this student was completely successfully completed the rest of the educational program, so he retains the ability to successfully defend within the time frame set for this case. This student successfully defended his master's thesis at NSTU, "excellent", so at least he did not lose anything from his participation in the program, and all opportunities are fully preserved. All other students with a total of more than a dozen successfully defended their master's theses at both universities with excellent marks, and approximately half of them entered the graduate school of TUL.

5. ADVANTAGES OF THE CURRENT SITUATION

In contrast to the situation of previous years, students oriented to the double diploma program between NSTU and TUL have an additional advantage. It consists in the fact that it is already known that the indicated mobility in the upcoming school year will be supported by the ERASMUS program. Previously, students had to participate in the competitive selection and draw up documents without confidence in receiving funding, since information on receiving support appeared only in early June, while paperwork should begin in February-March in order to get a long-term visa and all other documents. Now, for them to participate in this program, it is enough to enroll in a master's program in "Management in Technical Systems" at the Faculty of Automation and Computer Engineering at NSTU, and pass a competitive selection at the end of winter 2020, where academic performance and knowledge of the English language are checked. In the SSTU named after Gagarin Yu.A. The program is being implemented in the direction of "Information Systems and Technologies". Recall that the Erasmus + Foundation pays for travel and provides scholarships for the period of study at a European university [10].

6. SELECTION OF STUDENTS FOR PARTICIPATION IN THE PROGRAM

Students are selected for participation in the Smart City program [11] by interviewing teachers with applicants, see Fig. 2–4.



Fig. 2. Interview with a student in the selection for participation in the double diploma program



Fig. 3. Interview with a student in the selection for participation in the double diploma program (continued)



Fig. 4. Interview with a student in the selection for participation in the double diploma program (continued)

Questions are asked in English; answers should also be in English. It should be understood that, along with the opportunity to answer questions in the

professional field, it is necessary to be able to conduct a normal household conversation, since this is necessary for successful temporary integration into the European community, which is necessary for successful training. Indeed, a person with sufficient knowledge of the English language in Europe is pretty comfortable everywhere.

As part of the program [11], the project participants prepared a series of textbooks in English that are designed according to a single template (see Fig. 5-6), each of the project participants sending their students to European universities (six universities) prepared three of these textbooks, the total number is thus eighteen. All these textbooks are placed in a hybrid educational space created by NSTU.



Fig. 5. Textbooks in English written in the framework of the double diploma program “Technologies of a smart city and the Internet of things”

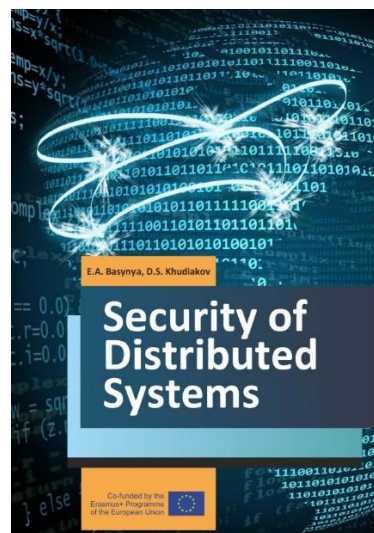


Fig. 6. Textbooks in English written in the framework of the double diploma program “Technologies of a smart city and the Internet of things”

7. DISCUSSION AND CONCLUSIONS

The mobility of students and teachers temporarily ceased due to the pandemic; however, this is not a cause for gloom. Much can be done remotely, in the very near future you can hope to open the borders and to resume double degree

programs, so you should not waste time while you can use it to improve your knowledge of the English language, to improve academic performance in important subjects and to prepare documents.

One of the important aspects of student selection is his motivation, that is, the ability to explain why he wants to participate in this program. As a rule, arguments indicate a desire to receive a high-quality education, an interest in the possibility of integration into the international scientific and technical community, a desire to get acquainted with the cultural achievements of foreign countries, to get to know people better, and so on. Generally, these guidelines can be called humanitarian and professional values.

Despite the fact that the generalized term "student" is used in the text of this article, one should not make the erroneous conclusion that only young men are selected to participate in the program. There are no differences in gender or other characteristics during selection, as well as on the basis of nationality, race, and others that have no relation to the opportunities and desire to learn. In Russian-language literature, it is not customary to be derogated, therefore it is not customary to apologize for various terms, since there is nothing to apologize to anyone who has not violated the rules of respect and correctness. Russia is the successor of the USSR, in which respect for all the peoples of the world and the equality of all sexes were spelled out in the Constitution. The fact that only young men were selected to participate in the program in 2020 is random; this is an ordinary manifestation of statistics in particular cases. We with the same desire will send students to study in this program, the program is open to all comers who have successfully mastered the curriculum and have sufficient knowledge of the English language.

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