

Regional Innovation Impact Assessment Framework Case Study "University of Ruse "Angel Kanchev"

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1 Introduction

The University of Ruse "Angel Kanchev" is a Bulgarian state university with over 70-year tradition of providing the region, where it is located, as well as the regions of its branches with experts in engineering. Furthermore, the university has a 25-year tradition in educating students in several other areas of higher education: social, economic and law sciences; education; mathematics and information technologies; agricultural sciences; healthcare and sport; national security. In the last 15 years there has been a sustainable tendency for 50-55 % of the students at the university to study in engineering degree programmes. Traditionally, every new degree programme is created with the sole purpose of meeting the demand of the region for professionals and innovative solutions, favouring the business. According to the European Innovation Scoreboard, from a Modest Innovator by 2016, Bulgaria has moved to the category Moderate Innovator in 2017 and the University of Ruse has a considerable contribution to this positive change. In the North Central Planning Region, where the city of Ruse is located there are 4 universities: technical, classical, economic and military, the University of Ruse being the only one in Ruse region. Two of the branches of the University – in Razgrad and Silistra, are within the same planning region and are also the only academic structures in the regional cities, where they are located. Another target region for the University is Targovishte - being in a neighbouring region, it also relies on the University of Ruse for experts. The newest branch (established more than a year ago) is in Vidin, located in the North western planning region of Bulgaria. The University of Ruse with its branches is the only academic structure in 6 out of 28 administrative regions (Ruse, Razgrad, Silistra, Vidin, Montana, and Targovishte), which makes one fifth of all regions in the country. By establishing the Vidin branch, the University of Ruse strongly confirmed its cross-border position, developed over the years, standing as the only multi-profile university in Bulgaria-Romania cross-border region. Due to its location and the impact it has on the Danube region, the city of Ruse is called "Danubean academic capital of Bulgaria".

Figure 1. University of Ruse's locations in the cross-border region Bulgaria-Romania



The University of Ruse not only has strong connections with the companies in the regions, where it is located with its branches, but also many of its graduates manage local businesses, including branches of international companies in its target regions. It is of

great importance that many of the key figures in the public institutions are alumni of the University of Ruse.

Box 1. Interaction with local business

WITTE Automotive, Bulgaria is an innovative company, part of a large international concern, which is one of the largest employers in Ruse. When it was established, and today, when it is expanding its production facilities, the company unequivocally refers to the University of Ruse with its education, research and innovations as one of the significant prerequisites for determining the location of the company. The long-term Executive Director of the company, Hristo Hristov, PhD is an alumnus of the University of Ruse and holds a Doctoral diploma from it. There are numerous analogous cases in the target regions of the University.

The eight faculties (Agrarian and Industrial, Mechanical and Manufacturing Engineering, Electrical Engineering, Electronics and Automation, Transport, Natural Sciences and Education, Business, Law, Public Health and Healthcare) cover eight of the nine areas of higher education in Bulgaria.

Table 1. University of Ruse: basic facts.

Year	2010	2017
Budget, euro	9 780 819	10 907 944
Lecturers, number	470	420
Researchers, number	420	390
Students and PhD students, number	10000	8000

Source: Own data, 2018.

The development and the varied contribution of the University of Ruse to its regional innovation ecosystem are outlined in four sub-paragraphs, divided according to four categories of impact.

2 Regional leadership

The University of Ruse "Angel Kanchev" is among the Bulgarian universities with the strongest regional orientation and impact. From its establishment in 1945 as the first higher technical school out of the capital to its transformation into a multi-profile university in 1995, the University of Ruse has been training experts in engineering, fully relevant to the needs of the region and the country for innovative technological solutions in the industrial and agrarian sectors. At the end of this period, coinciding with the reforms towards democracy and market economy in Bulgaria, as well as with the Euroatlantic orientation of the country, the University *strongly intensified its work with the business and local authorities in the region through a number of initiatives*: Employers Days, developing Information Portal for Business Partners, joint projects with the business under the Operational programmes of the Bulgarian government, financed by EU structural funds, etc.

The University of Ruse plays an important role in the configuring of the regional systems and policies – a team of the higher school has authored the Regional Strategy for Development of Ruse Region 2014-2020, lecturers who are experts in regional development are developing interim evaluations of implementation of the regional development strategies (Vratsa, Montana) and the municipal development strategies (Ruse, Vetovo, Dve mogili, Tsenovo, and others). Furthermore, representatives of the university participate in all specialized committees, established at regional and municipal levels and have a significant contribution to solving local and regional problems in Bulgaria and the Bulgarian-Romanian cross-border region.

The University of Ruse has initiated the establishment of a Forum for regional development and cooperation in the framework of North Central region. Cooperation agreements have been signed with the Governors of the regions along the River Danube. A Regional Alliance for University and High School Cooperation was founded in 2017 and is the first of its kind in Bulgaria. For the last 20 years, the University of Ruse has organized Ruse Exhibition of agricultural machinery, automobiles and computer equipment for the companies from the region and the country while in the last 3 years, it has initiated and organized the Innovative Youth EXPO, where high school and university student teams present their innovative ideas and developments. The latest edition of the EXPO in June 2018 was held as part of the event „HEInnovate: Support for institutional change in higher education", hosted and co-organised by the University of Ruse, together with the European Commission and the Ministry of Education and Science of Bulgaria in the frame of the Bulgarian Presidency of the Council of Europe. The event was part of the agenda of European institutions for higher education to change their strategic vision and priorities in compliance with the changing external environment, EU labour market and the demands of the new generation of students.

The work of the University *as part of the regional innovation ecosystem* has been particularly pronounced in the past 10 years, when the higher school in Ruse gained leadership positions in Bulgaria in implementing innovation educational technologies through coordinating 4 international projects in the field of computing, the latest having 67 partners from 35 countries. The European commissioner on digitization and digital economy supports the ideas in the Concept for adaptation of education to the digital generation, developed by the University of Ruse and has declared her intent to reflect some basic statements of this Concept in the European Digitization Plan. A serious input is the Project for digitization of cultural heritage, implemented successfully under the Programme Interreg V-A Romania – Bulgaria. The project team was invited by the Ministry of Tourism to represent the University of Ruse and Bulgaria with a digital corner at the World Tourism Fair in London in November, 2017.

The University of Ruse fulfils its *role of a regional leader and guarantor for regional development* for the regions it services and, on a larger scale, for the cross-border Bulgaria-Romania region of the Danube macroregion. Some points to be highlighted in this respect are: the long-term membership of the University of Ruse in the Danube Rectors'

Conference (the only Bulgarian university in this organisation), the participation in key projects under the European strategy for the Danube macroregion, e.g. Danube:Future and Danube-Inco.net, the successful implementation of more than 20 projects under the programme for cross-border cooperation Romania-Bulgaria, hosting of the 5th meeting Asia-Europe /ASEM/ on the issues for water resource management and sustainable development in the Danube – Mekong river basins, hosting the meeting of the presidents of Bulgaria, Austria and Romania on 4th May, 2018, accompanied by the conference "Sustainable Development of the Danube Region", organized by the University of Ruse, etc.

Besides participating and initiating public events to benefit the regions it services, the University of Ruse asserts daily its regional orientation through education and science as main priorities of its mission.

The University supports a special website of the Centre for Career Development, where employers advertise vacant work places and internships during the period of education, to benefit the students. A similar site is supported for graduates, united in an Alumni network.

The existence of a strong multi-profile university such as the University of Ruse in Northern Bulgaria and the Bulgarian part of the cross-border region along the Danube is an attractive centre for international investments. A number of international companies like the French company Montupet and the German Witte Automotive have declared repeatedly that it is the presence of a university and the opportunity to employ highly qualified workers has motivated them to invest in Ruse.

3 Support to human capital development and entrepreneurship education

The graduates of the University of Ruse find realisation mostly in the target regions of the university. About 67% of them start work in companies, institutions and organisations in these regions. Up to 5 years after graduation the degree of employment of UR graduates is an average of 97%. Over 50% of the graduates find jobs in the field of the degree programme they have graduated in, both in Bulgaria and abroad. The rest are employed in spheres close to their specialization or are elected to public positions.

The salaries of the alumni of the University of Ruse are about 10% higher than the average for the respective region.

The University offers degree programmes in 23 professional fields from 8 areas of higher education, each of which is in high demand in the region. All curricula and syllabi are updated in accordance with the recommendation of practitioners, many of whom are reviewers of the study documentation and participate in teaching and methodological committees, as well as in the teaching process in specific degree programmes. Around 60% of the diploma theses topics are realistic assignments from the business organisations. In these cases, the students have both an academic advisor and a mentor-expert from the respective company. Business experts take part in the State Exam Commissions and the Diploma Thesis Defence sessions with an equal vote to that of the academic members of the commission. One of the master's degree programmes in the field of computing has been developed jointly with a local software company.

Boards of Trustees work at university and faculty levels, with representatives of companies in the region. The regional business undertakes serious commitments when it comes to appointing Ruse university graduates, with 75 % of the alumni conducting practical training and getting employment in the target regions of the University. Career orientation of the students is done at an early stage of their studies through meetings with employers during the annual Career days at the university. The faculties publish an annual Almanac of alumni, describing their profile. Conducting joint information campaigns with employers is common for the degree programmes which are promising for the labour market, for the practical realisation after graduation and for popularising the additional skills and abilities, which are important for the employers.

The main goal of the University is to maintain continuous relations and mutual awareness between the higher school and employers, in order to facilitate the transition from higher education to employment and to maximise the benefits for the two parties.

The University has signed Contracts with companies for outreach practical training in these. Modern technological equipment and organisation of work in these companies aid students in acquiring better skills for their career. At the same time, companies invest in building modern laboratories in the university. For the period 2010-2017 company investments in lab equipment are to the amount of approximately 2 500 000 Euro. Due to the multi-profile nature of the University students from various degree programmes are trained in the laboratories.

Students are encouraged continuously for extracurricular work in teams, where companies and organisations participate as well. The professional student clubs in the fields of education involve around 800 students, who develop specific ideas, products and learn to work jointly with the local business, including attracting of funding for their developments from the local companies.

Around 100 representatives of partner companies are surveyed annually for obtaining feedback on their suggestions, as well as the knowledge and skills of the students working with them. Additionally, there is an opportunity for online surveys of organisations and companies in the University's website.

With the active involvement of employers, the University conducts market research on the labour market on trends in wages, on demand and supply of the labour market, with the purpose of updating the syllabi and optimising the number of students and their structure.

The traditional opportunities for interaction between university and employers such as conducting workshops, lectures, trainings with the participation of outsourced lecturers; negotiating internship programmes in realistic working environment for the students and for their graduation are widely employed.

Looking for opportunities to offer part-time work for students as a source for financial stability during their studies, and also as a way of developing their general work skills is a task that has always been a priority for the university and faculty leadership. Besides, the University of Ruse has provided opportunities for part-time work in some of its structures.

The University is accredited for 50 PhD programmes. About 40% of the topics for the PhD programmes have been initiated by the local business.

The University has a very well-developed Centre for Continuing Education, which offers opportunities for lifelong learning. An average of 3000 adults have improved their qualification in the fields of education that are accredited for the University in the last 5 years. At least 50% of the courses have been ordered by the businesses while many are taught at the premises of those businesses and organisations.

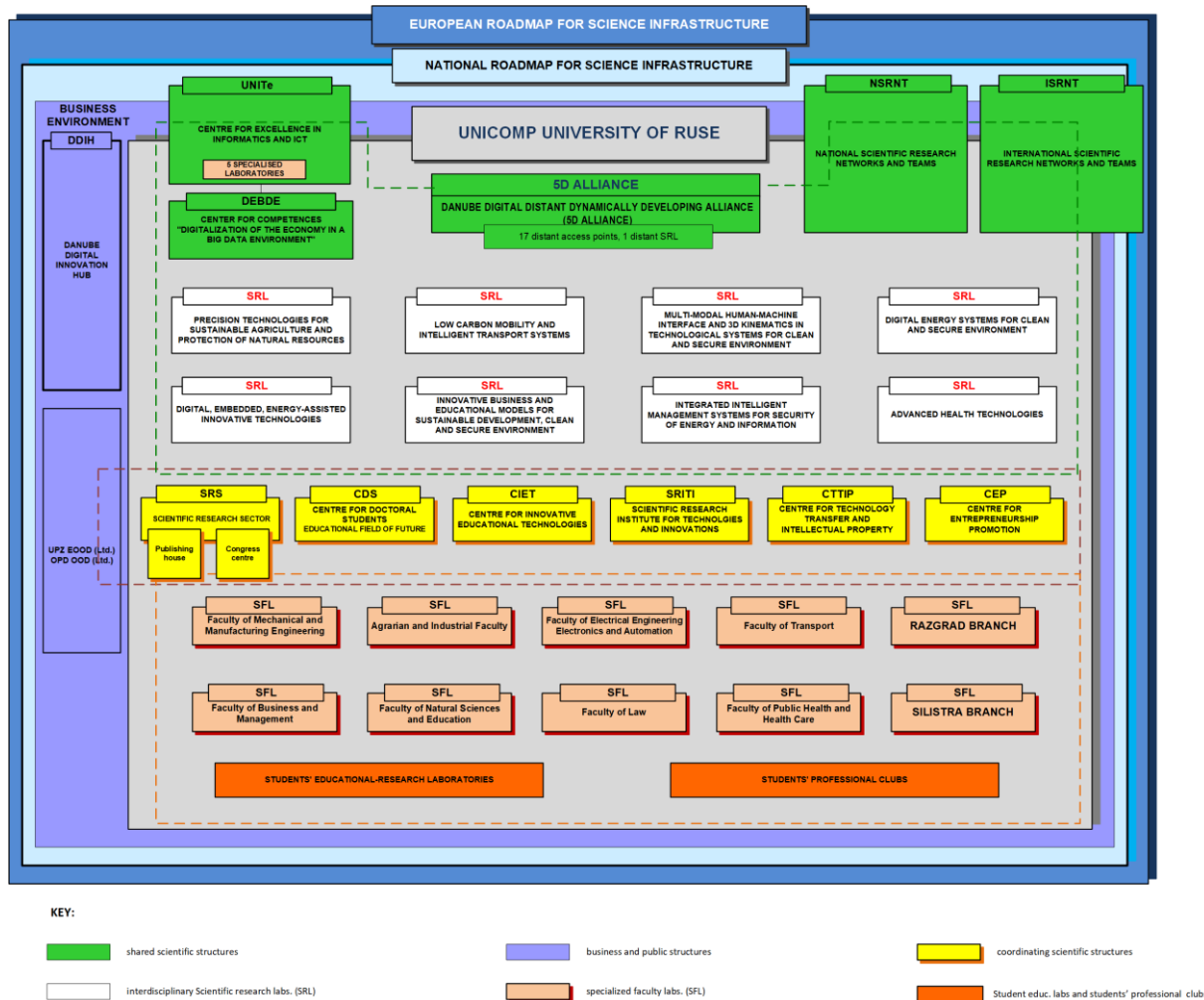
Distance learning is actively used in the University, together with other forms of computer-aided learning. These modes are strong support for acquiring information and knowledge and are accepted as serious alternatives of the traditional forms of education or as their complementation. The University is using a platform developed by team of lecturers and students and over 800 education courses have been uploaded on it.

For about 3-4 a university team has been working on using the add-on and virtual reality environments in their various forms, which for the moment cannot be used on a broad basis because they are still rather expensive, but just like with mobile devices, whose prices are constantly decreasing with their increasing usability, we have to be ready to provide their wide availability when the time comes.

4 Knowledge generation and knowledge transfer

Research in the University of Ruse is conducted by individual lecturers or by research teams, formed by representatives of representatives of the academic staff of the higher school, other higher schools and experts from practice, PhD students, post-doctoral students and students. Researchers from the University have the academic freedom to conduct research as well as joint research, project and innovation activities with other higher schools and organisation in the country and abroad, according to Art. 20 of the Law for Higher Education of the republic of Bulgaria. The main structure of the University, which unites the academic staff for conducting long-term research, is the University Research Complex (UNICOMP). In the time of building a knowledge-based economy, the role of this complex is to become a centre for applied innovations and entrepreneurial training at a national, regional and international level. The Research Complex is the most important resource for smart growth during the second decade of the 21st century.

Figure 2. University of Ruse's research complex UNICOMP



From 2013 to present, the University of Ruse has participated annually in the new European rating system U-Multirank, being one of only a few Bulgarian participating universities. Besides the institutional assessment, 7 professional fields (1/3 of all professional fields in the university) and 4 faculties (1/2 of the faculties) have been reviewed. The results from the rating show that the University of Ruse is comparable to famous universities in terms of quality while in some indexes it even surpasses its counterparts.

The University of Ruse is a research organisation that develops dynamically and has a strong regional impact, meeting the criteria of moderate innovators under the afore-

mentioned European Scoreboard. Fundamental and applied research is conducted in the University, relevant to the research fields, position and profile of the higher school in the European and the national research and educational system. The University is multi-disciplinary and is prominent in most engineering, humanitarian and business-oriented thematic areas, but its positions in the field of applied informatics and information technologies, transport, mechatronics and clean technologies, humanitarian and social sciences are particularly strong.

Box 2. University of Ruse in the new European ranking system U-Multirank

In 2013, the University of Ruse participated in the first edition of the new European ranking system U-Multirank, together with 850 institutions of higher learning, 1000 faculties and over 5000 degree programmes from 70 countries worldwide. Unlike Academic Ranking of World Universities (ARWU), or the British Times Higher Education of world top-400 universities, U-Multirank does not base its ranking on complex results, allowing its users to identify their strengths and weaknesses, as well as these aspects of their activities which are their biggest priority.

The University of Ruse presented data on professional field 5.5. Mechanical Engineering, from area of higher education 5. Technical sciences. Mechanical Engineering degree programme at the University of Ruse is compared to the analogous field in 20 German higher schools (two in Aachen, Braunschweig, Chemnitz, Darmstadt, Dortmund, Essen, Nuernberg, Hanover, Ingolstadt, two in Karlsruhe, Konstanz, Magdeburg, Munich, Osnabrueck, Paderborn, Reutlingen, Saarland and Zuerich) and seven French higher schools (Grenoble, Catholic University - Lille, University Marne-la-Vallee, Higher school in Nantes, Technical school in Paris, University Paris-West, technical University in Troyes). The similarity marked in the U-Multirank system, between the listed higher schools is that they have a strong regional focus. It is the regional impact of a given university that is one of the main indicators of the above-mentioned rating system.

In 2014, the University of Ruse is one of two Bulgarian higher schools, participating together with 1210 universities worldwide in U-Multirank with professional field 4.6. Informatics and Computer sciences. This field of the University of Ruse received one of the highest accreditation evaluations of the National Evaluation and Accreditation Agency in Bulgaria. The degree programme „Computer Sciences“, the master degree programme „Software Engineering“, developed and realised jointly with the software company „Sirma ITT“ plc. And the PhD programme „Informatics“. From the results published in April, 2015 it could be seen that the ranking of the University of Ruse precedes that of higher schools from Stuttgart, Hanover, Hamburg, Potsdam, Orleans, Toulouse, Liverpool, Nottingham and others. The University is among the first 35 out of a total of 276 higher schools from the EU under the 6 criteria for education and training. It is second under the criterion „International Research Scholarships“, in the top 20 under the criterion „Involving practical experience in the degree programme (for Master degree programmes)“, while under the criterion „Student internships in companies“ it is among the first 25. The students, evaluating their training under 8 criteria, gave evaluations that put the university among the first 25 yet again while under the criterion „Quality of teaching“ the University is number 3. Over 300 students and PhD students study in the degree programmes „Computer Sciences“, and „Informatics and IT in Business“; Master degree programmes „Software Engineering“, and „Informatics“, as well as the PhD programme „Informatics“.

In the latest edition of the rating in 2017, the competition was between 1500 universities from 99 countries and over 100 000 students from those institutions. The achievement of the University is related to the Bachelor degree programmes „Business management“ and „Public Administration“, and the Master degree programme in “Business Administration”, the evaluation being based on the last 3 years. After analysing the information provided from other Bulgarian universities, offering training in the field of business, the University of Ruse has been awarded for completeness and exhaustiveness of the parameters disclosed, as well as for the high evaluation from students, in view of their internships in the region, the quality of the teaching staff and many other academic activities.

The University of Ruse conducts a large-scale innovation activity, directed towards implementation of the research results. In 2008, the University established its own Technology Transfer Centre (TTC). It offers support to the university staff for attracting private financing and contract work. TTC performs its activities in accordance with the policy and regulations for intellectual property of the University of Ruse; the policy and the regulations for exploitation and commercialisation of research results, incl. the structure for knowledge and technology transfer; the regulations for institutional implementation of the European Charter for Researchers and the Code of Conduct for Recruitment of the European Commission. A strategic programme for R&D for a 10-year period has been approved. The innovation products (71 for the period 2012-2017), are expressed mainly through development of patents, useful models, author’s certificates and prototypes. There is a wide participation of the academic staff in the implementation of research projects and in providing qualified consulting and expert aid to the representatives of business and public administration.

Funds acquired through research activities for the period 2013-2017 amount to a total of 5 343 743 BGN: 2013 – 1 291 257 BGN; 2014. – 1 298 439 BGN; 2015 – 1 113 722 BGN; 2016 -1 640 325 BGN; 2017 – 1 784 384 BGN, respectively.

In the period 2012-2017, there is a sustained participation of the University of Ruse in the implementation of projects, financed under international and national programmes. For the reference period the University is a leading organisation or a partner in 438 projects, financed under Operational programmes of the Bulgarian government, under various European projects, under the national Research Fund and business contracts. Besides, a number of research projects, financed by the state budget (88 projects per year on average) have been implemented. The funds attracted through implementing projects under national and international programmes amount to 20 070 450 BGN.

The project “Innovative partnership network for sustainable development university-business” stands out. To support this statement comes the first position won in the National competition for innovations in career information, orientation and consulting in Bulgaria with the web-based platform DanubeIncoNet, developed under the project. The platform was presented as a good practice and was highly evaluated at workshops in Brussels and Sofia, organised by the European Commission and the Organisation for Economic Cooperation and Development within the initiative HEInnovate – a tool for assessing the entrepreneurial and innovation environment in the higher schools.

With the assistance of the experts at the Centre for Technology Transfer, the University participates successfully in the project competition under the Operational Programme Science for Smart Growth in 2017 for building Centres of Excellence and Centres of Competences. The project value of the three starting Centres with the participation of the University of Ruse in a shared scientific infrastructure: (1) DEMDE – Digitisation of Economy in Mega Data Environment; (2) USSGe – Universities for Science, Informatics and Technologies in e-society, and CSSCRI – Centre for Smart Solutions in Creative and Recreative Industries is a total of 21,5 mln BGN.

The quality of research works of the lecturers and their popularity and research scale can be monitored through their citation rate in referenced and indexed scientific publications. Totally for the period 2012-2017, research works of 52,3 % of the academic staff have been cited, with a tendency of growing numbers of citations both in research publications

referenced in Scopus and Web of Science (a total of 830 or the period), and in other indexed and referenced bases (Google Perish, EBSCO, RePeC, ERICH+.) - 473.

The University has created a favourable environment for intensive research life through scientific communication and research, as well as personal motivation of the lecturers to participate in environment. 85,6 % of the full-time lecturers have participated in 1695 scientific forums, amounting to an average of 4,57 participations per lecturer for the last 5 years.

The number of Editorial boards where lecturers participate has doubled in 2017 compared to 2012, with a total of 104 Editorial boards of scientific journals, of which 35,6 % international and 64,4 % - national.

Box 3. Results and acknowledgements of R&D activity of University of Ruse

The outcomes of research and development activities of the University have led to a significant impact on the regional research infrastructure of North Central Planning region of Bulgaria. The University is an active participant in the National Branch organisation for Electric Mobility - IKEM, as in 2016, a research team of the faculty of Transport, together with Transport Electronics, Ltd and The Institute of Electrical Chemistry and Power Systems „Acad. Evgeni Budevski“ with the Bulgarian Academy of Sciences was awarded the Prize of the Bulgarian Chamber of Industry for "Realisation of innovative product based on Citroen Berlingo, related to the development of ecological transport vehicles and increasing their energy efficiency, including software tools and technologies for conversion of electric vehicles". The development involves: a dynamic model of electric drive for electric vehicles and software; a water cooled synchronous electric motor with permanent magnets; drive unit for electric drive for conversion and electric transport vehicles with setup software; use of lithium high voltage battery packs.

Interdisciplinary teams of the faculties of Transport, Mechanical and Manufacturing Engineering and Electrical Engineering Electronics and Automation participate in research and development in the competition for energy efficiency in transport Shell Eco-marathon Europe for 5 years in a row. In the competition held in London for a third time as part of the festival "Build the Future" on 5-8 July 2018, in the most competitive category of "Prototypes driven by electric battery", team Automobile driver of the University of Ruse ranked in the top 10 out of 53 participants, occupying the prestigious 9th position. The young engineers drive the distance of 472 km with 1 kWh. The second team of young researchers - HydRu, competing for the first time in Shell Eco-marathon in the category „City car“ with hydrogen fuel cell, ranked 5th, with a result of 116/m³. The same team had an excellent presentation in the international competition Shell Eco-marathon challenger event in October, 2017 in Istanbul, winning the award for Best Design with their hydrogen fuel cell driven electric car. The developments of the young researchers are supported through special materials, technology transfer and funding by: of The Rectors' Body, Student Council of the University of Ruse, Municipality of Ruse (Bulgaria), "Ruse – the free spirit city" Foundation, Shell Bulgaria JSC, Fibran Bulgaria JSC, Dunav Auto 2012 Ltd, Iris Ruse Ltd, Bestimex JSC и компаниите "Hobby Car", „Saksa Fuels“, "Discordia", „Quis Nostrum“, „Witte Automotive Bulgaria“, „Carness“, „Gera“, „Trier“, „Miro Design“.

5 Support to enterprise development

The University of Ruse has a common understanding of the importance and role of entrepreneurship in the development of universities and, therefore, the University's Development Strategy is aimed at creating an entrepreneurial culture, stimulating interdisciplinary educational activities that allow students from different faculties and departments to create, experiment, test and apply new knowledge and technologies.

The perception of the university as entrepreneurial by its external partners is a long and repetitive process with many stages. The inclusion of entrepreneurs in governing bodies, examination commissions and in the learning process is evidence of good interaction with the socio-economic system of the regions in which the university is presented. University of Ruse also invests in building new skills and knowledge in academic staff applicable to entrepreneurial education of students. Participating in international thematic networks and "train the trainer" sessions allows university staff to have the opportunity to learn alongside similar ones from other higher education institutions in Europe.

The University of Ruse is distinguished by the fact that there is a model for coordinating and integrating entrepreneurial activities at all levels throughout the organization. It is also a good practice to create a Centre for Entrepreneurship Promotion, which together with the Technology Transfer Office helps to develop the capacity of future graduates to learn and adapt to changes or, in exceptional cases, to head the changes themselves. The Entrepreneurship Development Program is supported by a variety of sources of funding and investment, including investments from external stakeholders. In this aspect, students are not passive - they apply flexible approaches to self-organization and the conditions for business incubation, mentoring and participation in various initiatives are an example in this respect.

The university systematically encourages the entrepreneurial behaviour of staff and students. Since 2001, University of Ruse has been running an annual business plan competition (individual and teamwork) where the proposals are evaluated by a panel of lecturers and practitioners, qualified to award the best ideas. The collaborative work of lecturers and practitioners in the classroom also facilitates quality control. The creation of teaching and scientific teams when designing a course content, enables the co-operation between university lecturers, students and entrepreneurs, and is a prerequisite for the high feasibility of entrepreneurship training. University of Ruse offers opportunities for students and teachers to experience entrepreneurship by organizing events, business fairs and consulting projects that allow students to experience what it means to take responsibility, how to cope with short deadlines and stress, how to maintain good relationships with clients and partners.

University of Ruse offers elements of entrepreneurship education in bachelor, master and doctoral programs. Apart from extracurricular forms and elective courses there are also compulsory courses for some bachelor and master programs. This is a good starting point for embedding entrepreneurial learning in curricula. Entrepreneurial modules and courses are also offered as part of lifelong learning programs. The university has a Master's degree programme in Entrepreneurship and Innovation, originally created with the help of Delft University (the Netherlands). Startup training is open to all students, regardless of their degree programme because many innovative and vibrant business ideas arise from the merging of technical, scientific and creative programs. There is a package of business start-up courses that uses creative teaching methods and is tailored to the needs of students, depending on their educational level.

There are already visible steps in the development of systematic studies on the subsequent development of university graduates. Alumni associations have been formed for maintaining close contact with graduate students, using them as a source of academic and business activities. Tracking students who have long been involved in entrepreneurial education activities is well developed because of the close professional links between students and their teachers. These contacts are often used to collect quantitative and qualitative data from former graduates in view of their expectations of university education

to develop the attitudes, skills and competencies needed to start and successfully develop a professional career.

6 Vision for future development and conclusion

The vision for the regional impact of the University is strongly embedded both in its mission and in its vision for development:

Mission: The University of Ruse "Angel Kanchev" is committed to distributing knowledge, conducting fundamental and applied research and implementing innovations in practice, thus contributing to preparing highly qualified specialists and also to the sustainable development of the region and the country. At the same time, the Mission of the University of Ruse is shared not only by the academic community, but also by the leading institutions and organisations in the city and the region, which assume that:

- The University of Ruse is a significant factor for the competitiveness of the city and the region, as a generator of comparative advantages and added value;
- The University of Ruse is a driving force of social development, due to its interdisciplinary profile and striving to be an entrepreneurial university of the future;
- The University of Ruse is emblematic for the city and the region brand as part of its cultural and historic heritage.

Vision of the University: Development and validation of the University of Ruse as a university of the future, where students, lecturers and administration are being nurtured and developed as independent individuals and excellent specialists; a university, which is a guarantor for the development of the region, the country and the world; a university with the future of a recognized leader in the national and international education and research space.

A prerequisite for the realisation of this vision is the active interinstitutional cooperation and the support extended to the university, as well as the socially responsible position of the academic leadership, who identify the following main contributions of the University to the development of the region:

- poly-functionality of the University and providing of advanced knowledge and practical skills;
- natural integration of scientific, research and educational processes with the participation of business and administration;
- strong orientation to applied research to benefit Ruse and the region and strengthen its position as a leading centre for the Danube space;
- joint international branding for permanent positioning and visibility of Ruse and the region;
- investments in infrastructure for knowledge and innovations;
- expert, trustworthy and internationally recognized partnership in initiatives, benefiting the city and the target regions of the University.

The vision is pragmatized through the formulation of 4 priorities:

- High quality of education and research;
- Strong international positioning;
- Active interaction with the external environment;
- Balanced internal environment with resources managed in a sensible and enterprising way and conditions for human potential development.

List of abbreviations and definitions

ARWU	Academic Ranking of World Universities
CSSCRI	Centre for Smart Solutions in Creative and Recreative Industries
DEMDE	Digitisation of Economy in Mega Data Environment
IKEM	National Branch organisation for Electric Mobility
R&D	Research and Development
TTC	Technology transfer centre
UNICOMP	University Research Complex
USSGe	Universities for Science, Informatics and Technologies in e-society,

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Annex 1. Good practices for fostering entrepreneurial education, startup mindset and business development at University of Ruse



University of Ruse is among the founders and active members of the **Academic Entrepreneurship and Innovations network Resita**, where 15 universities from Albania, Austria, Bulgaria, B&H, Croatia, Germany, Macedonia, Montenegro, Romania, Serbia, and Slovenia are cooperating together since 2008. The activities include: Exchange of module structures and descriptions of entrepreneurship and innovation management modules; Development of programs for mobility of lecturers / guest professorships and student mobility; Joint research projects in the field of entrepreneurship and innovation management; etc. One tangible result from the network is the **Journal of Entrepreneurship and Innovation**, which is web-based, published annually since 2009, bilingual and with editors from 11 countries (<http://fbm.uni-ruse.bg/jei/>).

The **Technology Transfer Office** (<http://tto.uni-ruse.bg>) of the University is an intermediary in the process of technology transfer between technology users and providers of these technologies from University of Ruse. TTO strives to meet the technological needs of companies with innovative and scientific solutions that are beneficial to society and at the same time provide revenue for research laboratories. This increases industrial capacity and maintains regional economic development, as well as enhancing the competitiveness of SMEs and encouraging the application of innovation through improved innovation structure and know-how. Since 2016 the TTO has adopted some of the approaches of Danube Transfer Center concept, within the activities in the FP7 project Danube-INCO.Net (<https://danube-inco.net/>). The investment for DTC concept was 54 491 Euro under the Danube-INCO.NET project and for 2016 the annual turnover (approx.) is 510 000 Euro from different sources - Scientific research fund, EU-funded projects, National and industry projects.



The **Master program "Entrepreneurship and Innovations"** started in 2009 by the support of TU-Delft (Netherlands), organized within the concept of Third generation university (3GU). Since then 84 students have been enrolled in it. In 2016 the program was redesigned, according to the Fedller model, where students receive consulting for their business ideas' practical application.

The **Centre for Entrepreneurship promotion (CEP)** at University of Ruse was established in 2008 with the aim of supporting the entrepreneurial activity mainly of students, as well as of professors from the University of Ruse. The Centre supports both start-up entrepreneurs and already operating micro and small businesses that are taking action to change their business. The main areas where the results of the Centre can be summarized are: (1) counselling and mentoring; (2) interaction with business and the business environment; (3) organizing events and initiating events and (4) measures to promote the activity; (5) effective attraction and use of resources; (6) sustainability initiatives.



University of Ruse through its CEP supports also a business incubating facility – **StartUp Factory**. It is registered as a separate NGO by alumni of the university and its mission is to support early stage startups, building key skills in demand by the market and cultivating the favorable infrastructure and environment for turning ideas into real products with a potential for commercialization. One of the start-up companies, created in the incubator –

ReCheck, which develops electronic labeling with blockchain technology, was nominated for most innovative company in the EUTOP50 contest at the conference "Hemicycle Start-up convention" in Brussels, November 28th, 2017 (<https://recheck.io>).

In the "**Consultation and mentoring**" field, the main event is the holding of the traditional university competition for the development of a business plan. Since the start of the initiative in 2001 a total of 314 students had participated in the contest. In its 2017 edition under the motto "Trampoline for Entrepreneurs", 47 students from 8 specialties elaborated 30 business plans, with finalists awarded at a seminar with business representatives, public institutions and the non-governmental sector. After receiving the Diploma, each participant presents his/her business idea. In 2017 the diplomas of the distinguished students were presented by representatives of: Regional Information Centre, Ruse; Territorial District Office - Ruse, DSK Bank AD, Ruse; Ruse Chamber of Commerce and Industry, Ruse; Inter Express Freight EOOD, Ruse. The main wish of the representatives of the business was to see more successful new entrepreneurs.

In the last 4 academic years, students from different programmes and faculties have been trained to develop their business plans by using the TECHNOSTART template of the Bulgarian Ministry of Economy. The results are: 2014/2015 = 144 students, 2015/2016 = 79 students, 2016/2017 = 134 students, 2017/2018 = 121 students.

Data from a Polish-Bulgarian research project with the participation of academics from University of Ruse discovered that for the last 10 years 134 students, trained in University of Ruse's Faculty of Business and Management have been involved in family business, most of them as next generation representatives that continue the business operations of their parents.



In the "**Interaction with business and the business environment**" CEP members and students take part in various events for entrepreneurship promotion like - StartUp Europe Week (EU initiative), Edit on the Road (Google, MOVE.BG), Town meeting for entrepreneurship environment development (Bulgarian Ministry of Economy), etc. Another example in that field is the organizing of Career days, which are mechanisms in the University of Ruse for breaking down traditional boundaries

and fostering new relationships - bringing internal stakeholders together (staff and students) and building synergies between them.

Another good practice explored in the university is to use **our students as mentors for entrepreneurial events in secondary schools** from Ruse and the region. Through mentoring in events ("Global money week", Junior Achievement Bulgaria; various innovation camps; "Day and night of the entrepreneur") they learn to perform consultancy services in the field of entrepreneurship,



innovate, think out of the box solutions/ react to new models, as well as realize another feature of being a businessmen giving back to society.

The **Innovative Youth Expo** is an event, which is already like a trade mark of University of Ruse. Its main concept is: the University to be an active environment for building horizontal and vertical relationships, interactions and networks between all stakeholders that foster entrepreneurship and youth creativity; to encourage entrepreneurship and innovation

among young people from Ruse and other regions of the country and the European Union; To improve the transition from the high-school student bench to the university community;

to establish strong links between the academic community of RU and young people with an innovative spirit and prominent entrepreneurship for joint initiatives related to research projects and practical realization of ideas and concepts; to stimulate the building of stable and mutually beneficial links between young entrepreneurs with innovative spirit and prominent entrepreneurship attitudes with university, business representatives, public authorities and other appropriate organizations. The Expo has already had three editions (2016, 2017, and 2018). The first and second one had over 33 participants from Bulgaria – universities, Bulgarian Academy of science, secondary schools, scientific teams, and clubs. **The edition from 2018 was in the agenda of the EU conference "HEInnovate", 14-16 June, which was hosted by University of Ruse.** The University is among the first in Europe to accept the challenge of joining the **HEInnovate** project as early as 2014 to provide higher education institutions with advice, ideas and inspiration to effectively manage institutional and cultural change for entrepreneurship promotion. To date, more than 800 universities across 5 continents participate in the HEInnovate initiative.



The **Development of innovative products by knowledge exchange, collaboration and entrepreneurial training of young people** is stimulated by several initiatives. One already internationally recognized is the participation of University of Ruse team in the Shell Eco marathon in the last three years (2016 – 2018). The general objective is to encourage students for innovative thinking through knowledge exchange, collaboration and real mechanisms of cooperation. The initiative also assists

interdisciplinary cooperation and stimulates the relations between the University and Business, with the production of the environmentally friendly city car (HydRU-R1). In the period 22-24 September, 2017, HydRU Racing Team of the University of Ruse participated for the first time in the preliminary round of the Shell Eco-marathon – Challenger Event race in Istanbul. This was the newest team of Bulgaria, which was involved in the race. The Committee of Technical Commissioners evaluated highly the quality of the vehicle and its design, with the result that HydRU won the Best Design Award of Shell Eco-Marathon Challenge Event – Turkey 2017. This is an award for both the appearance of the vehicle, and all its components and systems. The impeccable implementation of all the elements is a guarantee for this great success. Bulgaria has been participating in this race for ten years, but this was the first time a Bulgarian team has won such a prize. The team achieved its primary objective – qualification for the finals in London for 2018.



Students are involved in innovations development and building entrepreneurship capacity by different approaches. One example is the **Master class Eco-Entrepreneurship**, organized by the Faculty of Business and Management and Institute for the Study of Societies and Knowledge at the Bulgarian Academy of Sciences, supported by the Institute for Environmental Studies (Heidelberg) and the German Federal Environmental Foundation (DBU). It was organized twice: March – June 2016 and October - December 2016.



In response to the opportunities and challenges of establishing direct contact with business practice, University of Ruse is building a creative solution for an event format entitled "**Day and Night of Entrepreneurship**" - an initiative to support the business spirit and skills of young people. The start of the idea was given on November 11, 2009 when an international educational project STARTENT - Fostering Business-University Partnerships for Entrepreneurship Education in Europe, was won with the participation of the Faculty of Business

and Management. One of the activities to promote youth business initiatives included in it is the organization of European Young Entrepreneurship Awards and their results are then presented at regional events where students and young people are expected to play an active role. Over 130 students from Bulgaria, Romania, Macedonia, Albania, Slovenia, Serbia have participated in the events since 2011. The format "**Day and Night of Entrepreneurship**" was awarded 4th place at the national selection of European Enterprise promotion awards in 2013.

The build-up of competences in entrepreneurship and innovation training has allowed representatives of University of Ruse Faculty of Business and management (11 lectures up to now) to participate in the annual "train the trainer" colloquium of the **European Forum for Entrepreneurship Research** (International Entrepreneurship Development Forum). This enables FBM to work with students to adapt leading learning methodologies through case studies of educational leaders such as Harvard Business School, Cambridge Judge Business School, IESE Business School Navarra, etc.

