



**UNIVERSITY OF PLOVDIV
"PAISII HILENDARSKI"**

**FACULTY OF ECONOMICS AND SOCIAL SCIENCES
DEPARTMENT OF MANAGEMENT AND QUANTITATIVE METHODS
IN ECONOMY**

MEGI ZDRAVKOVA DAKOVA

**INTERACTION OF HIGHER EDUCATION
AND THE INDUSTRIAL ENTERPRISE
IN THE CONDITIONS OF A COMPETITIVE
BUSINESS ENVIRONMENT**

ABSTRACT

of a dissertation for the award of educational and scientific
degree "Doctor"

professional field: 3.8. Economy

doctoral program: Economics and Management (industry)

Scientific Supervisor: Assoc. Prof. Angel Dimitrov, PhD

**Plovdiv
2023**

The dissertation has a total volume of 236 pages. It consists of a list of abbreviations, an introduction, three chapters, a conclusion, recommendations, contributions of the doctoral student, appendices, declaration and bibliography. Contains 39 tables and 6 figures. The literature used includes 138 sources in Bulgarian and English.

The dissertation work was discussed and directed for defence at the departmental council on 16.01.2023 by the Department of “Management and Quantitative Methods in Economics” at the Faculty of Economic and Social Sciences at the University of Plovdiv “Paisii Hilendarski”.

The defence of the dissertation will take place on 22.03.2023 at 11:00 a.m. in the Meeting Hall of University of Plovdiv “Paisii Hilendarski” – Rectorate.

The materials for the defence are available to those interested at the University of Plovdiv “Paisii Hilendarski”, Plovdiv, “Tsar Asen” Str. 24, Department “Development of the academic staff and doctoral studies”.

Scientific jury:

Assoc.Prof. Margarita Ruseva
Prof. Dr. Valentina Nikolova-Alexieva
Prof. Dr. Nelly Bencheva
Assoc.Prof. Mina Angelova
Assoc.Prof. Toni Mihova

Author: Megi Zdravkova Dakova

Title: Interaction of higher education and industrial enterprise in the conditions of a competitive business environment

I. GENERAL CHARACTERISTICS OF THE DISSERTATION

1. Relevance and significance of the dissertation work

The effective interaction between education, science, and business, with the active support of the state, contributes to increasing the development of education and research and development. This leads to the creation of innovations, as well as increasing the competitiveness of the country. Long-term cooperation should be built based on trust, mutual benefits, efficient consumption of resources and creation of quality products. The main goal of **higher education** as a sector of the educational system is the training of specialists, development of science, dissemination of knowledge, skills, and competences. It is related to the development of the country's economy. Education is a long-term process, and its final product is realized in the labour market.

Science connects higher education and the economy. Combining the knowledge and skills gained from education, ideas, and business needs leads to the creation of new ideas and innovations. It is the basis of overcoming a few difficulties and finding good solutions. Defining a sharp vision for its development is a guarantee of economic growth and competitiveness.

The **business** is a user of the scientific potential and the educational product. Business organizations are perceived not just as an investment tool, but as a resource of strategic importance. In search of new opportunities to increase competitiveness, it is necessary for business organizations to interact with educational and scientific institutions.

At the modern rates of development, all this determines the relevance of the research and the importance of the subject of the present dissertation work. It examines the outlined problems and analyses the current state of cooperation between the university and business organizations in Bulgaria. Existing connections and dependencies are investigated using the example of “Paisii Hilendarski” University of Plovdiv.

2. Object and subject of the dissertation work

The object of the study of the current dissertation work is the modern and dynamically developing relationship between the university and the industrial enterprise.

The subject of the dissertation is the set of factors influencing cooperation between the higher education institution and business organizations, as well as the forms and degrees of interaction between them.

3. Aim and tasks of the dissertation

The aim of the dissertation is to investigate the interaction between the university and industrial enterprises.

To realize the presented goal, the following research tasks have been formulated:

1. To make a literature review on the topic of the dissertation, systematizing the main theoretical statements related to the interaction between higher education, science and business.
2. To make an analysis of the current state of research and development in Bulgarian universities, identifying the factors and specific opportunities for cooperation between the university and business organizations.
3. To create a conceptual model for areas of higher education and research activity and assessment of the interaction with business on the example of “Paisii Hilendarski” University of Plovdiv.
4. To examine the connections and dependencies between “Paisii Hilendarski” University of Plovdiv, research centers and business organizations in the South-Central Planning Region.
5. To develop a functioning web-based platform in the university space, ensuring a sustainable connection between education, science, and business.

4. Research hypothesis

The research thesis finds expression in the fact that education, science, and business can successfully cooperate if existing resources are effectively used based on trust and mutual benefits. By implementing an appropriate mechanism, the active participation of the three countries can be stimulated.

A scientific hypothesis:

An effective partnership between education, science and business leads to an increase in the quality of education, strengthening the transfer of knowledge and technology, as well as benefits for business. The developed model is applicable to the higher school. Because of the scientific hypothesis thus presented, the following complementary research hypotheses have been formulated.

5. Methodology of the dissertation work

In the process of working on this dissertation, a combined research strategy was used, which included the application of both quantitative and qualitative methods.

The registration of primary data is realized by means of a survey and an in-depth interview. The survey card is implemented online through the platform of the Faculty of Economic and Social Sciences at “Paisii Hilendarski” University of Plovdiv – *fisn.uni-plovdiv/survey/*, which is web-based.

The in-depth interview is conducted face-to-face with pre-selected respondents and the data obtained from it are entered into a computer. Specialized social research software IBM SPSS, version 26.0 and Microsoft Excel 2019 were used to process the data.

6. Limitations of Dissertation Research

The empirical research in the dissertation is aimed at Plovdiv University “Paisii Hilendarski”, as a leading higher education institution in Southern Bulgaria. The interaction between the University and the industrial enterprise is considered through the prism of innovative project and scientific-applied activity. The university not only produces highly qualified specialists needed in the labour market, but also carries out in-depth research and development activities. The university cooperates in various forms not only with large industrial enterprises, but also with small and medium-sized business organizations. That is why at in the interaction between higher education and business, the industrial enterprise is considered as a business organization.

7. Sources of information provision:

The information sources used in the dissertation are:

- Bulgarian and foreign scientific publications.
- Public data from national and international organizations: national and strategic documents, Ministry of Education and Science, National Statistical Institute, Operating programs such as “Europe 2020”, “Horizon 2020”, “Science and Business for Smart Growth” and other.
- Primary information from the author's empirical research, conducted among representatives directly involved in research and development activities at “Paisii Hilendarski” University of Plovdiv and representatives of business organizations.
- Previous research, periodicals, specialized publications, journals, and Internet information sources.

II. STRUCTURE OF THE DISSERTATION

The dissertation was developed in a volume of 236 pages. Contains 39 of figures and 6 per number of tables. They are quoted 138 number of literary sources in Bulgarian, English, and Internet sources. The thesis consists of a list of abbreviations,

Introduction, three chapters, conclusion, recommendations, contributions of doctoral candidate, applications, bibliography, declarations. Each of the chapters begins with a brief introduction to the topic and ends with a conclusion summarizing the findings. In the individual chapters, the cited literature is underlined. There are 6 applications.

III. SUMMARY OF THE DISSERTATION

In the introduction, the relevance and significance of the researched issues are described, the object, the subject, the purpose, and the tasks of the dissertation are defined. The research hypotheses and sub-hypotheses, the research methodology, as well as the limitations of the dissertation are formulated.

CHAPTER I

THE INTERACTION BETWEEN THE HIGHER SCHOOL AND THE INDUSTRIAL ENTERPRISE – THEORETICAL ASPECTS AND CONTEMPORARY VISIONS

The first chapter has an overview character. It presents the theoretical part of the study. Basic theoretical propositions related to the cooperation between higher education, science and business are systematized. It is considered based on the knowledge triangle model. One of its sides is higher education represented by universities, its second side is science, the third is business. Various modifications of the model are also reported, in which the state and society are added as participants. Thus, from the “triangle” model one moves to the “spiral of knowledge” model.

Several economic categories relevant to all participants are considered: innovation, innovation activity, R&D, technology transfer. European and national strategic documents related to higher education, research and development were analysed. The need for interaction between higher education institutions and industrial enterprises (businesses) is emphasized. The essence of innovation is outlined as a means of bringing higher education, science, and their relationship with business closer together.

1.1. HIGH SCHOOL, SCIENCE AND INDUSTRIAL ENTERPRISE

Higher education is an important economic factor for the construction of a suitable ecosystem for the development of science, which can contribute to the creation of additional opportunities for the exchange of knowledge, skills, and the implementation of innovative technologies. In terms of education, research, innovation and technology, EU member states share common goals and interests. Higher education is a place where knowledge and skills are acquired, the foundation on which the future is built.

It is necessary to adapt education to the dynamic environment and requirements of business environments. From the point of view of the globalization of scientific activity, close cooperation between the university and business is of key importance.

An important aspect for R&D is the transition of higher schools from an educational to a scientific research image, which is necessary to support the development of science. Opportunities are provided to improve the policies and funding opportunities for science in the higher school. The efficiency in using the resources of the industrial enterprise characterizes the strategic potential of the enterprise. Its level is determined by the composition and current state of resources to achieve strategic goals and objectives of the enterprise, as well as to ensure the sustainability of economic systems.¹

¹ Mafrikova M., Vrchotaq J., (2014). Influence of competitive advantage on formulation business strategy, *Procedia Economics and Finance*, Volume12, p.667.

1.2. INTERACTION BETWEEN EDUCATION – SCIENCE – BUSINESS IN THE KNOWLEDGE TRIANGLE

The interaction between higher education and industrial enterprise is considered based on the constructive collaboration between the “triangle of knowledge”, namely “education-science-business”, adding other actors (state and society). The relationship between the university and business organizations is mediated by science and research centres on the territory of the university. Science is a key factor in communication between the two countries. The business is a user of an educational product (specialists, personnel created by education), it uses the scientific research and achievements created in the higher school and research centres to solve technological problems and create innovative products. Through the prism of building a knowledge economy, combining scientific research and innovation, business invests in R&D and strives to create a favourable environment for the development of science.

1.3. KNOWLEDGE AND TECHNOLOGY TRANSFER

Knowledge transfer is seen as a two-way continuous process between creators and users of scientific knowledge. It is also important for science, contributing to the improvement of the qualifications of scientists, as well as the competitiveness of higher education institutions. It is important to note the need to create and generate knowledge.²

Through the technological transfer, a mutual relationship is realized between created and accumulated knowledge and technology for their application in practice. Opportunities for cooperation are created between scientific institutes, higher education, research centres and business organizations, joining their efforts according to their capabilities and expectations.

² Yorgova Ts., (2016). Transfer na nauchno znanie, BAN – Institut za izsledvane na obshtestvata i zna-nieto, Sofia, avtoreferat.

1.4. INNOVATION AND COMMERCIALIZATION

Adopted in 2010, the Europe 2020 ³program emphasizes “three mutually reinforcing priorities” – for smart (knowledge economy), sustainable (competitive economy) and inclusive (high employment economy) growth. At the heart of economic growth is the ability to create knowledge that translates into real economic output. This determines the growing importance of scientific research and innovation for the prosperity and sustainable development of any economy. Universities are mediators of knowledge, and business is a user of this knowledge. Active collaboration between business and universities creates the opportunity to achieve innovation, enabling each element to function successfully.

Science, technology, and the commercialization of their results are one of the main sources of economic development. Building lasting connections⁴ between business organizations and higher education leads to knowledge sharing, creating partnerships and opportunities, stimulating innovation and entrepreneurship.

SUMMARY AND CONCLUSIONS FROM CHAPTER ONE

1. Education contributes not only to the creation of highly qualified personnel, which can be successfully implemented in the labour market, but also serves as a user of such personnel. In universities, knowledge is disseminated, and new ideas are generated, many of which have practical implementation.

2. Science is a prerequisite for scientific progress and acts as an intermediary between education and business. It uses the accumulated knowledge and skills coming from education and turns them into innovations tailored to the needs of the market.

³ Europe 2020, <https://www.strategy.bg/Publications/View.aspx?lang=bg-BG&Id=124>, 02.22

⁴ European Commission, https://ec.europa.eu/education/policies/innovation-in-education/university-business-cooperation_bg, 02.22

3. Business, on the one hand, requires personnel created by universities, and on the other hand, it needs new ideas and technologies generated by science. This makes it an active party in the transfer of knowledge, technology, and innovation.

4. The interaction between higher education, science and business is examined based on the “knowledge triangle” model. Various modifications of the model were also considered, in which the state and society are added as participants. Thus, from the “triangle” model one moves to the “spiral of knowledge” model.

5. Long-term cooperation should be built based on trust, mutual benefits, efficient use of resources and creation of products as a result.

CHAPTER II

STATE OF SCIENTIFIC RESEARCH ACTIVITY IN THE HIGH SCHOOL. CONCEPTUAL MODEL AND EMPIRICAL RESEARCH METHODOLOGY

In the second chapter of the dissertation, the factors, and forms of interaction between higher education institutions and industrial enterprises in Bulgaria are examined. An analysis of the state of research and development in higher education institutions in Bulgaria was made. National programs and strategies for their development were reviewed. A variety of sources of information were used – national and international publications, specialized publications, national strategies, and policies, as well as online tools for statistical data. The importance of the forms and degrees of cooperation between the elements in the “triangle of knowledge” is an increasingly topical topic that is constantly being enriched and expanded. An author's Conceptual Model is presented and a methodology for researching this collaboration is described.

2.1. STRATEGIC GUIDELINES FOR THE DEVELOPMENT OF HIGHER SCHOOLS

There would be a sustainable economy only when highly qualified specialists are trained, which is linked to the level of teaching and the quality of conducting scientific research in universities. Higher education institutions and scientific organizations are linked to the country's economy, while at the same time exerting a profound influence on the labour market. Science is the basis of overcoming many difficulties in business activities and finding effective solutions. For this purpose, good coordination with support from the state, academic and scientific circles is important, which is key to attracting and retaining more young people to a scientific career.

2.2. ANALYSIS OF THE SCIENTIFIC RESEARCH SYSTEM IN BULGARIA

Science has been among the main priorities of every government in Bulgaria in recent years. It can be noted that the cooperation between higher education, scientific organizations and industry has not yet been successfully achieved. Achieving superior results is linked to activity along several priority axes, including R&D and technology, the link between business and education, social communication, lifelong learning, and infrastructure improvement. Bulgarian scientists express a desire for universities to successfully cooperate with business through R&D. The business experiences a lack of human resources with adequate knowledge and skills, according to its needs.

For the implementation of R&D, financial resources are used from several sources – the state budget, business, from abroad and other national sources. In Figure 2.6./98 page from the dissertation funding for the period is presented 2017-2021. Through 2020 г. R&D costs are 1 023.8 million BGN, which 0.85% of GDP versus to 2019, there is a tendency of a slight growth of the investments made in absolute size for the scientific research sector. Through 2021 the costs are with 4.9% more than 2020, which is 1 074.0 million BGN, but as a percentage of GDP it is 0,77%, – with 0,08% points less.

It is noticeable that for 2020 и 2021 foreign sources of funds have the largest share – respectively 38.8% and 40,1%. It is clearly seen that the shares of foreign and state investments are increasing, while those of the “Enterprises” sector are decreasing.

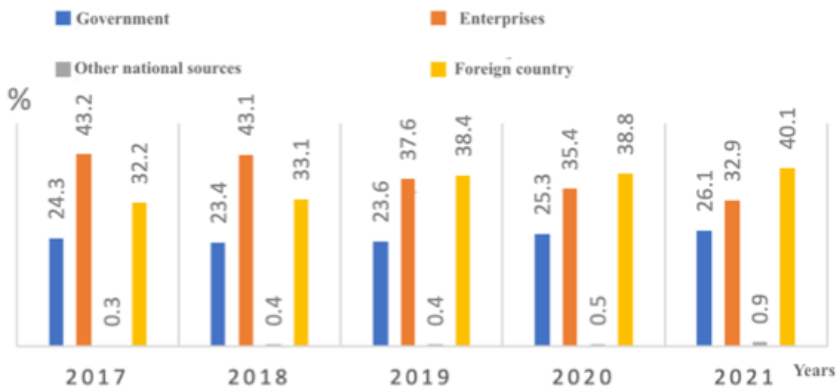


Figure 2.6./98 page from the dissertation
 Structure of R&D expenditures by funding sources to 2021
 Source: NSI⁵

2.3. INNOVATION INDEX AND COMPETITIVENESS OF THE COUNTRY

The innovation policy of the EU places a focus on innovation and is linked to the increase of the country's competitiveness, technology, etc. Of particular importance for increasing the competitiveness of the country is the sustainability and progress of the economy. This is related to the development of R&D, human resources, technology, and infrastructure. In the World Competitiveness Yearbook of the Institute for Management Development, the Bulgarian economy is among the most uncompetitive in Europe (Figure 2.3./94 page from the dissertation). About 2022 г. it ranks on 53 places of 63 countries, while in 2020 borrows 48 places of 63 countries, indicating a lack of progress.

⁵ NSI, https://www.nsi.bg/sites/default/files/files/pressreleases/NIRD_2021_YU9ECA8.pdf, 11.2022

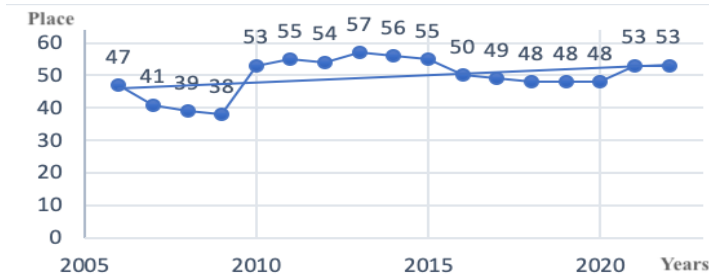


Figure 2.3./94 page from the dissertation
 The development of Bulgaria's competitiveness during the period
 2006-2022

Source: Global Competitiveness 2022⁶

2.4. PRIORITIES IN THE FIELD OF HIGHER EDUCATION AND SCIENCE

The main priorities in the field of education and science are aimed at increasing the quality of education, ensuring equal access, linking curricula with the real needs of business, attracting, and retaining young specialists in science and improving their qualifications. Among the policies and goals are the implementation of systems for evaluation and quality of the academic staff, ensuring good conditions for work in the field of higher education and science.

In 2021, seven universities received the status of scientific research universities for a period of four years, among which is "Paisii Hilendarski" University of Plovdiv. In 2022, three more universities will receive such a status, and the list will be updated annually⁷. This would contribute to the growth of scientists, increase the quality and quantity of scientific production, expand the opportunities for work.

⁶ Tsentar za izsledvane i dmokratsia, Konkurentosposobnost na balgarskata ikonomika 2022, https://csd.bg/fileadmin/user_upload/events_library/files/2022_06/IMD_2022_Press_Release_Bulgaria_BG.pdf , 11.2022

⁷ MON, Nauchnoizsledovateslki universietii, <https://web.mon.bg/bg/news/5093,12.2022>.

2.5. PUBLICATION ACTIVITY

Publications are important not only as a means of disseminating achieved scientific results, but also as a main criterion for academic development, given national requirements⁸ for scientific activity.

In the international rating system SC Imago Institutions Rankings, which considers the research work, innovations, and impact on society by scientific institutions, as of 2022, 13 Bulgarian universities are ranked, of which “Paisii Hilendarski” University of Plovdiv occupies 5th place. In Bulgaria, for the last four years “Paisii Hilendarski” University of Plovdiv continues to be in the top 5 universities. It ranks 5th and 6th respectively on the Scopus and WoS rankings. Table 1 shows the number of publications.⁹

Table 1. “Paisii Hilendarski” University of Plovdiv publications in Scopus and WoS

| | In journal Q1 | In journal Q2 | In journal Q3 | In journal Q4 | Number of citations |
|---------------------------------------|---------------|---------------|---------------|---------------|---------------------|
| Number of publications in Scopus | 72 | 55 | 81 | 109 | Total:630 |
| Total:360 | | | | | |
| Number of scientific publications WoS | 54 | 53 | 15 | 35 | Total:363 |
| Total: 276 | | | | | |

⁸ Prilozhenie 1, Minimalni natsionalni iziskvania za NIRD, https://ncpha.government.bg/uploads/za%20nas/scientific-council/Prilozhenia_08072021.pdf, 11.2022

⁹ Godishen doklad za sastoyaniето i razvitiето na nauchnite izsledvania v nauchnite organizatsii i visshite uchilishta prez 2022.

2.6. STRENGTHS AND WEAKNESSES IN THE COUNTRY'S RESEARCH SYSTEM

The strengths in the field of scientific research in Bulgaria are related to human resources. Despite the lack of sufficient funding in the country, there are active centres and research groups in scientific organizations and in higher schools. Some Bulgarian scientists are leaders in several fields, which is evident from the number of publications in recent years referenced in Web of Science. A prerequisite for overcoming the challenges facing R&D is the interaction between the various institutions. Maintaining the relationship between all participants will contribute to the realization and removal of barriers.¹⁰

Emphasis should also be placed on using the full potential of research and innovation by attracting and retaining young people to science and research. A prerequisite for overcoming the challenges facing R&D is the interaction between different institutions and the use of common resources. Strengthening the relationship between science and business will contribute to the removal of existing barriers.

2.7. METHODOLOGY OF EMPIRICAL RESEARCH

The dissertation uses a combined research strategy that includes the application of both quantitative and qualitative methods. This allows the results of a given study to be checked and supplemented to solve the research tasks.

Questionnaire survey

The questionnaire used in the study consists of 27 questions that do not require the provision of confidential information. The questionnaire contains open-ended and closed-ended questions. The survey is conducted through the method of online surveying with managers of industrial enterprises from the studied population. Of the 61 survey cards sent, responses were received from 57 organizations, which is about 93%, which is the basis for a statistically significant result.

¹⁰ Chobanova, R. (2007). „Ikonomika na znaniето i inovatsii“. Gl, 28, 525-565.

In-depth interview

To specify and supplement the information obtained from the survey with representatives of the industry, an in-depth interview was conducted with representatives of “Paisii Hilendarski” University of Plovdiv, directly involved in research activity. 23 in-depth interviews were conducted, with subsequent statistical processing (decoded) and summarization of the results. They have a different number of questions, pre-selected for each participant. Interviews were conducted by the PhD student using the face-to-face method, with respondents giving prior consent to recording using an appropriate device and taking notes.

2.8. CONCEPTUAL MODEL OF AREAS OF INTERACTION BETWEEN THE UNIVERSITY AND THE INDUSTRIAL ENTERPRISE

In the current dissertation, an author's Conceptual Model for establishing the process of interaction between higher education and industry is proposed. The model is presented in two parts:

- Areas of interaction between higher education institutions and business,
- Indicators for evaluating the results of cooperation between HEIs, business organizations and R&D.

The conceptual model emphasizes the need to adapt education to the needs of the market. Through an effective connection between education, science and business, better practical training of students will be achieved, curricula will be updated, infrastructure will be modernized. Figure 2.14./116 pages of the dissertation presents a diagram of a conceptual model of the study and the various areas of interaction between the Higher Education Institution and the business in the process of their cooperation. In the framework of the conceptual model, indicators for evaluating the results of their activity are presented. Figure 2.15./117 pages of the dissertation presents a scheme of a system for evaluating the results of cooperation between HEIs, business organizations and R&D.

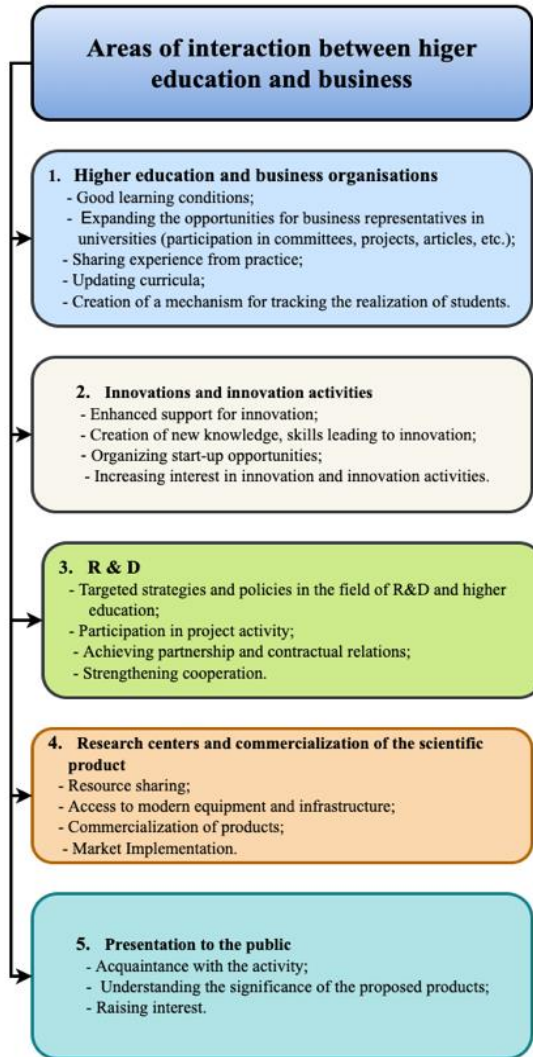


Figure 2.14./116 pages from the dissertation
A conceptual model presented by areas of interaction between higher education, science, and business organizations in the process of their cooperation

Source: Author's interpretation

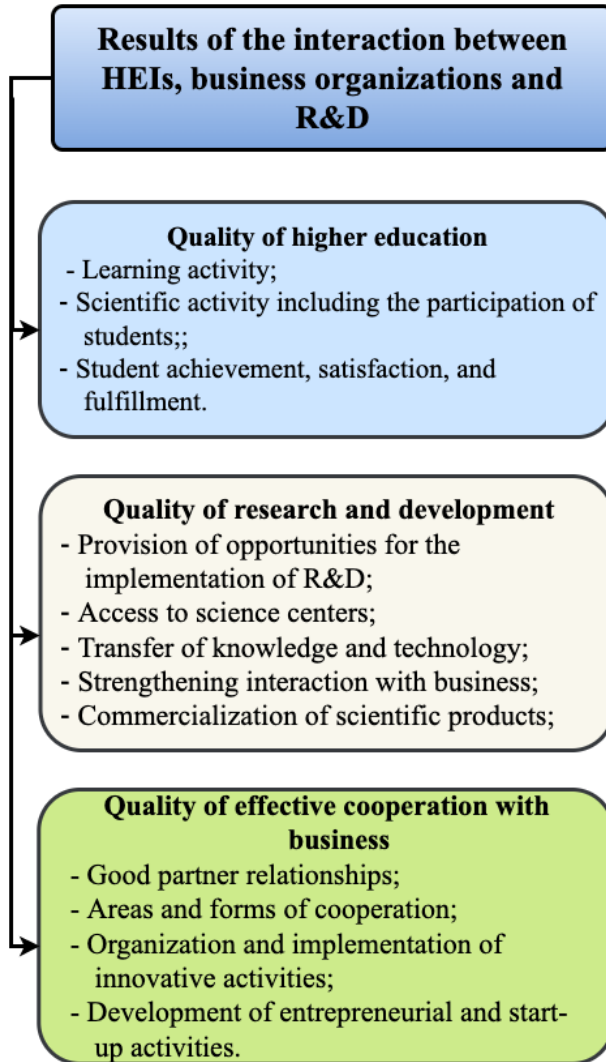


Figure 2.15/117 pages from the dissertation
A scheme for measuring the results of the interaction between HEIs,
business organizations and R&D.

Source: Author's interpretation

SUMMARY AND CONCLUSIONS FROM CHAPTER TWO

1. It is imperative to stimulate sustainable links between the higher education institution and the industrial enterprise to improve the training and practical opportunities of the students for a real working environment. An effective mechanism for tracking the professional development of graduate students is needed.

2. There is a lack of stable connection between higher education and business in Bulgaria. This requires improving the training and practical opportunities of students for a real work environment.

3. It is necessary to stimulate publication activity in scientific publications indexed/referenced in Scopus or Web of Science.

4. According to the international and national rating system in terms of publication activity and research activity, “Paisii Hilendarski” University of Plovdiv is represented very well. It ranks among the five best universities in Bulgaria and is among the first to receive the status of a research university.

5. The problems that make our country uncompetitive are lack of sufficient investment in R&D and insufficient financial capital necessary for the development of enterprises, low level of innovation and poor infrastructure.

6. An author's conceptual model of the process of interaction between higher education and the industrial enterprise is presented. Its two parts have been developed separately, by areas of interaction and indicators for evaluating the results of cooperation.

CHAPTER III

AN INTEGRATED EXPERIMENTAL APPROACH TO RESEARCH INTERACTION BETWEEN THE HIGHER SCHOOL AND INDUSTRIAL ENTERPRISES

The third chapter presents and analyses the results of an empirical study conducted on the interaction between higher education, science, and industrial enterprises on the example of “Paisii Hilendarski” University of Plovdiv. The research is based on conducted surveys and interviews. An author's web-based platform was also developed, offering the possibility of effective interaction between education (and science) and industrial enterprise (business organizations). It enables direct contact between representatives of educational institutions, science, and business.

3.1. SURVEY RESULTS

The most important results of the conducted survey aimed at the industrial sector and business organizations are presented and analysed. Surveys were received from 57 persons who are representatives of various positions in enterprises, institutions, business organizations, municipalities and others who cooperate (about 80%) in some way with “Paisii Hilendarski” University of Plovdiv or are in the process of establishing such relationships (20%). Some of the results are:

Most of the surveyed representatives of enterprises (91%) answered that innovative activities were undertaken in their business organizations. They are willing and ready to create and implement innovations. From additional questions, it is specified

that about 80% of the respondents are representatives of industrial enterprises, and the remaining about 20% – of other business organizations. The largest percentage – 30% are representatives of large companies, 19% – small and others.

From the analysis of the results obtained from the survey, almost half of the respondents indicated that individual business organizations work with research centres of their choice, and others that the connection between business and science is either weak or absent. This result corresponds to the answers to previous questions. The conclusion is that sustainable cooperation and long-term relationships have not been established. The lack of incentives and funds is indicated as the main reason hindering the cooperation between business and science. Small and medium-sized businesses are not ready to fully invest in science if they are not sure that they will earn more funds than they invested, because they are worried about potential losses. It should be noted, however, that more than half of the surveyed business representatives answered that they were familiar with the programs to stimulate cooperation between business and higher education institutions, and about a third – they were not familiar. Business organizations that are familiar with programs to stimulate cooperation have undertaken such activities. They rely on clear rules and correctness on both sides.

Most of the business accepts the need for innovation and is ready to invest in scientific activity, but another part of business representatives is uncertain and hesitant. This is a positive trend and requires active work in the direction of science-business cooperation.

It turns out that larger enterprises are ready to invest funds in R&D, but with clear conditions for cooperation in advance. It is

assumed that they have greater financial capabilities and potential than specialists to invest in development activity.

Businesses want certainty in the bottom line and a guarantee of profit because they are worried about losing funds and resources. This is imposed as the main reason for the weak and unsustainable cooperation with scientific and educational centres.

Regarding the evaluation of the effectiveness of the cooperation with the “Paisii Hilendarski” University of Plovdiv, a greater part of the respondents indicate that they are satisfied and give a high and particularly good rating. This leads to sustainability of the already created connections and is a prerequisite for future initiatives. The questionnaire survey with the representatives of the business gives a clear answer to the questions concerning the reasons that complicate the process of its cooperation with science. Regarding the effectiveness, benefits and barriers to cooperation, the following general conclusions can be drawn:

1. Incentives from the state level are needed for participation in innovative activities and readiness to work with scientific and educational institutions.

2. There is insufficient trust and the need to join forces for successful cooperation between science and business.

3. It is noticed that the business experiences a lack of information about opportunities and activities for the implementation of such cooperation.

4. Industrial enterprises and business participants note that information about scientific developments does not reach them.

5. However, there is an aspiration to create good conditions for participation in joint scientific developments to realize innovative products and technologies necessary for business.

3.2. RESULTS OF THE IN-DEPTH INTERVIEW

To realize the set research goals of the dissertation, in addition to the survey described above, 23 in-depth interviews were conducted with representatives of all units engaged in R&D and occupying a management position in the educational institution “Paisii Hilendarski” University of Plovdiv.

Its main purpose is related to finding answers to questions that cannot be asked in a survey card. They require more in-depth and comprehensive answers, expression of opinions, positions, and attitudes.

The conducted in-depth interviews clarified many of the reasons hindering the interaction between science, business, and education. The representatives of science and education clearly state:

1. There is particularly good cooperation, in various forms, between business and University units.

2. It is emphasized that for each research group joint activities are specific, and the success of cooperation is built based on trust.

3. There is a need to modernize the available material infrastructure and information security.

4. To implement R&D, it is recommended to strengthen the publication activity and international recognition of our scientists.

5. It is necessary to clarify the possibilities of educational institutions and the expectations of business organizations. At the university, basic knowledge is given, basic practical skills are obtained, and their specific implementation depends on the real business environment.

6. It is necessary to clarify the possibilities of educational institutions and the expectations of business organizations. At the university, basic knowledge is given, basic practical skills are obtained, and their specific implementation depends on the real business environment.

3.3. WEB-BASED PLATFORM FOR EFFECTIVE COOPERATION BETWEEN HIGHER EDUCATION AND BUSINESS

Presented and authored web-based platform in the university space, developed for the needs of the Faculty of Economic and Social Sciences, providing the following opportunities:

- direct contact between students and business organizations, which is a prerequisite for a successful career,
- direct communication between students, teachers and business specialists, exchange of ideas, consultations, sharing of experience,
- tracking the realization of graduated students.

Business, science, and higher education in Bulgaria need reforms, which must be tailored to the needs of the labor market and the good training of personnel. Communication between them is an effective factor both for the successful realization of students and for the transfer of knowledge. It is necessary to work in the direction of creating a sustainable relationship between the countries.

Product realization is closely related to the search for ways to support professional orientation and realization. It provided an opportunity for students to share information related to their studies, language culture, professional experience, and on the other hand businesses will describe their expectations and requirements.

3.4 GOOD PRACTICES AT “PAISII HILENDARSKI” UNIVERSITY OF PLOVDIV.

In the "Paisiy Hilendarski" University of Plovdiv, numerous scientific studies are conducted in over 50 international, national, and university projects, including those for improving the information infrastructure (with innovative technologies and tools for training and management). The dissertation presents projects acting in the direction of establishing partnerships and good relationships between other higher education and business.

SUMMARY AND CONCLUSIONS FROM CHAPTER THREE

1. The representatives of science and education clearly indicate that there is good cooperation between business and University units. Due to the specificity of each research group, joint activities with business are realized in different forms.

2. In connection with R&D, it is recommended to strengthen the publication activity and international recognition of scientists. The need to modernize the available material infrastructure, scientific equipment and information security is considered.

3. The business is ready to varying degrees to invest in R&D, under clear conditions and mutual benefits. Small and medium-sized businesses are not sufficiently familiar with the possibilities and activities of cooperation. In general, however, he expects from science a guaranteed result – finished end products and innovative technologies to be implemented.

4. Good practices of “Paisii Hilendarski” University of Plovdiv are described. It is established that the training of the students is carried out by highly qualified teachers who are actively involved in research and development activities. Numerous successful projects have been implemented in cooperation with various business organizations.

5. In the third chapter, an author's web-based platform in the university space, developed for the needs of the Faculty of Economic and Social Sciences at “Paisii Hilendarski” University of Plovdiv, is presented.

CONCLUSION

In the concluding part of the dissertation, the results of the conducted research are summarized and its contributions to increase the effectiveness of the cooperation between the university and the industrial enterprise, examined through the prism of science, are brought out.

The following more important conclusions can be formulated in the dissertation work:

1. An extensive literature review was made about the dissertation. Based on the “knowledge triangle” model, the cooperation between its three sides – “education-science-business” is examined.

2. An analysis of the state of research and development in Bulgarian universities was made. National and international publications, data from national and European documents and online statistical tools were used.

3. In the dissertation, an author's conceptual model for the study of the relationship between the university and business organizations is proposed, including areas of interaction and evaluation indicators. The implementation of this model will contribute to building sustainable and long-term cooperation between them, leading to economic growth.

4. According to the international and national rating system for publication and research activity, “Paisii Hilendarski” University of Plovdiv is represented very well. It is among the first to receive the status of a research university, which is a prerequisite for more significant scientific production. From the presented good practices in project activity, numerous successfully implemented projects in cooperation with business organizations are clearly visible.

5. In the present work, the connections, and dependencies between “Paisii Hilendarski” University of Plovdiv, research centres and various business organizations are investigated. The results of a survey conducted with representatives involved in

research and development at “Paisii Hilendarski” University of Plovdiv and specialists from business circles are presented.

6. According to the representatives of science and education, there is incredibly good cooperation between business and University units. Due to the specificity of each research group, joint activities with business are realized in different forms. Business emphasizes the need for direct and wider contact with scientific potential and students.

7. The dissertation presents a developed author's web-based platform in the university space. It helps to overcome communication barriers and provides a sustainable link in cooperation between education, science, and business. It is possible to implement the platform for all professional areas in the university network.

The relevance of the present dissertation is confirmed by the above conclusions. The results presented so far correspond and satisfy the set goals and objectives, research thesis and scientific hypothesis.

DISSERTATION CONTRIBUTIONS

Contributions of a theoretical-methodological nature:

1. Based on an extensive literature review, an in-depth theoretical analysis of the interaction between higher education, science and industrial enterprise has been made.

2. Based on numerous normative and strategic documents, an analysis of the state of research and development activity in higher education in Bulgaria for the period 2017-2021 has been made.

3. An author's Conceptual model for the development of cooperation between the university and business organizations in areas of interaction and evaluation indicators is proposed.

Contributions of a scientific and applied nature:

1. The connections and dependencies between “Paisii Hilendarski” University of Plovdiv, research centres and business organizations on the territory of the South-Central Region were studied. An independent empirical study was conducted with representatives from “Paisii Hilendarski” University of Plovdiv and specialists from the business environment. The analysis of the obtained results shows the presence of specific sustainable relationships in some professional areas and the absence of such in others.

2. The good practices at the university are systematized, presenting some of the most significant active projects in the direction of establishing stable partnership relationships between other higher education institutions and numerous business organizations.

3. An author's web-based platform in the university space is presented, which enables direct contact between students and business organizations, communication between current and graduate students to exchange ideas, consult, share experience.

PROSPECTS FOR DEVELOPMENT

1. To expand and enrich the known and to propose new effective approaches in the direction of improving the cooperation between education, science, and business.

2. Expanding the scope of research – adding new participants in the interaction between the university and business organizations, for example – society.

3. Offering new and innovative approaches in the process of achieving trust and sustainability in the relationships between the participants.

4. Creation of electronic information resources.

5. Upgrade of the proposed web-based platform and the possibility of its implementation in other units of the higher school.

LIST OF PUBLICATIONS ON PhD THESIS

1. **Dakova, M.**, “Nauchnoizsledovatel'skata deynost na visheto uchilishte kato faktor za povishavane na inovatsionnata aktivnost”, Parva natsionalna nauchna konferentsia za studenti, doktoranti i mladi ucheni, Inovatsii i konkurentosposobnost, ISSN: 2738-7534, 2020, s. 143-152.

2. **Dakova, M.**, Dimitrova, G., Dimitrov, A. “Predizvikelstva pred satrudnichestvoto mezhdu nauka, obrazovanie i biznes”, Sbornik s dokladi ot Yubileyna mezhdunarodna nauchna konferentsia “Ikonomicheska i sotsialna (dez)integratsia”, ISBN 978-619-202-565-6 (print), ISBN 978-619-202-566-3 (e- book), s. 571-586.

3. **Dakova, M.**, G. Dimitrova, “Inovatsionni strategii i politiki za izgrazhdane na ustoychiva vrazka mezhdu nauka, obrazovanie i biznes”, SUB – Plovdiv, s. 26 – 30, ISSN 1311.9400.

4. Dimitrova, G., **Dakova, M.**, Dimitrov, A. “Tehnologichen transfer – predizvikelstva i perspektivi pred Visshite uchilishta”, Ikonomicheska nauka, obrazovanie i realna ikonomika: razvitie i vzaimodeystvia v digitalnata epoha, Izdatelstvo “Nauka i ikonomika”, IU Varna, t. 1, 2020, ISBN 978-954-21-1037-8, s. 520-531.

5. **Dakova M.**, “Vnedryavane na inteligentna sistema za postigane na ustoychiva vrazka v obrazovaniето, naukata i biznesa”, Nauchni trudove na SUB – Plovdiv, seria B. Estestveni i humanitarni nauki, t. HXII, s. 31-35, ISSN 1311-9192 (Print), ISSN 2534-9376 (Online).

6. **Dakova M.**, Dimitrova G., “R&D – Profila na izsledovatelya i publikatsionnata aktivnost na visshite uchilishta”. Nauchni trudove na SUB – Plovdiv, seria B. Estestveni i humanitarni nauki, t.XX, ISSN:1311-9192 (Print), issn:2534-9376 (Onlain).

BIBLIOGRAPHY

1. Europe 2020, <https://www.strategy.bg/Publications/View.aspx?lang=bg-BG&Id=124>, 01.23
2. European Commission, https://ec.europa.eu/education/policies/innovation-in-education/university-business-cooperation_bg, 02.22
3. Chobanova, R. (2007). "Ikonomika na znaniето i inovatsii". Gl, 28, 525-565.
4. Godishen doklad za sastoyaniето i razvitiето na nauchnite izsledvania v nauchnite organizatsii i visshite uchilishta prez 2022.
5. Mafrikova M., Vrchotaq J., (2014). Influence of competitive advantage on formulation business strategy, Procedia Economics and Finance, Volume12, p.667.
6. MON, Nauchnoizsledovateslki universieti, <https://web.mon.bg/bg/news/5093>, 12.2022,
7. NSI, https://www.nsi.bg/sites/default/files/files/pressreleases/NIRD_2021_YU9ECA8.pdf, 11.2022
8. Tsentar za izsledvane i dmokratsia, Konkurentosposobnost na balgarskata ikonomika 2022, https://csd.bg/fileadmin/user_upload/events_library/files/2022_06/IMD_2022_Press_Research_Bulgaria_BG.pdf , 11.2022
9. Prilozhenie 1, Minimalni natsionalni iziskvania za NIRD, https://ncpha.government.bg/uploads/za%20nas/scientific-council/Prilozhenia_08072021.pdf, 11.2022
10. Yorgova Ts., (2016). Transfer na nauchno znanie, BAN – Institut za izsledvane na obshtestvata i znaniето, Sofia, avtoreferat.

ACKNOWLEDGMENTS

First, I express my most sincere thanks to my scientific supervisor, Assoc. Dr. Angel Dimitrov, for the vote of confidence in me, the opportunity provided, an inspiring example, and for his continuous support!

I thank Assoc. Dr. Margarita Ruseva for her comprehensive assistance and dedicated support.

I express my special thanks for the professional support and consultations of Prof. Dr. Nevena Mileva and the colleagues from NPD, as well as ch. assistant professor Dr. Gergana Dimitrova.

I thank all colleagues from the Department of “Management and Quantitative Methods in Economics” at FISN at “Paisii Hilendarski” University of Plovdiv. who in one way or another assisted in the realization of this work. I also thank Prof. Dr. Dragomir Genov for the support and guidance given.

Finally, I thank my family who always support me in all my endeavors!

I am grateful that during these few years I had the opportunity to do what I love, and the product of this action is this dissertation!

I dedicate this work to my sons Dimitar Dakov and Konstantin Dakov!