



**BUSINESS ANALYTICS
SKILLS FOR THE
FUTURE-PROOF
SUPPLY CHAINS**

**SUMMARY
OF SELECTED
SURVEY
RESPONSES
OF
TEACHERS,
STUDENTS
AND
GRADUATES
OF THE
UNIVERSITY**

BAS4SC Project Team



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1. Students and graduates

- A total of 464 students and university graduates participated in the study. The breakdown of respondents by country is shown in Chart 1. 70% of them were students and graduates of universities in Poland.

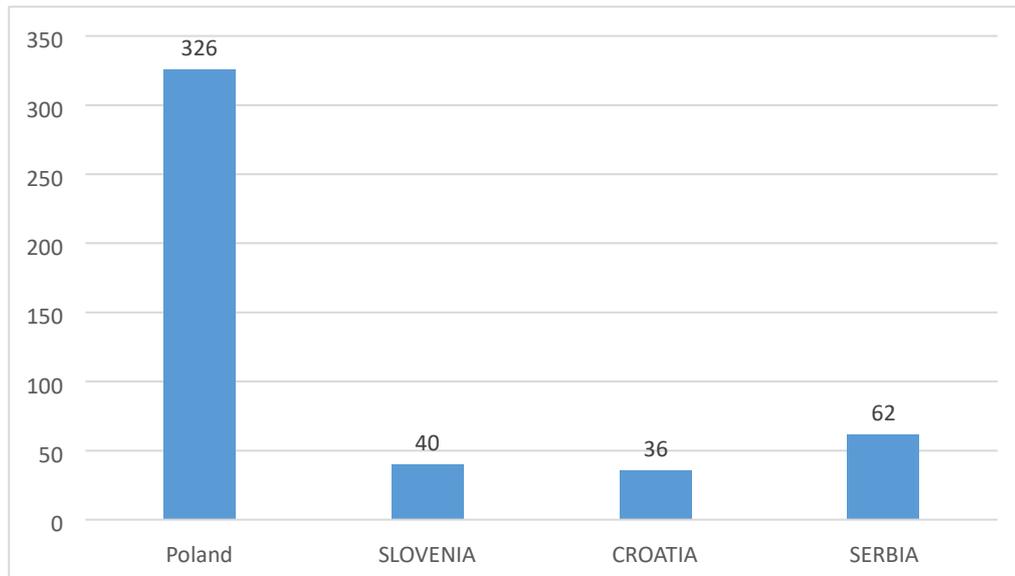


Chart 1. Participation of students and graduates in the survey by country

- A total of 326 students from Poland participated in the study during first or second cycle studies in the fields of Logistics (88.7%), Management (10.4%) and Engineering or related fields (8.6%), and graduates (21.4%).
- A total, of 40 students from Slovenia participated in the study during first or second cycle studies in the fields of logistics (100%).
- In total, 36 students from Croatia participated in the study during first or second cycle studies in Marketing (44.4%), Economics (22.2%), Logistics (16.7%), Management (16.7%) and Engineering (13.9%) and graduates (8.4%).
- In total, 62 students from Serbia participated in the study during first or second cycle studies in the fields of Engineering (96.8%) and Logistics (3.2%) and graduates (1.6%) participated in the study.
- The study confirms the need to broaden the knowledge and development of BAS competences of young people. As many as 83% of young people have no



competence in this area. Only 14% of students and graduates encountered the issue during classes and subject courses at universities (Chart 2).

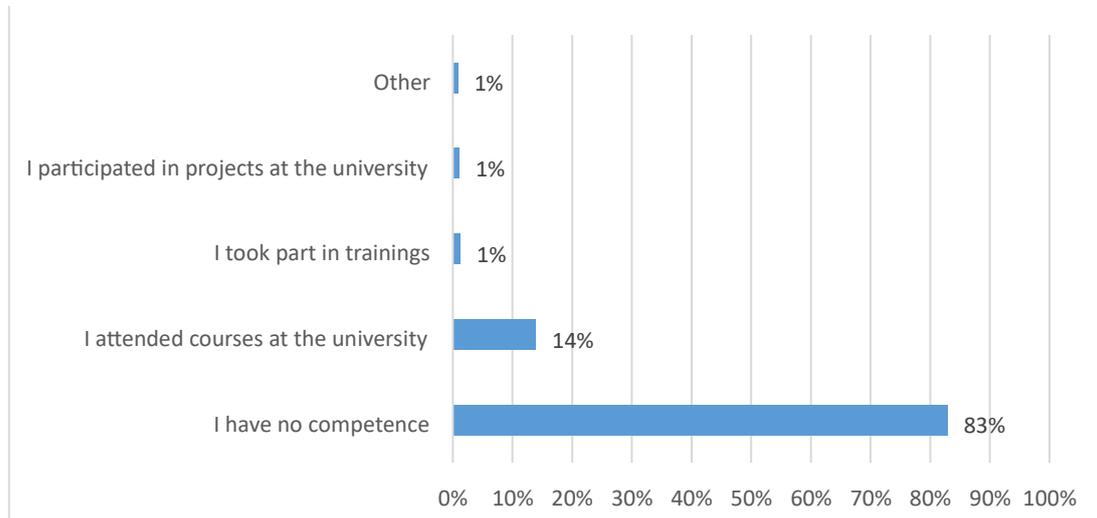


Chart 2. BAS competencies held in the surveyed sample

- A detailed list of respondents' statements by country is presented in the following charts 3-6.
- Among the respondents from Poland, as many as 96% of the surveyed young people state that they do not have competences in the field of BAS. Only 2% indicated that they had a chance to acquire competences during didactic classes at the university, and 1% each that they participated in a project or took part in training on this subject (Chart 3).

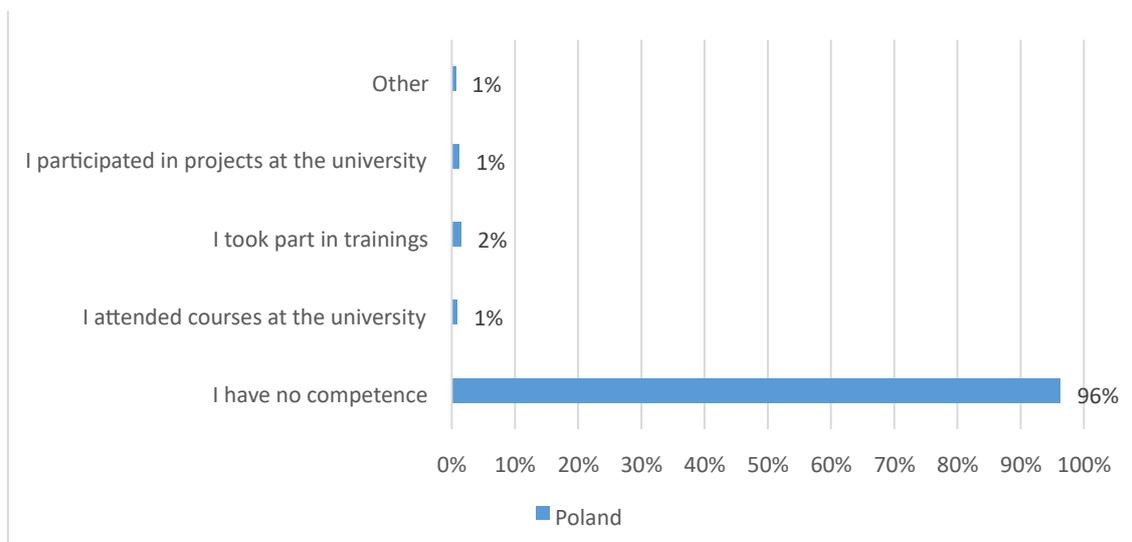




Chart 3. Indications of students and graduates from Poland regarding the possession of BAS competencies

- Among the respondents from Slovenia, as many as 98% of the surveyed young people state that they do not have competences in the field of BAS. Only 3% indicated that they had a chance to acquire competences during didactic classes at the university (Chart 4).

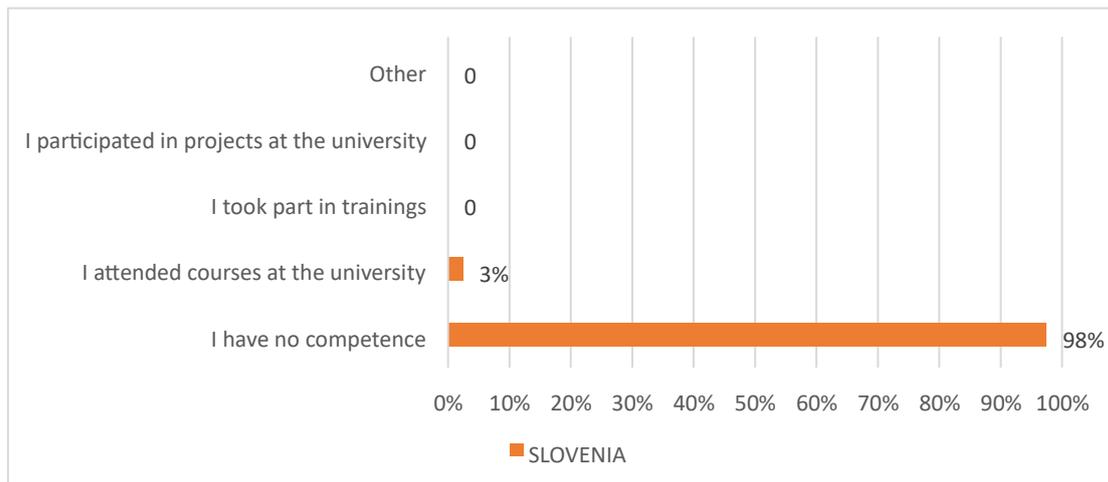


Chart 4. Indications of students and graduates from Slovenia regarding the possession of BAS competencies

- Among the respondents from Croatia, 72% of the young people surveyed state that they do not have BAS competences. 19% of respondents indicated that they had a chance to acquire competences during didactic classes at the university. 3% of respondents indicated that they had participated in the project or had taken part in training on this subject (Chart 5).

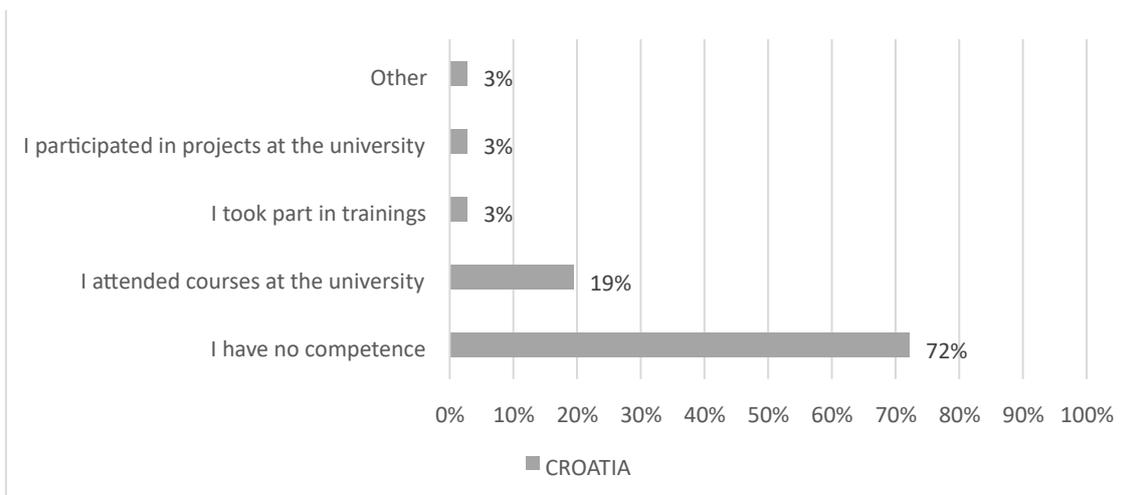


Chart 5. Indications of students and graduates from Croatia regarding the possession of BAS competencies

- Among the respondents from Serbia, 13% of the young people surveyed state that they do not have BAS competences. As many as 87% of respondents indicated that they had a chance to acquire competences during didactic classes at the university (Chart 6).

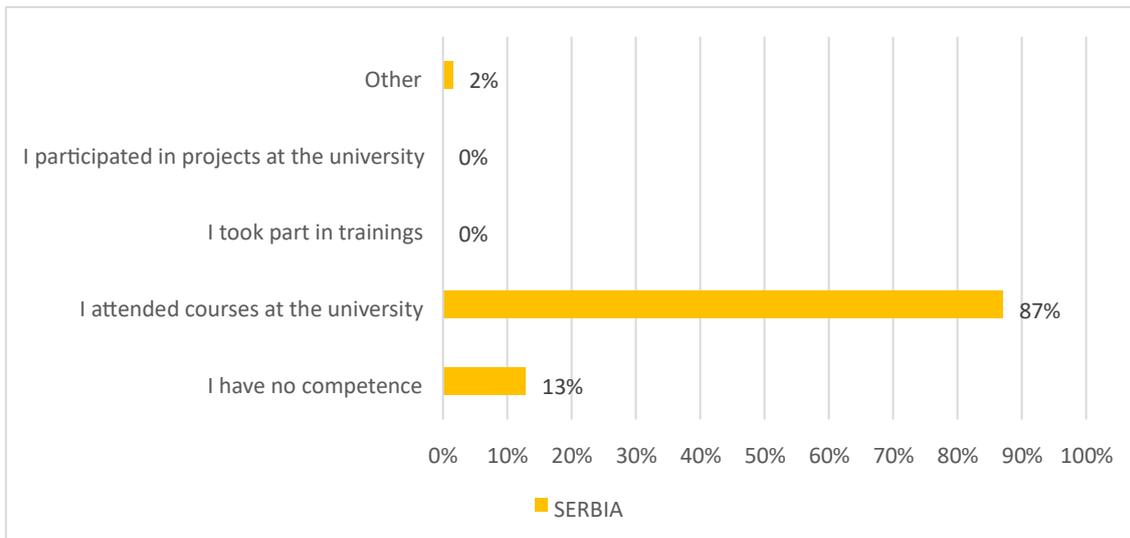


Chart 6. Indications of students and graduates from Serbia regarding the possession of BAS competencies



2. Academic teachers

- A total of 108 academic teachers participated in the study. A detailed breakdown of academic teachers by country is presented in Chart 7.

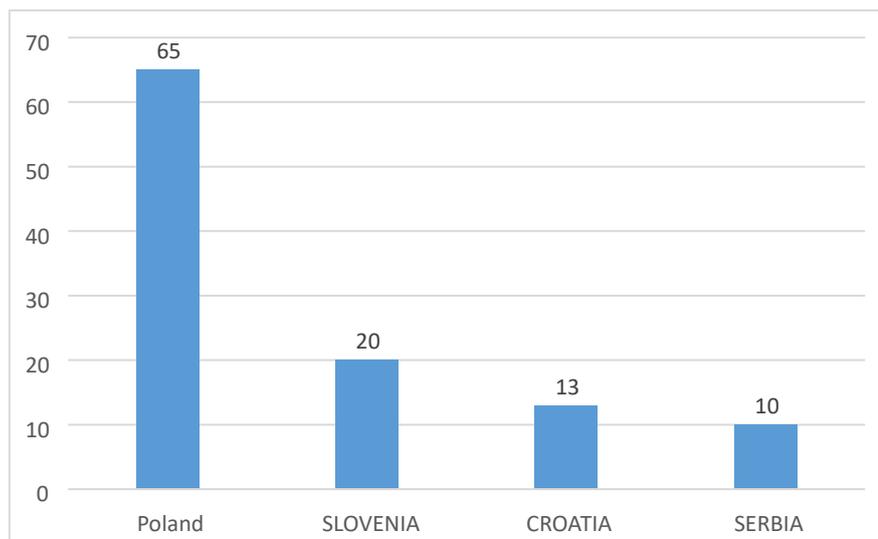


Chart 7. Participation of academic teachers in the survey by country

- Academic teachers from Poland participated in the study: master's degree (21.5%), doctor (60%), associate doctor (18.5%). First of all, with engineering education (43.1%) and economics (26.2%). They mainly teach subjects in the field of Logistics (73.8%) and Management (58.5%).
- Academic teachers from Slovenia participated in the study: doctor (75%) and master's degree (20%); with engineering education (30%), social sciences (30%) and



economics (20%). They mainly teach subjects in the field of Logistics (60%) and Management (30%).

- Academic teachers from Croatia participated in the study; dominated by employees holding the position of doctor (46.2%), with economic education (100%). They mainly teach subjects in the field of Logistics (76.9%) and Management and Economics (46.2% each).
- Academic teachers from Serbia participated in the study; doctor (80%) and master's degree (20%); with an engineering education (100%). They mainly teach subjects in the field of Logistics (80%) and Engineering (20%).
- The surveyed academic teachers from Poland claim that they do not have BAS competencies (54%), and 25% have participated in training on the researched topic. Only 5% of respondents indicated that they had a chance to acquire competences during didactic classes at the university (Chart 8).

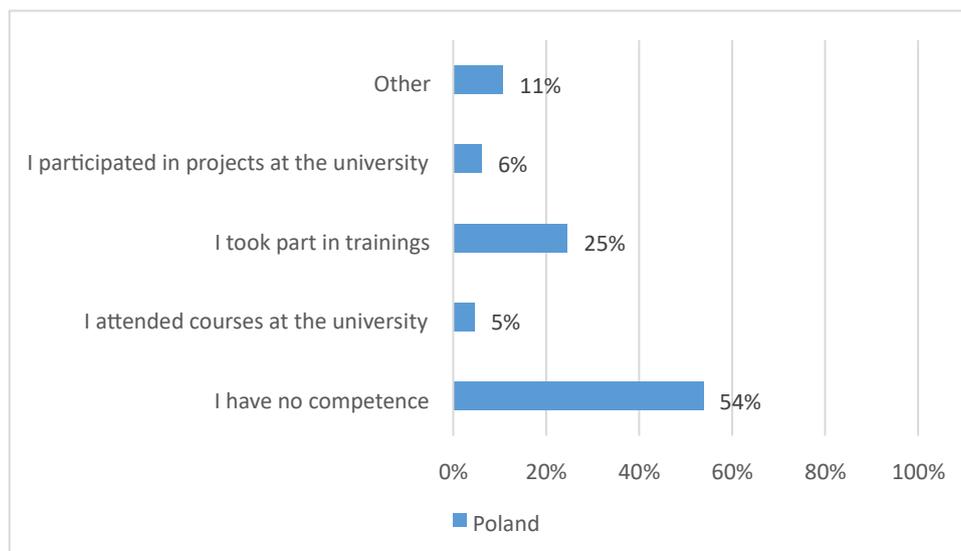


Chart 8. Indications of teachers from Poland regarding the possession of BAS competencies

- The surveyed academic teachers from Slovenia claim that they do not have BAS competences (50%), and 10% have participated in projects on this subject and training at the university (15%) (Chart 9).

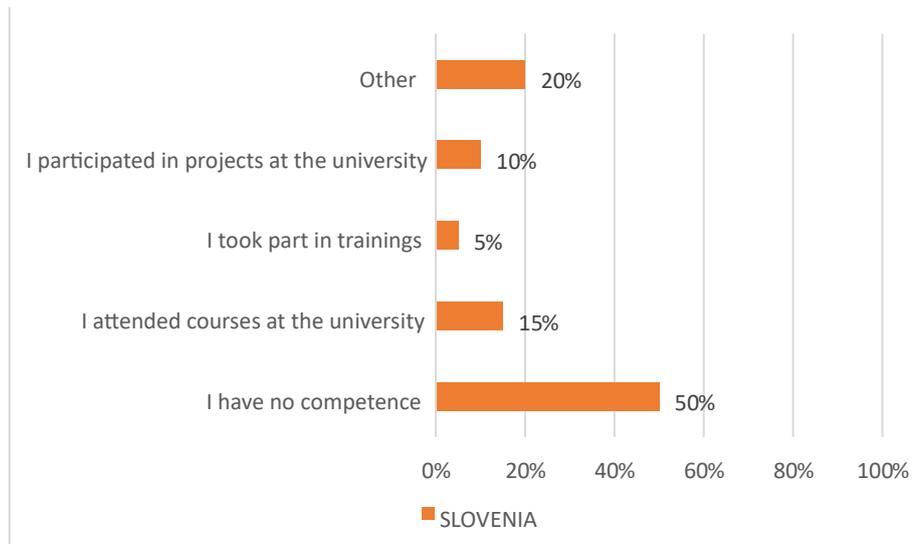


Chart 9. Indications of teachers from Slovenia regarding the possession of BAS competencies

- The surveyed academic teachers from Croatia claim that they do not have BAS competences (23%), and 54% had the opportunity to participate in training in this subject at the university (Chart 10).

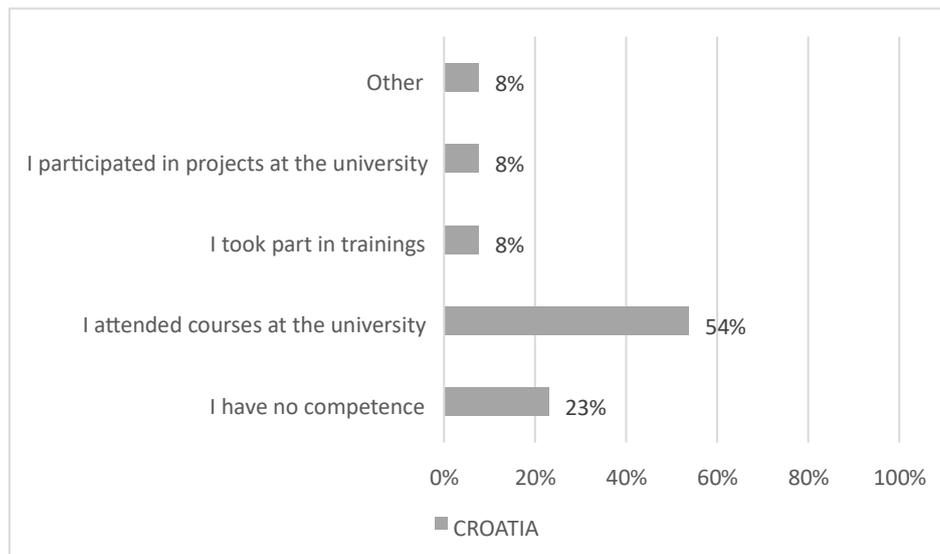


Chart 10. Indications of teachers from Croatia regarding the possession of BAS competencies

- The surveyed academic teachers from Serbia claim that they do not have BAS competences (20%), and 70% had the opportunity to participate in projects on this subject and training (10%) (Chart 11).

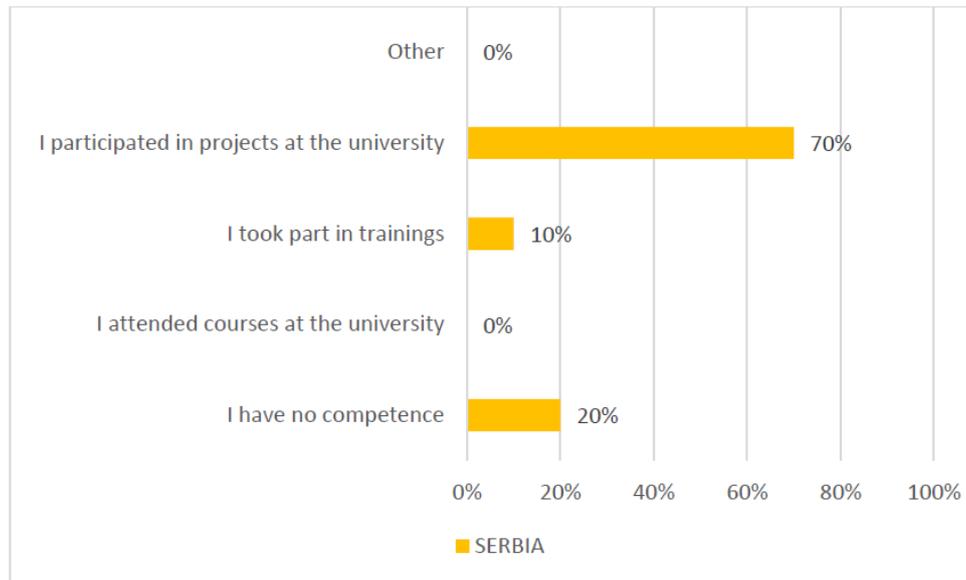


Chart 11. Indications of teachers from Serbia regarding the possession of BAS competencies



3. Competence needs analysis

The competency assessment was conducted among both students (including graduates) and academic staff. The list of competencies examined was derived from the analysis of the educational programs analyzed as part of Task A2.1 of WP2. The list of competencies examined:

- Forecasting Techniques
- Business Data Analytics
- Statistics for Business Analytics
- Sampling and Experimental Design
- Spatial Statistics
- Data Ethics and Data Security
- Stochastic Simulation
- Optimization in Supply Chain Management
- Optimization models and heuristic methods for managing production systems
- Vehicle routing
- Heuristics in analytics
- Last Mile Delivery: data analytics and models
- Game theory applied in logistics
- Lean Six Sigma Statistical control
- Data Visualisation Methods
- Creation of Reports and Dashboards
- Spreadsheet analysis
- Big Data Research Methods
- Big Data Systems
- Software tools in logistics
- Microsoft Excel
- Data analysis and R software packages
- Data mining
- Social Network Analysis
- Python for Data Science
- Business Analytics Foundations including R, SQL, and Power BI software
- Statistical data processing SPSS
- Statistical Data processing SAS EG
- Data Mining and Data Warehousing
- Designing the databases
- SQL
- Software tools for data management
- Enterprise Resource Planning Systems (ERP)
- Integrated enterprise management (SAP, ERP)
- IoT and SCADA Technologies
- Data protection
- Information security
- Systems for automatic identification (RFID, barcodes)
- Blockchain Technologies



- General programming
- Artificial Intelligence and Machine Learning
- Software tools in logistics
- GIS in logistics
- Discrete event simulation
- Stochastic Modeling
- Business Process Modelling
- Simulation of Logistics and Supply Chains
- Agent-based modelling and simulation
- Power BI
- Tableau
- Principles of Microeconomics
- Principles of Macroeconomics
- Data Management and Business Intelligence
- Data Security Management
- Knowledge Management
- Controlling in Supply Chain Management
- Supply Chain and Sourcing
- Supply Chain Risk Management
- Mathematical models for Supply Chain Management
- Inventory Management
- Outsourcing (Make of Buy)
- e-logistics
- Information Systems & Business Process Management
- Quality management
- Sales and service management
- Lean Management
- Six Sigma Techniques
- Strategic Analyses
- Cost-Benefit Analysis for Business
- Econometrics
- Digital economics
- Inference fuzzy
- Neural networks
- Decision trees
- Pattern recognition
- Genetic algorithms
- Latent Dirichlet Allocation algorithm
- Latent Semantic Analysis
- Discovering regularities in data
- Understanding and interpreting the data
- Advanced Mathematics for Decision Making
- Game Theory
- Operations Research
- Optimization Methods and Tools
- Combinatorial optimization and metaheuristics



- Large Scale Optimization
- Integer Programming
- Network Optimization
- Transport Optimization
- Optimization using metaheuristics
- Algorithm design
- Introductory statistics
- Statistics for Business Analytics
- Correlation analysis
- Multivariate analysis
- Hypothesis testing
- Linear Regression with Single and Multiple Regressors
- Dynamic Simulation of closed-loop systems
- Modelling and Simulation of Dynamic Systems
- Complex Systems
- Process analysis and Petri nets

The competency test was aimed at:

- A survey conducted among students (including graduates) – determining whether a given competency was implemented as part of the study program and to what extent (only theoretical knowledge or also practical skills);
- A survey conducted among academic teachers – identifying the importance of individual competencies according to academic teachers, divided into knowledge of the content and the ability to apply it in practice.

The results of the competency study are presented in:

- survey conducted among students (including graduates) – Attachment 1_BAS4SC_WP2_Students – sheet Analysis_S_ALL;
- survey conducted among academic teachers – Attachment 2_BAS4SC_WP2_Teachers – sheet Analysis_T_ALL.

A detailed analysis of the results of the research conducted among students and graduates, broken down by country, was presented in: Attachment 1_BAS4SC_WP2_Students:

- Polska – results in the spreadsheet: Analysis_S_PL;
- Chorwacja – results in the spreadsheet: Analysis_S_HR;
- Slovenia – results in the spreadsheet: Analysis_S_SI;
- Serbia – results in the spreadsheet: Analysis_S_SR.

A detailed analysis of the results of the research conducted among students, broken down by country, was presented in Attachment 2_BAS4SC_WP2_Teachers:

- Poland – results in the spreadsheet: Analysis_T_PL;
- Croatia – results in the spreadsheet: Analysis_T_HR;



- Slovenia – results in the spreadsheet: Analysis_T_SI;
- Serbia – results in the spreadsheet: Analysis_T_SR.

Attachments

- Attachment 1_BAS4SC_WP2_Students
- Attachment 2_BAS4SC_WP2_Teacher



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