CONTENT

INTRODUCTION 9
1 ENGINEERING – TRADITIONAL BRANCH OF THE CZECH INDUSTRY 11
2 ENGINEERING IN INDUSTRY 4.0 AND EDUCATION 14
2.1 Education for Industry 4.0 16
2.2 Educational concepts of robotics and automation in Industry 4.0 17
3 SECONDARY ENGINEERING EDUCATION AS A SUBJECT OF EVALUATION, MONITORING AND RESEARCH AND STRATEGIC OBJECTIVES OF ITS CHANGE 18
4 FRAMEWORK EDUCATIONAL PROGRAM FOR THE FIELD OF EDUCATION 23-41-M / 01 MECHANICAL ENGINEERING AS A SUBJECT OF ANALYSIS 44
4.1 Two-level curriculum in the education system 44
4.2 Framework educational program for the field of education 23-41-M/01 Mechanical engineering 45
4.3 School educational program 49
4.4 Curriculum revision context 50
4.5 Analysis of education areas from a questionnaire designed for schools 55
4.6 Analysis of the number of lessons in educational areas 57
4.7 Comparison of the assessment of the difficulty and popularity of the main school-leaving subjects from the point of view of students of secondary school with a focus on mechanical engineering 59
4.8 Evaluation of the difficulty of subjects from the perspective of students of secondary schools with a focus on engineering . . 61
4.9 Feedback of head teachers/SEP coordinators on the content and scope of curricular documents 62
4.10 Conclusion 65
5 MOTIVATION TO STUDY A SECONDARY TECHNICAL SCHOOL AND WORK IN ENGINEERING FIELD 66
5.1 Motivation as a theoretical problem 66
5.2 Performance motivation and research on factors motivating for studying 67
5.3 Methodology and results of pilot research on performance motivation 68
5.3.1 Research questions and selected descriptive results of pilot research 68
5.3.2 Relational results of the statistical analysis of the pilot phase of the research 71

5.4 Questionnaire survey methodology 73
5.4.1 Descriptive research results. 73
5.4.2 Relational research results 92
5.5 Research on the school performance motivation of students at secondary technical schools. 93
5.5.1 Descriptive research results. 94
5.6 Discussion and conclusion 97
6 EDUCATIONAL STRATEGIES IN THE STUDY OF ENGINEERING FIELDS 100
6.1 View of traditional and non-traditional educational strategies . . 100
6.2 Educational strategy not only in the future 102
6.3 Innovation in the curriculum 104
6.4 Changes in the learning process 105
6.5 Research methodology. 107
6.5.1 Research aim. 108
6.5.2 Descriptive research data 109
6.5.3 Relational research results 114
6.6 Discussion and conclusion 116
7 DIGITAL TECHNOLOGIES, DIGITAL AND READING LITERACY IN LEARNING AND FUTURE PRACTICE 118
7.1 Theoretical concepts of digitalisation in education and digital literacy. 118
7.1.1 Digital learning environment 122
7.2 Theoretical concept of reading literacy. 124
7.3 Research investigation 125
7.4 Methodology and results for the area of digitalisation and digital competencies of students 126
7.4.1 Research results 127
7.4.2 Summary on the digitalisation of teaching and learning and students' digital competencies 133
7.5 Methodology and results of students' reading literacy 134
7.5.1 Research results 134
7.5.2 Results of hypotheses verification 137
7.5.3 Summary for the area of student reading literacy and reading strategies 141
8 CONDITIONS AT SECONDARY SCHOOLS FOR THE IMPLEMENTATION OF EDUCATION IN MECHANICAL ENGINEERING DISCIPLINES 142
8.1 Conditions for mechanical engineering education according to the analysis of the Czech School Inspectorate. 142

8.1.1 Spatial, material and safety conditions in secondary education 142
8.1.2 Financial conditions in secondary education 143
8.1.3 Personnel conditions in secondary education. 143
8.2 Analysis of conditions for education by own questionnaire survey. 146
8.3 Conclusion 147
9 COMPETENCIES OF GRADUATES OF SECONDARY SCHOOLS WITH MECHANICAL ENGINEERING SPECIALISATION AS SEEN BY EMPLOYERS 148
9.1 The importance of competencies from the perspective of employers 148
9.2 Mechanical engineering graduates on the labour market. . . . 149
9.2.1 The issue of unemployment of mechanical engineering graduates. 149
9.2.2 Readiness of mechanical engineering graduates to enter the labour market. 152
9.3 Definition of competency 155
9.4 Research and methodology. 159
9.4.1 Results of analyses of employers' views on the level of competencies of graduates with an apprenticeship certificate 161
9.4.2 Results of analyses of employers' views on the level of competencies of graduates with a secondary school diploma 165
9.4.3 Overall level of competencies of mechanical engineering graduates. 168
9.4.4 A look at the differences between the desired and available skills of the two cohorts of graduates. . . . 169
9.5 Conclusion 172
10 COMPETENCIES FROM THE PERSPECTIVE OF EDUCATION PROVIDERS AND GRADUATES' EMPLOYERS 174
10.1 Analysis of key competencies from the perspective of education providers. 175
10.2 Analysis of general competencies from the perspective of education providers. 177
10.3 Analysis of professional competencies from the perspective of education providers 179
10.4 Comparison of the evaluation of graduate's professional competencies from the perspective of employers and educators. 181
10.4.1 Differences in the evaluation of the importance of graduate's professional competencies from the perspective of employers and educators . . . 182

10.4.2 Consensus in the evaluation of the importance of graduate's professional competencies from the perspective of employers and educators . . . 183
10.5 Comparison of the evaluation of graduate's general competencies from the perspective of employers and educators 185
10.5.1 Differences in the evaluation of the importance of graduate's general competencies from the perspective of employers and educators 186
10.5.2 Consensus in the evaluation of the importance of graduate's general competencies from the perspective of employers and educators . . . 187
10.6 Conclusion 188
11 CAREER COUNSELLING USING INNOVATIVE DIAGNOSTIC TOOLS 189
11.1 Selected methods used in career counselling 193
11.2 Possibilities of using Eye Tracking in career counselling . . . 195
11.3 Results of the initial check of the diagnostic tool 202
12 OPTIMISATION OF EDUCATION IN ENGINEERING DISCIPLINES FOR THE JOB MARKET 205
12.1 Outset for optimisation 206
12.2 Proposals for procedures and steps towards optimisation of secondary education in engineering disciplines 209
12.2.1 For the curricular area 209
12.2.2 For the procedural area 209
12.2.3 For the personnel area 210
12.2.4 For the area of material equipment 211
12.2.5 For the financial area 211
12.2.6 For the area of employment chances for graduates. . . 211
12.3 Supposed impact of chosen components of "the environment of the SVE system (Secondary Technical education)" on the optimisation activities 212
CONCLUSION 215
RESUMÉ 217
SUMMARY 219
RESÜMEE 221
REFERENCES 225
NAME INDEX 235
MATERIAL INDEX 237