

Introduction	8
1 THE WAYS OF ICT APPLICATION IN THE FIELD OF EDUCATION.....	15
1.1 Introduction	15
1.2 Computers in the process of education.....	16
1.3 Defining the term of e-learning	17
1.4 History of ICT in education.....	20
1.5 Conclusion.....	23
2 THE TEACHING AND LEARNING PROCESS IN E-LEARNING.....	24
2.1 Introduction	24
2.2 Pedagogical dimension of e-learning.....	24
2.2.1 E-learning as a learning process	25
2.2.2 Evaluation of e-learning – input information	25
2.2.3 Generations of e-learning courses	27
2.3 Conclusion.....	31
3 E-LEARNING AND MULTIMEDIA - A SUBJECT OF RESEARCH ACTIVITIES.....	33
3.1 Introduction	33
3.2 E-learning and pedagogical research.....	36
3.3 Problematic areas of branch didactics in natural science and technical subjects as a basis for research orientation in e-learning.....	39
3.4 Research and its objectives in the field of e-learning applications	47
3.5 Conclusion.....	51
4 THE ROLE OF E-LEARNING IN UNIVERSITY EDUCATION IN THE CZECH REPUBLIC	53
4.1 Introduction	53

4.2	E-learning at universities	54
4.3	The use of e-learning at universities	57
4.4	The process of e-learning quality evaluation	61
5	THE IMPORTANCE OF ICT FOR THE DEVELOPMENT OF CONSTRUCTIVIST METHODS OF INSTRUCTION AT UNIVERSITIES	64
5.1	Introduction	64
5.2	ICT and educational theories	65
5.3	ICT and constructivist learning theories	65
5.4	ICT in university education	68
5.5	Conclusion	69
6	INTEGRATION OF HEURISTICS ELEMENTS INTO ELECTRONIC LEARNING MATERIALS	71
6.1	Introduction	71
6.2	Heuristics and interactive graphs	71
6.3	Analysis of heuristic approach of learning	74
6.4	Conclusions	77
7	BLENDED LEARNING PITFALLS AND POTENTIAL	79
7.1	Introduction	79
7.2	What blended learning means	79
7.3	Blended learning in theories of instruction	82
7.4	Blended learning in comparison to other modes	83
7.5	Conclusions	85
8	THE PROCESS OF E-LEARNING IMPLEMENTATION: EDUCATIONAL ASPECTS	88
8.1	Introduction	88
8.2	The educational process	88
8.3	How to define effectiveness	89

8.4	How to evaluate effectiveness	91
8.5	Activities towards monitoring effectiveness.....	94
8.6	Conclusions	98
9	THE PROCESS OF E-LEARNING IMPLEMENTATION: ECONOMIC ASPECTS.....	99
9.1	Introduction	99
9.2	The e-learning implementation: related expenses.....	100
9.2.1	The educational institution	100
9.2.2	Educants	101
9.2.3	E-learning versus traditional instruction: comparison of expenses .	101
9.3	Savings on e-learning	103
9.4	Methods of measuring efficiency of the e-learning implementation process.....	104
9.4.1	The break-even point.....	105
9.4.2	Kirkpatrick/Phillips Model measuring efficiency of the e-learning implementation process	106
9.5	Financial sources supporting the process of e-learning implementation into education	110
9.6	Conclusions	110
10	ICT IN THE PROCESS OF INSTRUCTION, A TOOL FOR DEVELOPING MANAGERIAL SKILLS.....	111
10.1	Introduction	111
10.2	Where are the roots of managerial skills training?	111
10.3	University environment and language techniques	112
10.4	E-learning as a managerial phenomenon	115
11	ON THE PROCESS OF FORMING KEY COMPETENCES IN THE EUROPEAN UNION	116
11.1	Introduction	116
11.2	The role of European documents and organizations in the process .	117

11.3	Key competences and lifelong learning.....	124
11.4	The Czech and Slovak Republic’s contribution	124
11.5	Conclusion.....	125
12	MODERN INFORMATION AND COMMUNICATION TECHNOLOGIES IN RELATION TO INFORMATION COMPETENCES OF UNIVERSITY STUDENTS	126
12.1	Introduction	126
12.2	Modern information and communication technologies	126
12.3	The literacy from a university student point of view	130
12.4	Competences for 21th century	133
12.5	Conclusions	134
13	KEY COMPETENCES: COMMUNICATION IN MOTHER TONGUE AND FOREIGN LANGUAGES AS PART OF LIFELONG LEARNING	135
13.1	Introduction	135
13.2	European Reference Framework	136
13.3	Communication in mother tongue and foreign language.....	136
13.4	Communication Skills	138
13.5	Political Tools Profile of Language Education.....	143
13.6	Conclusion.....	144
14	DEVELOPMENT OF THE DIGITAL KEY COMPETENCE IN SCIENCE TEACHER TRAINING.....	145
14.1	Introduction	145
14.2	Digital key competence	146
14.2.1	Definition of the digital key competence.....	146
14.2.2	Skills in digital key competence	146
14.2.3	Use of Information Society Technology in digital key competence	147
14.3	Digital key competence in science teacher training.....	147
14.3.1	Model of teacher development in using ICT	147

14.3.2	Science teacher competences.....	148
14.4	ICT training in science teacher training programme	150
14.5	Conclusions	152
15	INFORMATION LITERACY AS PART OF TEACHER COMPETENCES	153
15.1	Defining the content of 'information literacy'	153
15.2	Information literacy of teachers in the context of ICT implementation to schools	155
15.3	Information literacy of teachers – its components	157
15.4	Information literacy of teachers - a component of professional competences	159
16	KEY COMPETENCES OF UNIVERSITY STUDENTS	161
16.1	Introduction	161
16.2	Key competences	161
16.3	Information competences	164
16.4	Educational standards and models of information competence	165
16.5	Seven pillars of information literacy	166
16.6	Information competence educational models	167
16.7	Experience in running an e-learning course on information competence development	168
16.8	Conclusions	169
	List of figures.....	170
	List of tables	171
	Index	172
	Bibliography	176