

New European Thematic Network “Future Education and Training in Computing: How to support learning at anytime anywhere” (FETCH) ¹

The ETN FETCH is the new ERASMUS Lifelong Learning Programme (Erasmus Academic Networks) coordinated by University of Ruse (Bulgaria) for the period October 2013 – September 2016. Only 7 projects have been accepted for founding from European Commission after a strong evaluation procedure. The consortium includes 67 partners from 35 countries – the list of participants is presented in table 1.

Table 1. List of participant in ETN FETCH

Partner No	Country	Legal name
P1	Bulgaria	“Angel Kanchev” University of Ruse (Project Coordinator)
P2	Austria	Vienna University of Technology
P3	Belgium	BIKEMA-Gent
P4	Belgium	VARTEC NV-Gent
P5	Bulgaria	Sofia University “St. Kliment Ohridski”
P6	Bulgaria	Technical University of Sofia
P7	Bulgaria	Technical University of Varna
P8	Bulgaria	Technical University of Gabrovo
P9	Bulgaria	University of Veliko Turnovo
P10	Bulgaria	University of Plovdiv
P11	Bulgaria	Univ. of Library Science and Information Technologies
P12	Bulgaria	International Business School
P13	Bulgaria	Institute of Information & Communication Technologies
P14	Bulgaria	Institute of Mathematics and Informatics
P15	Bulgaria	IEEE Bulgaria Section
P16	Bulgaria	BAIT
P17	Cyprus	University of Cyprus
P18	Czech Republic	Czech Technical University
P19	Denmark	Aalborg University
P20	Estonia	Tallinn University of Technology
P21	Finland	Lappeenranta University
P22	Finland	University of Tampere
P23	France	University of Versailles
P24	Germany	HTW Berlin
P25	Germany	Ilmenau Technical University

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P26	Germany	Comhard Berlin
P27	Germany	GFaI Berlin
P28	Germany	IIEF GmbH
P29	Greece	University of Ioannina
P30	Hungary	University of Szeged
P31	Ireland	Dublin City University
P32	Italy	University of Calabria
P33	Italy	University of Pavia
P34	Italy	University of Palermo
P35	Italy	University of Napoli Parthenope
P36	Italy	Anghelos CCS
P37	Latvia	Riga Technical University
P38	Lithuania	Vilnius University
P39	Lithuania	Kaunas University of Technology
P40	Lithuania	Vilnius Gediminas TU
P41	Luxembourg	University of Luxembourg
P42	Malta	University of Malta
P43	Netherlands	Delft University of Technology
P44	Poland	Warsaw University
P45	Portugal	University of Coimbra
P46	Romania	Academy of Economic Studies
P47	Romania	University of Pitesti
P48	Slovakia	Slovak University of Technology
P49	Slovenia	University of Nova Gorica
P50	Slovenia	Temida Ltd.
P51	Spain	University of La Laguna
P52	Spain	University of Malaga
P53	Sweden	Linnaeus University
P54	United Kingdom	Liverpool John Moores University
P55	United Kingdom	Heriot-Watt University
P56	United Kingdom	Tellus Ltd
P57	Croatia	University of Rijeka
P58	Iceland	Reykjavik University
P59	Liechtenstein	University of Liechtenstein
P60	Norway	Østfold University College
P61	Serbia	University of Novi Sad
P62	FYR Macedonia	University Ss Cyril and Methodiuous, Skopje
P63	FYR Macedonia	South East European University, Tetovo
P64	Turkey	Selcuk University
P65	Turkey	University of Bahcesehir
P66	Turkey	Izmir University of Economics
P67	Albania	Polytechnic University of Tirana

The work of the consortium will be based on the rich experience and results achieved by the previous successful networks ECET, DEC and TRICE.

AIMS AND OBJECTIVES

The consortium's *main aims* are the achievement of intelligent growth, and building a knowledge and innovation based computer society through raising the quality of computing education, introducing modern innovative technologies in education, sharing knowledge, discussing methodologies, promoting exchange of good practice between all parties.

Specific *project objectives* are:

1. Develop a European Strategic Framework for Computing Education and Training 2020 (ECFCET-2020)
2. Develop a European Evaluation Framework in Computing Education and Training 2020 (EEFCET-2020)
3. Preparation of recommendations for future digital curricula in Computing Education and Training 2020.
4. Develop new didactical theories and learning models for using social media education.

ECFCET-2020 will:

1) Define learning outcomes based curricula and syllabi incorporating enhancement of creativity, innovation and employability skills for bachelors, masters and doctors in Computing, and for their implementation in European higher education institutions;

2) Establish the best teaching modalities, instructional strategies and adaptive learning using social networking tools and environments for computing.

EEFCET-2020 will consider an evaluation of curricula and syllabi of bachelors, masters, and doctors in Computing, and their implementation in European higher education institutions. *EEFCET-2020* will appraise three factors: Knowledge, Skills and Competences gained from Computing Education and Training.

A set of recommendations regarding the future of Digital Curricula for Computing Education 2020 will be developed and published. These recommendations will deal with pedagogical strategies and approaches that need to be adopted for future digital curricula, as well as technological tools and resources that should be taken into consideration.

New didactical theories and learning models for using social media in education will be developed: tested in a group of partner universities. Partners will be familiarised with experiment results at special sessions of e-learning conferences.

Two annual international conferences (Computing & e-Learning) will be organised, one with a Workshop "Advances in high performance information services for digital, multilingual education", and the other with special sessions to discuss the developed models.

PROJECT OUTCOMES

The main project outcomes and products are:

1. European Strategic Framework for Computing Education and Training 2020
2. European Evaluation Framework in Computing Education and Training 2020
3. A set of recommendations for future digital curricula in Computing Education and Training 2020
4. New didactical theories and learning models for use social media in educational
5. Six conferences and six workshops as co-events to the conferences in the field of computing.

TARGET GROUPES

The main *Target Groups* (TG) that will be accessed during the project are:

1. University and national policy-makers in the field of computing education (this group comprises people and institutions instrumental in applying project results in education).
2. University academic staff who are lecturers/trainers in Computing (this group will take the most active part in developing ESFCET 2020 & EEFCECET 2020, in detailing recommendations for future digital curricula in Computing Education and Training, in the expounding models for using social networks as a medium for education, in introducing new forms of education, and so on).
3. Bachelor, Master & Doctoral Students (They will benefit from models for social media supported education, as well as from processes for transition from standard curricula to digital curricula in Computing Education and Training).
4. Research institutes and centres in Computing (this grope will play a vital role in developing the two frameworks, in detailing recommendations for future digital curricula, in developing models for education supported by social media).
5. Companies and SMEs in the field of Computing (it will have a significant contribution to building EEFCECET 2020, and will mainly specify the competences which graduates should possess to become more competitive and employable at the European labour market).

WORK PACKAGES

<i>W1: Project Management & Coordination</i>

WP1 takes care of the precise implementation of all financial and administrative academic tasks of the project. WP1 will be responsible for day-to-day project management, will provide a forum for communication and develop successful working practices between all partners, all at a sufficiently high managerial level. WP1 is also responsible for monitoring project performance, results, and risk management.

***W2: National and European frameworks for development of
Higher Education until 2020***

WP2 will study existing National and European frameworks for development of higher education until 2020 and their implications for Computing. It will also investigate the suitability of novel approaches to planning, launching and teaching computing; compare and evaluate traditional & scalable, web-based solutions for HE. WP2 will survey existing traditional & web-based methodologies to identify best practices for student evaluation, retention, and experience. This will result in a better understanding of how to optimally design, plan and offer web-based computing education to multiple users with differing backgrounds and skills. Consequently, it will be possible to optimise education quality, ensuring consistent student evaluation and maximize retention. P55 will research and develop Europe-wide criteria for optimal students' evaluation and competence focusing on approaches to ensure equivalence and transfer of credit between computing courses within participating institutions. This is in line with the objective to ensure growth whilst building knowledge using flexible multi-user online education platform and promoting exchange of experience and good practice between partners.

***W3: European Strategic Framework for Computing Education
and Training 2020***

WP3 addresses the development of a *European Strategic Framework for Computing Education and Training 2020 (ESFCET 2020)*, especially fulfilling *Europe 2020* objectives: smart, sustainable and inclusive growth. The aim is to create a solid, global strategic framework that leverages both local and transnational competences to enhance Computing Education in Europe and secure long-term competitiveness by expanding opportunities for learning mobility and enhancing partnerships between education, industry, alumni and society. Based on EQF, WP3 will focus on understanding how new generations of high-level ICT-skilled people can be trained through successful and lasting education strategies, making lifelong learning and mobility a reality, enhancing creativity & innovation, and increasing employability skills. Work of WP3 is correlated to that of WP2, WP4 and WP5. WP2 provides information about existing methodologies in computing education within participating institutions, along with best practices for student evaluation, retention, and experience. Similarly, WP5 supplies information about open educational resources, integration of online tools in learning and intellectual property rights. The outputs of WP3 will be assessed by WP4 in terms of attributes such as organizational structure, goals, metrics, technology and learning/teaching approaches.

**W4: European Evaluation Framework in Computing Education
and Training 2020**

WP4 will take care of the development of a European Evaluation Framework in Computing Education and Training 2020 (EEFCET 2020). The framework will be in line with the EQF, and will be evaluating three factors: Knowledge, Skills and Competences gained from Computing Education and Training. The development of the Framework will take into consideration the three stakeholders: 1) *Professors*, 2) *alumni* (former students that are now employed, that will evaluate how much their computing education and training was in line with the work skills set requirements of industry and in general in IT field), 3) *Industry Experts*, who employ the new generation of graduated students and evaluate their knowledge, competences and skills gained from their computing education and training. Literature review, surveys, and interviews with the three parties involved will be organised, and will be cover approaches, methods, and processes for evaluation of curricula and syllabi, and their implementation in European higher education institutions and enterprises. Ethical Issues for Learners and Teachers will also be a part of this WP. EEFCET-2020 will address, amongst others, the evaluation of the following: quality of curricula and syllabi, in line with the three factors of Knowledge, Skills and Competences. The goal is to define and utilise such processes for forming a framework when EEFCET-2020 is applied and implemented.

**W5: Digital curricula in Computing Education
and Training**

WP5 This work package will address the changing nature of “curriculum” as textbooks and other learning resources go digital. The primary activity will be collecting apposite information of best practice in digital curricula within European Higher Education Institutions (HEI). Furthermore, a series of virtual workshop discussions will be held, on identifying current technological trends and their possible integration in teaching practices within Higher Education Computing courses. Moreover the WP5 will deal with the concepts of Open Educational Resources, e-textbooks and integration of online tools in the learning processes. In particular the aspects related to intellectual property rights of new digital curricula will be addressed. Also ethical questions and problems that result of distance and digital learning will be targeted. Learning is demanding less and less physical presence. Where does this take us? Based on these activities the overall work package outcome will be a set of recommendations for Digital Curricula in Computing Education and Training 2020.

W6: e-Learning and m-Learning in Computing supported by social media

Social media plays an important role in the daily life of students with some preferring to be online 24/7. The challenge of this WP is to integrate students' daily use of social media in learning. Educational experiences and activities should be important discussion topics in the network. Currently companies provide distance learning courses supported by social media. One goal of this WP is to give traditional Universities an important place in these new developments as centres of learning and education.

FETCH partners have a long experience in e-learning. Special digital tools have been developed to distribute learning material, and stimulate and support communication between lecturers and students. WP6 will research the use of social media in learning, showing its advantages. Obviously the resulting ethical issues will be highlighted. New didactical theories and learning models will be developed for using social media in education. These new theories will be validated by teaching experiments. Organising three annual e-Learning conferences with special sessions on these topics.

W7: Quality Assurance

WP7 takes care of the assurance and evaluation of the quality performance of all project activities. It is an integral part of the Project to ensure that objectives are met in the most effective and efficient ways. WP7 will include analysis and evaluation of project activities, interim and final project outputs, products, results. Maximum effectiveness in realizing the project ideas can be achieved if all results and activities are evaluated in due time. For this purpose an Evaluation Board (EB) will be set up. The EB will monitor the implementation of all project tasks at each stage; it will develop quality assurance (QA) plan and will manage all activities related to project quality assurance and evaluation.

W8: Exploitation of Project Results

WP8 exploits FETCH project results and concerns all activities designed to ensure that the results are appropriately recognized, demonstrated and implemented on a wide scale. It aims at promoting project outputs to relevant target groups and facilitating implementation of project results by highlighting them to relevant decision-makers.

The developed European Competence Framework in Computing Education and Training 2020, European Evaluation Framework in Computing Education and Training, the digital curricula in computing, new didactical models and so on, will create preconditions to significantly raise Computing education quality and ensure graduates possess industry relevant competences. It will be a cornerstone for lifelong learning in computing: providing learning anytime and anywhere. The

results of the implementation of the WPs will enable partners to make lifelong learning a reality for all: making learning more attractive. ETN FETCH will systematise the National concepts for the development of the HE in each partner country, and European Commission directives, and will conclude how they affect the Computing education. It also offers the computing industry a new relationship with education and research. It will open new opportunities for the commercialisation of research and closer bilateral exchange. Together with the leader of WP8, MG will play a strategic role in directly advising and validating project results and help measure their impact on industry education activities and policies. It can be thought as a “one layer up” the typical projects clustering collaboration, including direct dissemination to the industry educational associations. The project results will be a good tester for e-learning and m-learning in computing education supported by social media and a pressure for national policy makers to adopt new education directives.

<i>W9: Dissemination of Project Results</i>
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WP9 takes care of disseminating information and materials relating to the FETCH project results through continuous updating of the on-line information, specifying the outputs and products of the project; organising and conducting international round table discussions and conferences; publishing the achieved results periodically in newspapers, magazines, brochures and scientific conferences and journals, making presentations on the TN activities at the universities, preparing newsletters, booklets, etc. A project dissemination and exploitation plan will be elaborated at the very beginning, which will comprise measurable, realistic objectives, that adheres to a timetable and provides a complete budget of the FETCH project. The co-ordinator will also take advantage of the EVE platform for the dissemination and exploitation of results of the project.

Information is summarized by

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