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## DYNAMIC – Towards responsive engineering curricula through europeanisation of dual higher education

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### Newsletter 3 - October 2019

Dear DYNAMIC readers,

Dual education is becoming increasingly important across Europe. As its role has grown, so has the attention and priority that several EU countries place on the training of the enterprise mentors who are responsible for the practice-related learning of students of these programmes

In the early autumn days of October, we are happy to share with you our latest e-newsletter containing information about some of the DYNAMIC project activities undertaken in the past months.

Much has happened, and there is still a lot we have to do in the coming months...

**We wish you pleasant and interesting moments in reading it!**

**Greetings,  
the DYNAMIC project team**



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## **UPCOMING EVENT: 9th Balkan Region Conference on Engineering and Business Education (BRCEBE)**

### ***Unique opportunity to share, learn and network***

From 16 till 19 October 2019 Sibiu, Romania will be host of the 9th Balkan Region Conference on Engineering and Business Education (BRCEBE) & 12th International Conference on Engineering and Business Education (ICEBE).

The BRECEBE Conference is organised by the Lucian Blaga University of Sibiu and the Hochschule Wismar every 2 years with broad participation of engineering, technology and business education stakeholders from around the globe. The conference is part from the planned DYNAMIC dissemination activities. The DYNAMIC project will have keynote speakers, a panel session of papers with a main focus on the dual higher education in Science & Technology Studies, and a dedicated workshop on dual higher education to learn from specifics and experience of DYNAMIC. The project team will also hold a meeting during the period.

The conference's mission is to disseminate recent research findings and development outcomes in engineering and business education as well as capacity building, with a focus on interdisciplinary and cross-cultural collaboration. This conference offers a unique opportunity for academics, practitioners and students from around the globe to share their knowledge, concerns and perspectives on educational environment and mind-set, suitable for the development of innovative tech-products, tech-apps, business-processes, business-models and personal development with a global and local impact.

The main topics of the 9th BRCEBE & 12th ICEBE 2019 are:

- Entrepreneurship education and research; Cooperation between academia and business
- New curricula development, Multimedia, and innovative new methods for engineering and business education
- Knowledge management, quality management, sustainability in engineering and business education
- Lifelong learning
- Dual study programmes
- Social and philosophical aspects of engineering and business education
- Management of engineering and business institutions
- HCI (Human Computer Interaction) applications for educational purposes
- National culture innovation and education development, and the heritage and the development of national culture under economic globalization

For more information about the conference programme, participation and conferences fees, please visit: <http://conferences.ulbsibiu.ro/brcebe/> We hope to see you there.

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## 4th Transnational DYNAMIC Project meeting was held in Varna, Bulgaria

***The participants have seen the organization of practical training of students in a real working environment at Keppel FELS Baltech Ltd.***

The 4th DYNAMIC Transnational Meeting was held in Varna over 3 days (from 1<sup>st</sup> to 3<sup>rd</sup> of September 2019) with the main purpose to bring together consortium partners as well as stakeholders to discuss about the actual status of dual study education with respect to project implementation as well as relevant research, theory, technologies and models.

The event offered the opportunity for university professors, researchers, students and industrial companies to share their experience, best practices, and ideas related to current and emerging issues associated with practice-integrated dual study education programs which strengthens the supply-demand feedback chain between University-Business-Cooperation.

It also enabled the partners to report and plan on the current and future state of the project. It involved updating the partners on progress achieved in the implementation of the dual education programmes in BG and RO (Mechatronics and Robotics; Marine engineering and Shipbuilding & Construction respectively) as well as the changes affecting implementation in HR where the project welcomed a new University partner needing to be speedily informed about the details, toolkits, and procedures of the project. It also served as the venue for the Transnational Multiplier Training (led by partners AHK BG and AHK RO). Other topics covered by the project team included management issues, study visits (including the visit of Romanian partner company Keppel FELS Baltech Ltd), external evaluation, dissemination activities, and exchanges about the final project conference to be held in Sofia in Autumn 2020 (more on this conference can be expected early next year).

The Study Visit at Keppel FELS Baltech Ltd on 4<sup>th</sup> of September enabled the

partners to see the work environment and talk to students and mentors of this company. A tour of the different work stations and how tasks for new, older (and even ex-students having become staff members) can vary based on study progression. Overall the visit provided insights of how enterprise partners could organise and structure such work placements and staff oversight and mentoring.

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## DYNAMIC Train the trainer course in Varna, Bulgaria

### ***Company mentors were educated how to provide dual higher education***

Lasting a week, from 30.05 to 5.06, DYNAMIC partner AHK Bulgaria organised and ran a Train-the-trainer course with company representatives from ABB Bulgaria, Keppel FELS Baltech, MTG Dolphin Shipyard, Herti Ltd as well as TU Varna.

The training is part of the 4th Work package of the DYNAMIC project „*Train the trainer course for industrial supervisors in dual higher education programmes*“. With a total duration comprising of 40 lesson units and based on the training scheme and materials also used in Germany by the Ordinance on Trainer Aptitude and the 79 Chambers of Commerce and Industry within Germany, the training content was developed with a coverage of the following key topics: the role of the company mentor/trainer; planning of the company training; improvement of the pedagogical and necessary soft skills; structuring training and teaching methods; legal aspects of the dual higher education and organisation of the training in real work environment.

The dozen participants, who themselves are now qualified to train other company mentors, acquired theoretical knowledge and practical skills and gave positive feedback form the organised training and the educational, pedagogical, psychological and legal knowledge they received during the training. These persons can now act as multipliers, in-house or industry-wide to promote the quality mentoring of students in the practice-related parts of their dual studies.

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## New partner: DYNAMIC welcomes its new project partner

***The Croatian University of Juraj Dobrila in Pula has become a partner and presents itself and how it educates engineers at the level of today's technical knowledge in the areas of production and computer engineering***

The founding of the University of Juraj Dobrila in Pula dates from the beginning of 21st Century, but the transformation of the higher education institution into an independent university and its organisation as a departmental university took some years longer. The University of Juraj Dobrila in Pula was established by the Law on the Establishment of the University of Juraj Dobrila in Pula on September 29, 2006. Today the University of Pula is organised into scientific and other departments and organisational units. Its departments are structured along scientific classification criteria by fields (social, humanistic, artistic and biotechnical) and fields (economics, educational sciences) so that the activity is connected in teaching and research activities. The University of Pula currently consist of:

- Faculty of Economics and Tourism
- Faculty of Education
- Faculty of Philosophy
- Pula Music Academy
- Faculty of Interdisciplinary, Italian and Cultural Studies
- Faculty of Informatics in Pula
- Faculty of Medicine in Pula
- Department of Natural and Health Studies
- Department of Technical Studies
- Center for Cultural and Historical Research on Socialism
- Center for Competence in Education
- University Library

- Student center

The Department of Technical Studies, under the University of Jurja Dobrile in Pula, has the aim to educate engineers at the level of today's technical knowledge in the areas of production and computer engineering, by combining new technologies and industrial practice.

In addition to the basic technical, conventional and mechanical disciplines, it is increasingly focused on the study of new STEM technologies, with an emphasis placed on the use of 3D printers, mechatronics and robotics.

The VISIO scientific technology institute of the University (Institute VISIO), has the aim to improve the level of education in areas of engineering. Its main objective is to raise laboratory and practical knowledge to state-of-the-art level in the areas of production and computer engineering, by combining new technologies and industrial practice. In collaboration with the Department of Technical Studies, it has a laboratory equipped with eleven Prussa i3 3D printer's, which are used daily for both educational and productive purposes.

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## 2 Train the trainer courses held in Romania

***The Trainings provided by AHK Romania were highly appreciated by the participants***

*Oana Nastasă (The German-Romanian Chamber of Commerce and Industry (AHK Romania) reports on the train-the-trainer course (TTT) run as part of the DYNAMIC project.*

### **Why TTT Training?**

In the DYNAMIC Project, the German-Romanian Chamber of Commerce and Industry (AHK Romania) has the role to develop training materials customized for the higher education sector and to integrate the results in customized TTT training offering for enterprises.

A very important element in the dual education is the qualification of mentors. This training specifies how pedagogical and professional skills can be combined with activity-based and process-oriented content.

The TTT Training – under the DYNAMIC project – gives the participants or new mentors the pedagogical competency according to the German System known as best practices approach in the field of dual education.

### **Analysis of training needs**

After researching the training needs of the enterprise's mentors involved in the field of education (from companies Marquardt and Continental from Sibiu) – AHK has delivered, at end of May and beginning of June 2019, two adapted TTT Trainings for company tutors. These trainings reached 25 participants overall.

### **Overview of TTT trainings**

The main objectives of the two TTT trainings were:

1. to develop and to encourage the professional and the pedagogical skills of the mentors in order to efficiently train the students involved in the dual education system;
2. to introduce the participants to the basic principles of learning and to fully establish the responsibility of the mentor;
3. to inform participants of the methods of training available to them, with particular attention given to didactical conversation and to the on-the-job session (4 steps method).

### Structure of the training

The TTT Training involved 4 steps:

1. Evaluate Training Requirements in relation to dual higher education sector
2. Prepare Training
3. Conduct Training
4. Complete Training / Evaluation

**Training duration:** 25 hours for each training course, covering the following topics:

- Higher dual education system in Europe;
- Principles of effective learning, the process of learning, factors that hinder learning;
- Obtaining and holding the students' attention, facilitating understanding, motivation;
- Why train? The mentor's role and responsibility;
- Methods of training – the right method for the dual education field;
- Types of training aids – how to make and use them;
- Planning and delivering a training;
- Evaluating, how to give a feedback;
- Organising and managing a training session – practical activity.

### Feedbacks from participants (via Mentimeter):



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## Pilot implementation of the Dual Study programme in Technical University of Varna, Bulgaria

*Author: Galina Ilieva, Lecturer at the Department of “Naval Architecture and Marine Engineering” at TU Varna (TUV)*

In the months of March, April and May 2019, three regional focus group meetings were organised among DYNAMIC partners from Bulgaria: TUV, MTG “Dolphin” and Keppel FELS Baltech Ltd (KFB). The meeting main tasks were as follows: to define the needs of industry and training needs of our students; to find appropriate models, timetables and organization of VET; to determine the syllabus content; to arrive to an agreement on contractual terms between the university and stakeholders; to determine how to implement the programmes (e.g. assessment methods, time-schedule, expenses, confidentiality, property rights, labour protection, etc.); to develop a toolkit to facilitate and support the communication between industry and university; to define topics for training workshops; to determine templates for students’ diaries and contracts, etc.

The pilot implementation for students from Technical University of Varna had already started in October 2018 with students from the specialty of “Marine engineering”. Six students from this specialty have now passed their practical education and training in “Repair of marine machinery” in workshops of our industrial partner MTG “Dolphin”-Varna.

Next, students from the specialty of “Naval Architecture and Marine Technology” were also invited to attend a workshop for introduction to the VET specifics and they were subsequently involved in receiving the dual training during the summer vacation.

The considered and accepted structure of VET for students from the specialty of “Naval Architecture and Marine Technology” is organised in two phases: workshops during semesters at the University; and in the partner’s company – during the

summer vacation. Students start their dual education after the 6th semester. Student applications are approved by the industrial companies. Regarding the workshops, one is organised at the Technical University and other ones at the locations of each of both the industrial partners. Goals of workshops are to promote the VET dual study opportunity among the students as well as to present and discuss issues and questions about the requirements of the business partners providing the practical training..

The practical phase of the studies, taking place during the summer vacation, is characterised by the following: update of the syllabus in agreement with the needs of the industrial partners (where changes are possible); students work on practical tasks provided by the companies; contracts are to be signed once between the Technical University and the industrial partner, and once between the company (industrial partner) and each student; students have an obligation to fill-in practical diaries during the entirety of their training periods.

In regards to the DYNAMIC project, students are able to work on design tasks either directly at the company KFB premises or in specially arranged premises organised at the University.

VET for students from the specialty of “Marine engineering” involves:

- practical training and students gaining knowledge in specific subjects, related to the processes of construction, montage, de-montage and repair of marine machinery in workshops run by the industrial partners;
- student’s working on specific tasks provided by their industrial mentors and professors;
- students and others providing feedback that can lead to an update of the syllabus – where needed and possible;
- student applications being approved again by the industrial companies followed by signed contracts by both parties;
- students completing logbooks (diaries for practical training) for their VET hours with a detailed explanation of the tasks undertaken and solved.

Logbooks for all students from both specialties are under the control of professors and industrial mentors.

In addition to the above, four Master level students from our new specialty “Design of marine power plants and systems” are also involved in the dual education. These four students within the first two semesters of their study were involved in VET in the following subjects: “Computer systems for design of ships and marine equipment” (with a first part (15 hours of lectures and 45 hours of exercises) and a second part (60 hours of exercises)); and “Design of systems and devices for ships and marine equipment” (with 30 hours of lectures and 15 hours of exercises).

The DYNAMIC Project is still ongoing, the TU Varna will continue to work on the development of new programmes and explore the possibilities to broaden uptake by

students and implement project outcomes to VET in other specialities.

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