

## Key Note Speech:

# ANALYSIS OF DUAL HIGHER STUDY PROGRAMMES IN GERMANY, AUSTRIA & SPAIN AND RECOMMENDATIONS FOR WESTERN BALKAN COUNTRIES

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# CONTEXT/INTRODUCTION (I)

## **Strengthening capacities for the implementation of dual education in BH higher education (DUALSCI)**

- As part of this 3 year Erasmus+ project (2020 – 2023) a report on the state-of-the-art in dual higher education was developed.
- The report includes results from information provided on 15 dual study programmes in higher education from programme countries in different industrial sectors (Austria, Spain, Germany).
- The report also elaborates the concept of “Dual Higher Education (DHE)” and the overall framework for dual education at the respective universities and beyond.
- The report concludes with a short summary and conclusions regarding options for DHE programmes in Bosnia and Herzegovina.



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# CONTEXT/INTRODUCTION (II)

➔ The main results from the analysis and findings of the report were condensed into the article

**ANALYSIS OF DUAL HIGHER STUDY PROGRAMMES IN GERMANY, AUSTRIA & SPAIN AND RECOMMENDATIONS FOR WESTERN BALKAN COUNTRIES**  
presented at this Conference

The full DUALSCI project report can be found under:  
<https://dualsci.unze.ba/project-results/>



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# STRENGTHENING CAPACITIES FOR THE IMPLEMENTATION OF DUAL EDUCATION IN BH HIGHER EDUCATION (DUALSCI)

## 3 year ERASMUS+ project with the main aim:

- to improve the **competences** of higher education graduates and their
- **employability** in cantons and entities of Bosnia and Herzegovina.

## Specific project objectives:

- The **implementation of dual education into HE systems** in cantons and entities of Bosnia and Herzegovina;
- Enabling students to learn **more relevant knowledge and skills** through dual education;
- The **improvement of the legal framework and accreditation standards** in cantons and entities of Bosnia and Herzegovina in order to adapt to dual education.
- Development of **generic model of dual education** (DUALSCI model) **to support different needs and interests of students, companies, higher education institutions** (HEIs) in different cantons/entities of BIH and
- to provide **recommendations** to HEIs for implementation of dual education in the entire BIH.



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# THE DUALSCI PROJECT - PARTNERS

**Coordinator:** University of Novi Sad

**EU Partners:**

FH Joanneum; Duale Hochschule Baden-Württemberg, IMH Dual Engineering  
University School, WUS Austria

**BiH Partners:**

University of East Sarajevo, University of Sarajevo, University of Mostar,  
University of Zenica,

Ministry for Scientific and TD, HE and IS

Ministry for Education, Science and Youth of Sarajevo Canton

Ministry of Education, Science, Culture and Sport of the West-Hercegovina  
Canton

Ministry for Education, Science, Culture and Sport of Zenica-Doboj Canton

Chamber of Commerce of Republic of Srpska

Chamber of Commerce of Federation of B&H

BIT Alliance



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# MAIN OUTLINE OF THE ARTICLE

- 1. Introduction and main definitions**
- 2. Analysis of study programmes in 3 EU countries**
- 3. Comparison of data**
- 4. Conclusions and recommendations**
- 5. Main references**



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# 1. INTRODUCTION AND MAIN DEFINITIONS (I)

## DUAL HIGHER EDUCATION...

- = an approach that **formally integrates students' academic studies with work experience** in enterprises/industry.
- relies upon a **three-way partnership**: the student, the Higher Education Institution and the employer.
- The **exact format of collaboration** is usually established in **specific agreements between the company and the HEI**, outlining
  - the number of students received by the company (e.g. 10 to 20),
  - whether students work for free or receive a salary,
  - the number of hours per semester (e.g. 150-300) and
  - other rights and responsibilities of students and the company.
- Companies are also expected to find **mentors** for students who will be able **to guide them during their practical work at the company** and who **assess their work** at the end of the semester. There is no obligation to employ students after their education.



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# 1. INTRODUCTION AND MAIN DEFINITIONS (II)

**DHE – A three-way partnership** between the student, the Higher Education Institution (HEI) and the company:

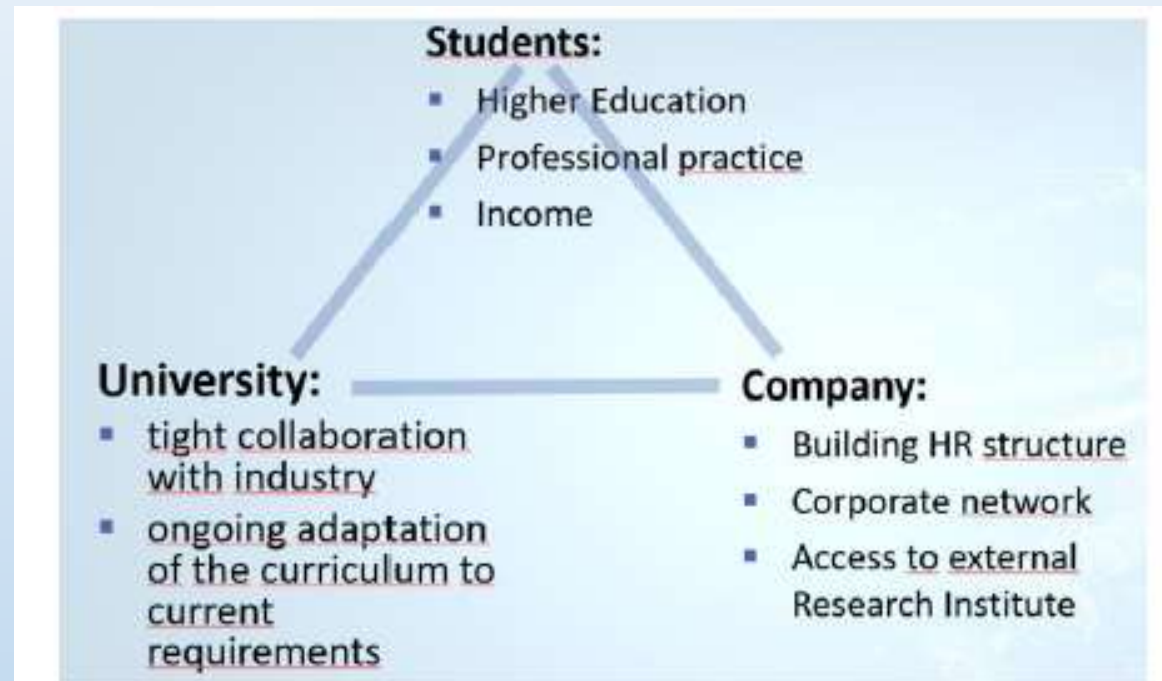


Figure. Key actors in Dual Higher Education

Source: Hagen Hochrinner, FH JOANNEUM, 20. 6. 2020.



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# 1. INTRODUCTION AND MAIN DEFINITIONS (IV)

⇒ **DHE** can be used to achieve a number of **different objectives**, such as:

- to develop **vocational skills that contribute to recognised vocational qualifications**;
- to develop **general work habits and job-readiness**;
- to help students to **understand what is involved in jobs** so that they make **better career choices**;
- to give job seekers access to **opportunities to work that they might not have otherwise**.

It is related to the **system of apprenticeship** in Germany, Austria and Switzerland and requires **two learning venues** (university and company) with a **coordinated curriculum for both learning places**.

⇒ **Cooperative education**:

Commonly used in North America to refer to **programmes in which learners spend time in several workplaces** (companies) and **receive academic credit for the work experience**, but in which there **may be little connection between what the student does in the workplace and the curriculum of the school or college**.



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# 1. INTRODUCTION AND MAIN DEFINITIONS (III)

The following **types of learning concepts or models** are often used in **vocational/technical education related to work-based learning**:

- **Curriculum-integrated learning**: Model of learning that describes the development of integrated lessons helping students **make connections across subjects and disciplines**.
- **Work-related learning**: Planned activity that uses the context of **work to develop knowledge, skills and behaviours useful in the workplace**, including **learning through the experience of work**, learning **about work** and **working practices**, and learning the skills for work.
- **Work-based learning**: An educational strategy that **provides students with real-lifework experiences** where they **can apply academic and technical skills** and develop their employability skills.
- **Work-integrated learning**: Forms of **experiential learning** where the site of learning either occurs **in the workplace** or where the learning is strongly **associated with a workplace**.

⇒ These models have **different advantages and disadvantages**: for learners, for employers, for schools and colleges, and for governments.

⇒ Main **distinction** – by the **extent** to which **connections** are being made **between subjects, extent** to which **work related elements** are foreseen and **extent** to which **curriculum and work-related elements are interlinked** and interwoven.



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## 2. ANALYSIS OF EU STUDY PROGRAMMES (I)

In order to better understand the conceptual model of dual studies, **15 study programs from EU program countries (Austria, Germany and Spain)** were analysed.

For this purpose, a **detailed questionnaire** was developed under the DUALSCI project which can be accessed in the full **DUALSCI report** under <https://dualsci.unze.ba/project-results/>

Among others, the questionnaire included questions related to:

- **Length** and **overall structure** of the programme
- **Teaching staff** from HEIs in %; Teaching staff from industry in %
- Specific **requirements for teaching staff**
- **Balance** between education in **institution & company** (in % and number of days/months)
- **Formal contracts** with company (yes/no).
- **Payment** of students by industry partners (yes/no, partly..)
- **Assessment:** Student assessment by HEIs (in %), Student assessment by industry partners (in %)
- **Modalities of assessment** during apprenticeship periods
- **Final thesis:** ratio of mentors from HEIs and industry



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## 2. ANALYSIS OF EU STUDY PROGRAMMES (II)

### AUSTRIA

Name of study programme	Implementing University
PTO – Production Technology and Organization	FH JOANNEUM, Graz
ENP – Engineering and Production Management	FH JOANNEUM, Graz
Mobile Software Development	FH JOANNEUM, Graz
HSD – Hardware-Software Design	FH OBERÖSTERREICH
Electrical Engineering Dual	FH VORARLBERG



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## 2. ANALYSIS OF EU STUDY PROGRAMMES (III)

### GERMANY

Name of study programme	Implementing University
Business Administration	Baden Wuerttemberg Cooperative State University Heilbronn (DHBW Heilbronn)
Management & Business Psychology	FOM Hochschule für Oekonomie und Management
Cooperative Study Model – Degree Programme Engineering	Heilbronn University of Applied Science
Advanced Midwifery Science	Baden Wuerttemberg Cooperative State University, Stuttgart
Mechatronics	Technische Hochschule Ingolstadt



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## 2. ANALYSIS OF EU STUDY PROGRAMMES (IV)

### SPAIN

Name of study programme	Implementing University
Degree in Automotive Engineering	University of the Basque Country
Master in Digital Manufacturing	Dual Engineering University School
Degree Primary Education	University of Lleida
Master Degree in Informatics Engineering	University of Lleida
Degree in Process and Product Innovation Engineering	Dual Engineering University School



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### 3. COMPARISON OF DATA – AUSTRIA (I)

- **Universities of Applied Science** as main “owners” of DHE programs.
- “**Classical**” **HEIs** also assume a **partner** role in developing/implementing DHE programs.
- DHE programmes **standardised** in terms of their format and layout.
- Majority of DHE programmes in **technical disciplines** and following regular **Bologna requirements** (6 semesters for Bachelor programs (180 ECTS) and 4 semesters for Master Programmes (120 ECTS)).
- Right of DHE graduates to **continue education** on Master or PhD level.
- EQF Level unified with **EQF 6 for Bachelor** and **EQF 7 for Master** Programmes.
- **Double or Joint Degrees** possible for DHE programs.
- **Accreditation** regulated by law and is carried out by the National Accreditation Agency.
- **Curricula** of DHE programmes usually offered as “**Curriculum Integrated models**”
- DHE Programmes at **Bachelor and Master** level offered by UASs

All programmes are **developed jointly by representatives of HEIs and industry partners** (IPs)



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### 3. COMPARISON OF DATA – AUSTRIA (II)

- **HEIs: lead the development and implementation** of programmes - reflected also in the ratio between **teachers from HEIs (60%) and IPs (40%)**.
- **IPs:** involved in **curriculum development, revision, mentoring the final thesis** (co-mentoring together with HEI mentor)
- **HEIs: overall responsibility for student assessments.** Involvement of IP related to practical part and not unified.
- **IPs: direct working contract with all DHE students** in line with the Austrian Labour Law - usually part time contracts (50% of the fulltime working contract).
- **First two semesters:** usually carried out only by **HEIs**.
- **Starting from the 3rd semester:** educational process divided between **HEIs and IPs** (app. 50:50 at Bachelor level, app. 60:40% at Master level).
- **Teaching Staff:** has to have **at least 3 years of relevant Industry experience** and an academic degree amounting to a minimum of **300 ECTS**.
- **Employment rate** after graduation: **90 and 100%; drop-out rates** between **15 and 30%**.



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### 3. COMPARISON OF DATA – AUSTRIA (III)

**The Austrian Ministry of Education, Science and Research** has set up the following criteria for characterizing the dual degree programmes in Austria:

- **Repeated sequence of theoretical phases and internships** with continuous reflection.
- Internships **beyond the normal scope of an internship in a technical college degree program**, both in terms of **time and in terms of the specification** of the content.
- **Acquisition of curricular defined competencies** takes place at **two places of learning** and is characterized by the **combination of science and focus on implementation**.
- **Admission process** for college and company are in the **responsibility of each partner** and are coordinated.
- **Company** must take a **training commitment** which is suitable to convey the intended course content.
- Organization of the **theoretical and practical phases**, the conditions for an **acceptable total time load (ECTS)** for students.
- **Relationship of the three partners** (students, universities and companies) is **subject to mandatory regulations for quality assurance**.



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# 3. COMPARISON OF DATA – GERMANY (I)

- **DHE Programmes not unified.** Design and layout depend on discipline/occupation and approach of respective HEIs.
- Curricula offered in format of “**Curriculum Integrated**”, “**Work Integrated**” and “**Work based**” models
- DHE programmes at **Bachelor and Master level**.
- Programmes available **not only in technical disciplines** such as engineering, but also in fields such as **management, business administration and the health sector**.
- All programmes follow **Bologna criteria** (6 or 7 semesters for Bachelor programs (180 to 210 ECTS)) and 4 semesters for Master Programmes (60 to 120 ECTS).
- Graduates from DHE programmes have **full right to continue to Master degree and further to PhD** level.
- **Some technical study programmes aligned and combined with VET Programs.** In these cases, graduates obtain a HEI and VET degree and occupation.
- **Accreditation** regulated by law and carried out by the National Accreditation Agencies.

All programmes **developed jointly** by representatives of **HEIs and IPs**.



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### 3. COMPARISON OF DATA – GERMANY (II)

- **HEIs: lead in development and implementation of programs** - reflected also in the ratio between teachers from HEIs (60%) and IPs (40%).
- **EQF Level unified** with EQF 6 for Bachelor and EQF 7 for Master Programmes. Some programmes offer a VET degree at EQF 4 level.
- **IPs:** Besides **curriculum development and revision** also involved in **mentoring of final thesis** (co-mentoring with HEI mentor)
- **HEIs: overall responsibility for student assessments.** IPs: assessments related to practical part and not unified in terms of modalities and format.
- **Industry** offers training and in the case of DHBW programmes, a **working contract** for DHE students. **Some HEIs have framework contracts** with IPs and then with students (no direct IP-student contracts).
- In **some** HE-institutions, **first two semesters** carried out **only by HEIs**. Starting from the **3rd semester**, the educational process is **divided between HEIs and IPs** (50:50 at Bachelor level, 60:40% on Master level)
- **Teaching staff:** needs to have **relevant industry experience** and a **relevant academic degree**.

**Employment rates** after graduation: between 80 and 90%; **drop-out rates** between 5 and 20%.



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# COMPARISON OF DATA – GERMANY (I)

The **Framework for German Dual Higher Education programmes** outlines the following criteria:

- **Applicants** have to be **generally eligible for HE admission**.
- **Involvement of companies** in the recruitment process **has to be documented** and is **part of the accreditation**.
- **Bachelor programmes** last **three years** and offer **180 ECTS** credit points: **at least 120 ECTS** credit points for **theory** and **at least 30 ECTS** credit points for **practice**.
- There is a **clear relation between theory and practice** (academic relevance of practice has to be proven).
- The programme includes a **final thesis with 6-12 ECTS credit points**.
- The **overall annual working time of students** (academic workload for work and study plus any additional work for the company) has to be "**reasonable**" (no mentioning of an actual limit, information from some institutions indicate an average of around 2.000 hours per year, which is clearly more than the typical full-time employment).
- **Each faculty has to meet criteria for regular Universities of Applied Sciences**, e.g. at least **40 % of teaching** has to be provided by **employed professors**. The existence of a **quality management system** for the cooperation of the two different learning environments and of a well **described mentoring and counseling system** (during practise) for students has **to be proven**.



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### 3. COMPARISON OF DATA – SPAIN (I)

- DHE Programs might be **offered by different type of HEIs** (e.g. private and public).
- Program **design depends on discipline, future occupation and approach** taken by HEIs.
- DHE Programs offered in fields such as **Engineering, Education or Business Studies**.
- Curricula are offered in the format of “**Curriculum Integrated**”, “**Work Based**” and “**Work Integrated**” models.
- **Bachelor and Master DHE Programs** can be offered by all HEIs following the Bologna Model (8 semesters for Bachelor (240 ECTS)) and 2 to 4 semesters for Master Programmes (60 to 120 ECTS).
- DHE programmes are **not unified**.
- All graduates from DHE programmes have the **right to continue education** towards a Master degree and further to PhD level.
- Framework of **DHE programmes developed jointly by representatives of HEIs and IPs**. IPs are in charge of developing the set of competencies for the practical part

DHE programs are **jointly implemented by HEIs and IPs but led by the respective HEI** - ratio between teachers from HEIs and IPs: 50 to 75% HEIs versus 25 to 50% IPs (not formally established, but minimums defined for Basque Country).



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### 3. COMPARISON OF DATA – SPAIN (II)

- **Same ratio** applied for the involvement of HEI staff and IPs in **student assessments** (but not formally regulated)
- Involvement in **student assessments by IP is related to the practical part** of the education and not unified.
- **EQF Level is unified** and following the EQF scheme with EQF level 6 for Bachelor and EQF level 7 for Master Programmes.
- Common practice: **employment contracts between students and IPs or university-company collaboration agreements between HEIs and IPs**. No standardised employment contracts for DHE.
- **Accreditation** is regulated by law and carried out by the established Accreditation Agencies.
- **No special requirements for Teaching Staff** have been identified.
- **Employment rates**: not available for all programmes. Existing data indicate rates between 80 and 100 %), **drop-out rates** range between 20 and 36 %.



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## 4. CONCLUSIONS & RECOMMENDATIONS (I)

- DHE programmes need to consider the **Bologna requirements**. This is to enhance horizontal and vertical mobility and to simplify recognition of degrees. It also promotes trust by employers. Programmes should also clearly indicate the **relevant EQF level** (6 – BA, 7 – MA).
- DHE graduates need to have **full access to the next educational level** (e.g. MA, PhD) both at applied and scientific (non-dual) HE programmes.
- As and **where feasible** it can be considered to award a **VET degree** together with the BA.
- In term of the **dual approach** chosen, it is recommended to opt for **curriculum integrated or work-based models** since these approaches provide best for a systematic integration of work experiences.
- In terms of **contractual relations**, it is recommended for the IP to have **direct working contracts** with the student for the period of their practical work.



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## 4. CONCLUSIONS & RECOMMENDATIONS (II)

- **Relation theoretical and practical work:** It is recommended that on **BA level**, the **first 2 semesters focus on theoretical work** with first **work-based experiences from semester 3 to 6** (for example, 80:20/theoretical vs practical work). At MA level, the focus should be on the practical experiences in R&D and can be designed in different ways, depending on the fields of study and institutional framework. As a minimum, students should be required to carry out 60% of their study period with the IP doing practical work.
- **Mentors in companies** should receive **training** to get prepared for their role. Regular meetings between company mentors and HEI teaching staff are recommended (at least once or twice a year). **Obligations of companies and mentors should be openly discussed** and clearly defined.
- In terms of **curriculum development and revision**, teams should consist of **representatives both from HEIs and from industry** (suggestion: 50:50). It is also recommended that **IPs have at least 5 years of experience** in their respective field/discipline.
- **Both academic staff and IP partners should be involved in the teaching process.** It is recommended that **both should have industry experience**, but teachers from **IPs** should have approximately **5 years of prior industry experience plus a relevant academic degree** (at least MA).



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## 4. CONCLUSIONS & RECOMMENDATIONS

- **Assessment:** The **HEI should be primarily responsible** for the assessment of students but should request **inputs from IPs in line with an established reporting and grading system.**
- **Final thesis:** It is recommended for the final thesis to be **co-mentored by HEI and IP representatives.** The **IPs should grade the applied part** while the university takes responsibility for the academic and theoretical part. It is also **recommended for the HEI mentor to visit the company** before the student starts working on the thesis. It is **essential for HEI staff to get to know the respective companies,** to **meet mentors** and to develop and maintain personal contacts.
- At the **Ministry level,** there should be a **clear catalogue of criteria which outlines the requirements a study programme has to fulfil in order to be called "dual education in HE" (eg Austria, Germany).** Otherwise, the definition of what is DHE might get lost instead of branded. **Relevant legal frameworks need to reflect on DHE as needed.**



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## 5. MAIN REFERENCES

DUALSCI – STRENGTHENING CAPACITIES FOR IMPLEMENTATION OF DUAL EDUCATION IN BH HIGHER EDUCATION PROJEKT NO. 610251-EPP-1-2019-RS-EPPKA2-CBHE-SP (EU PROGRAM ERASMUS+, 2019-2022, <https://dualsci.unze.ba/project-results/>)

DUALSCI Review of best practices and experiences in DHE: ANALYSIS OF DUAL HIGHER EDUCATION STUDY PROGRAMMES IN AUSTRIA, GERMANY AND SPAIN; 20th September 2020

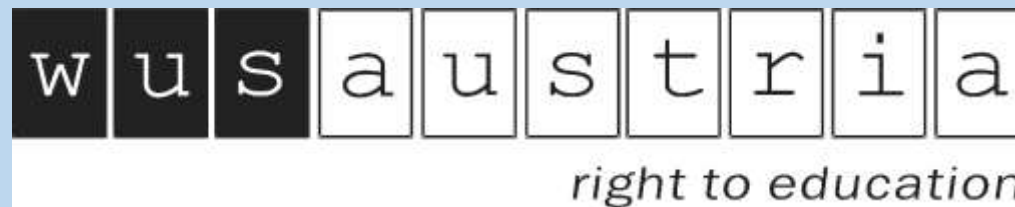
EU project ApprenticeshipQ; [www.apprenticeshipq.eu](http://www.apprenticeshipq.eu)

*The complete list of references can be found in the article.*



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# Thank you for your attention!!!



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