



The ESG as promoters of change in the European Higher Education Area – A workshop for QA practitioners

Different modes of delivery - Dual Education Programmes

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Cooperative
And
Work
Integrated
Education

What I will talk about

- FH JOANNEUM University of Applied Sciences
- Specific challenges for quality assurance within ESG 2015 related to „Cooperative and Work Integrated Higher Education“
- Introduction to „Dual“ / „Cooperative and Work Integrated Education“ (CWIE) Programmes
- Summary of opportunities and challenges

Our university in Graz, Austria



↓ **1626**

FIRST-YEAR STUDENTS

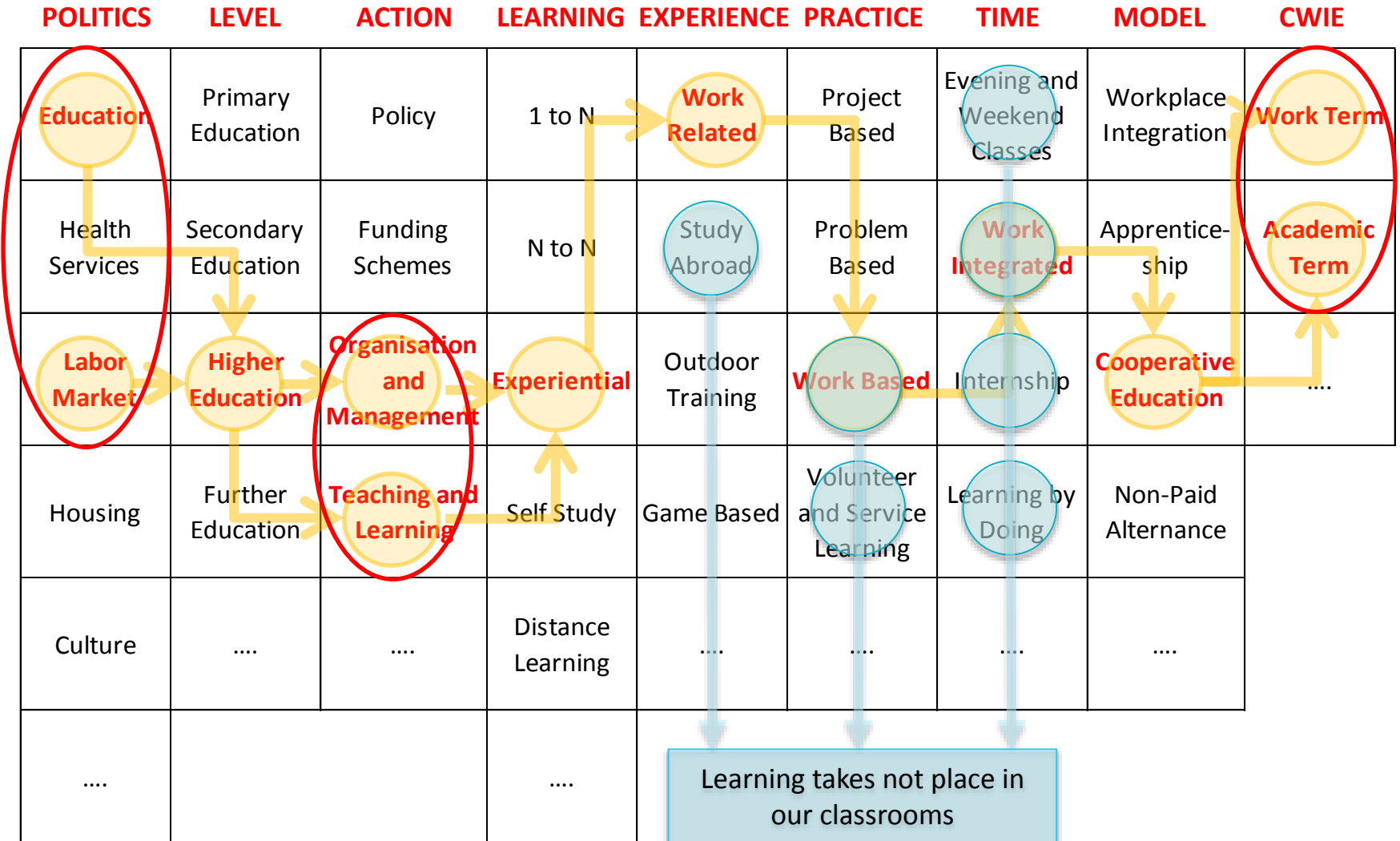
46 DEGREE PROGRAMMES

Departments	Bachelor degree programmes	Master degree programmes
APPLIED COMPUTER SCIENCES	3	4
ENGINEERING	5	4
HEALTH STUDIES	7	1
BUILDING, ENERGY & SOCIETY	3	4
MEDIA & DESIGN	3	4
MANAGEMENT	4	4
	25	21

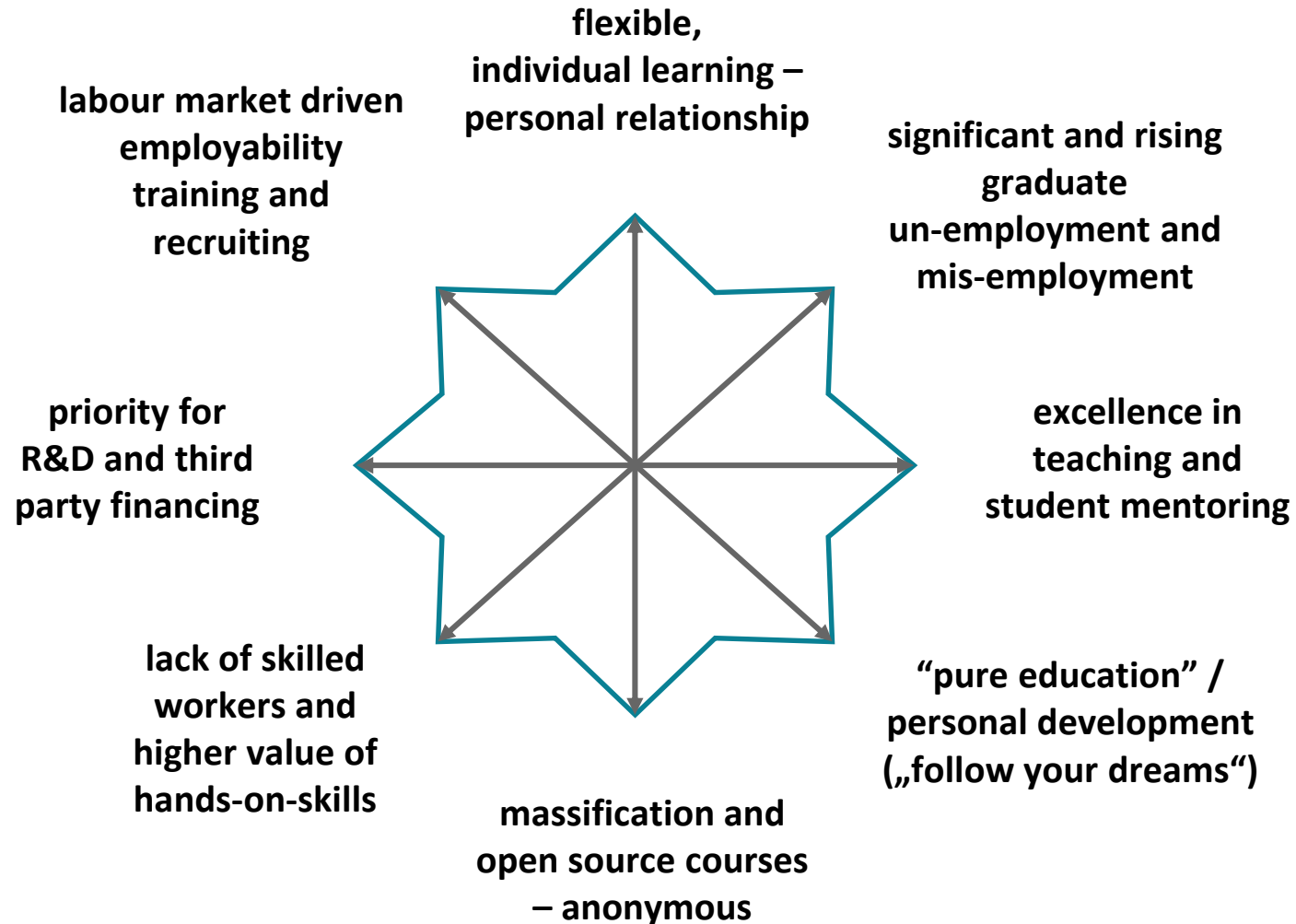


Specific Challenges for Quality Assurance within ESG 2015 related to „Cooperative and Work Integrated Higher Education“

Basic Framework of Cooperative and Work Integrated Education



Higher Education struggles with its position in society



ESG 2015 (1) – Relevance for Dual / Cooperative Education

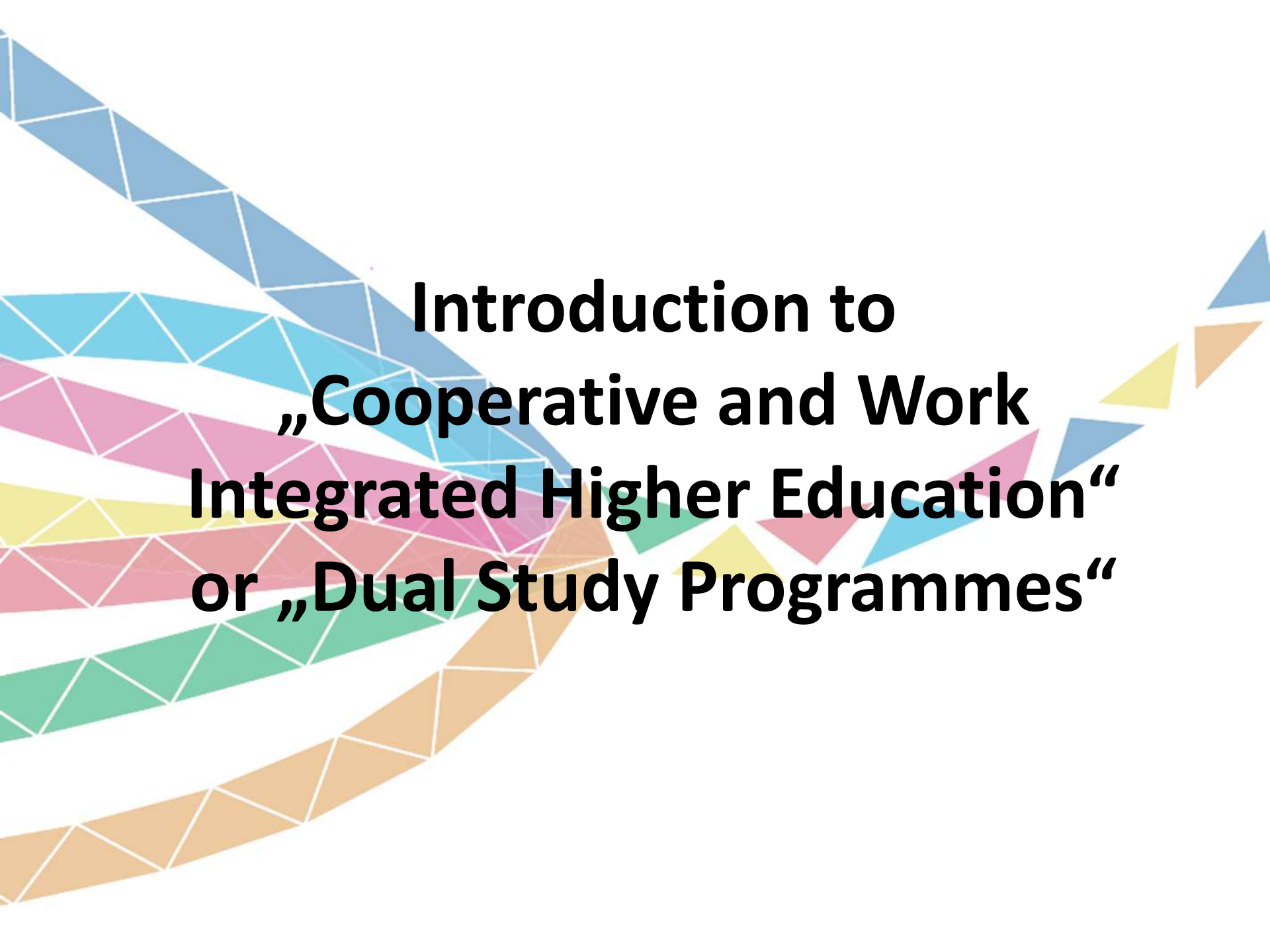
(Standards and Guidelines for Quality Assurance in the European Higher Education Area)

- **Context:** [...] Responding to diversity and growing expectations for higher education requires a fundamental shift in its provision; **it requires a more student-centered approach to learning and teaching, embracing flexible learning paths** and recognising competences gained outside formal curricula. Higher education institutions themselves also become more diverse in their missions, mode of educational provision and cooperation, [...]
- **Goals:** [...] preparing students for active citizenship, for their **future careers** (e.g. contributing to their **employability**), supporting their **personal development**, creating a broad **advanced knowledge base** and stimulating research and **innovation**. [...]
- **Quality:** [...] whilst not easy to define, is mainly a result of the interaction between teachers, students and the institutional learning environment. Quality assurance should **ensure a learning environment** in which the content of programmes, learning **opportunities and facilities** are fit for purpose. [...]
- **Four Principles of Quality Assurance:**
 - QA lies in the primary **responsibility of higher education institutions**.
 - QA responds to the **diversity of higher education** systems, institutions, programmes and students.
 - QA supports the development of a **quality culture**.
 - QA takes into account the needs and expectations of students, all **other stakeholders** and Society.

ESG 2015 (2) – Relevance for Dual / Cooperative Education

(Standards and Guidelines for Quality Assurance in the European Higher Education Area)

- **Design and approval of programmes**
 - [...] Programmes are designed by **involving students and other stakeholders** in the work.
 - Programmes **benefit from external experience** and reference points.
 - Programmes are designed so they enable **smooth student progression**.
 - Programmes define the expected student workload, e.g. in **ECTS**.
 - Programmes include **well-structured placement opportunities** where appropriate. [...]
- **Student-centered learning, teaching and assessment**
 - [...] Respects and attends to the diversity of students and their needs, enabling **flexible learning paths**.
 - Considers and uses **different modes** of delivery, where appropriate.
 - **Flexibly** uses a **variety of pedagogical methods**.
 - Regularly **evaluates and adjusts the modes of delivery and pedagogical methods**.
 - Encourages **a sense of autonomy in the learner**, while ensuring **adequate guidance and support** from the teacher. [...]
- **Information Management**
 - [...] Effective processes to collect and analyze information **about study programme and other activities** feed into the internal quality assurance system.
 - Information on: Key **performance** indicators, student **progression** and drop-out rates, students' **satisfaction**, learning **resources** and **support, career paths** of graduates.

The background features a complex, abstract geometric pattern composed of numerous overlapping triangles and lines in various colors including blue, light blue, pink, yellow, green, and orange. The pattern is dynamic and layered, creating a sense of depth and movement.

Introduction to „Cooperative and Work Integrated Higher Education“ or „Dual Study Programmes“

Experiential Education at FH JOANNEUM (1)

1. Full time programmes

1.1 Regular degree programmes **(no model fits all purposes!)**

- One internship (between fourth and sixth semester)
- Bachelor thesis in cooperation with companies (f.e. Industrial Management)
- Industrial Design (design competitions, varying incoming designers)
- Student companies (f.e. Information Design)

1.2 Work „enabling“ delivery **(pressure in this direction is rising!)**

- Maximum flexibility for individual attendancy and schedule generation
- Accreditation of prior and work based learning
- Master programmes (mature and self responsible students)

1.3 Dual study programmes (CWIE, Institute for Applied Production Sciences)

- **Hybrid model:** University of Cooperative Education Baden-Württemberg / North-American Model (first year full time + work contract with one company)
- 50 % Academic terms + 50 % Work terms
- Bachelor and Master

1.4 Health Sciences (f.e. Biomedical Laboratory, Physiotherapy, Dietetics and Nutrition, Nursing, Radiology)

- Former academies, only Bachelor **(discussion of added academic value / credibility)**
- Several short placements with specified tasks, **highly strutured and integrated**
- Non-paid, hospitals rely heavily on students

Experiential Education at FH JOANNEUM (2)

2. Part time programmes (**discussion on academic „honesty“ and workload**)

- Typically Friday, Saturday, sometimes additional evening and intensive weeks
- Credits for company **projects** (f.e. Industrial Management)
- Strong focus on **e-learning** (f.e. Software Design)
- Sometimes created specifically to offer higher education to typical professional fields with **instant needs** (f.e. software developers, bank and insurance employees)
- Employment (especially for **international students**) in R&D projects (f.e. Advanced Electronic Engineering)
- Efforts to include graduates from former (4-Year) Diploma programs

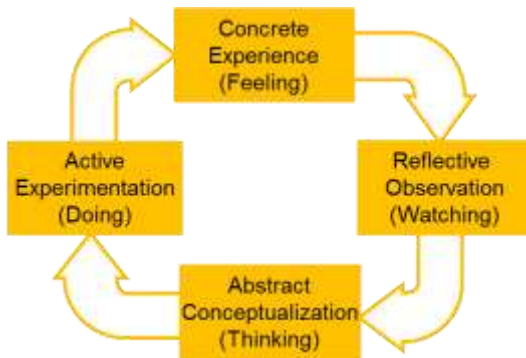
3. Accreditation of prior learning (**pressure in this direction is rising!**)

- Graduates from **Engineering and Business High Schools** (Austrian success story: practical training / internships / faculty with industry experience)
- **Adaptation of curriculum essential for quality**
- **Cooperation with schools as success factor**
- **Graduates from VET** accepted (if it covers the same topic and includes high school diploma equivalent additional exams in Mathematics, German and English)

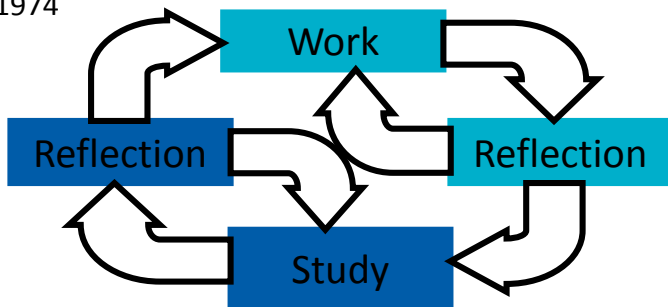
Introduction to Cooperative and Work Integrated Education

The core elements of CWIE are **the close and continuous cooperation between higher education and enterprises** and their representatives, and a wide range of **specific elements to integrate academic curricular and professional tasks** and temporary employment to form a unique and individual educational system for each participating student.

Experiential Education / Learning Cycle



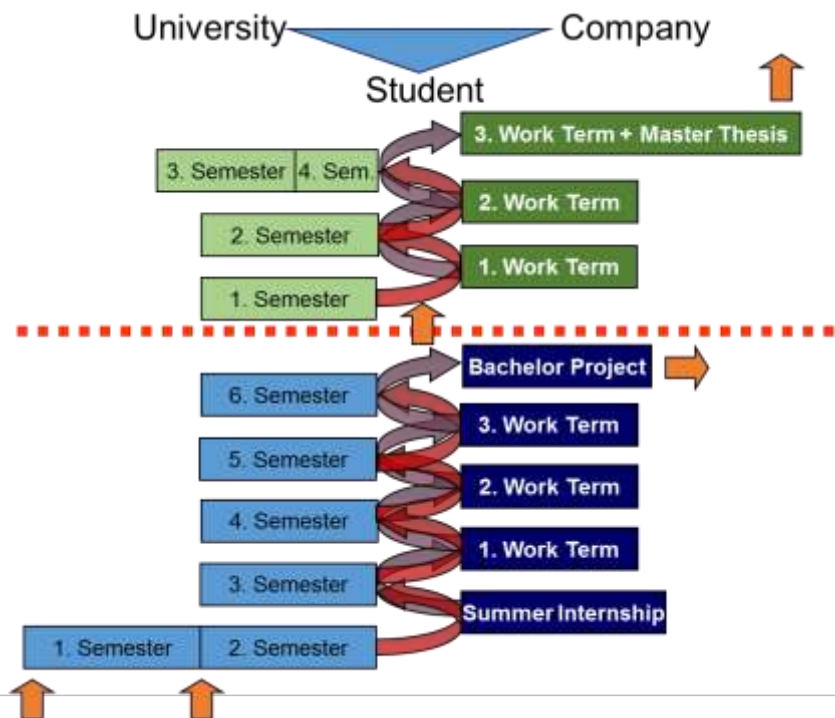
David Kolb, 1974



Work Study Rotation / Alternance / Dual Education

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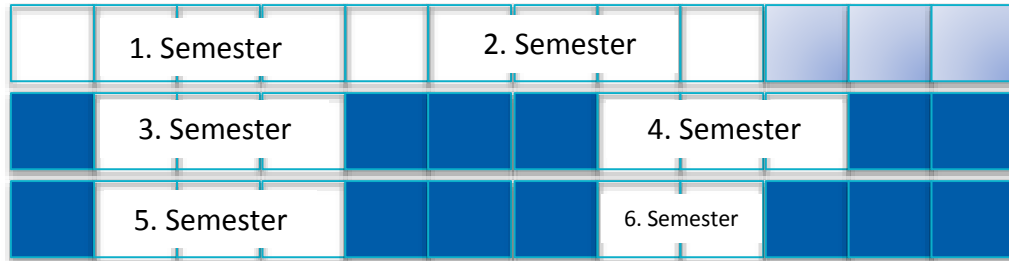
FH JOANNEUM – Production Technology and Organization



Johannes Haas

Rotation of Theory and Practice in the Degree Programmes of the Institute of Applied Production Sciences

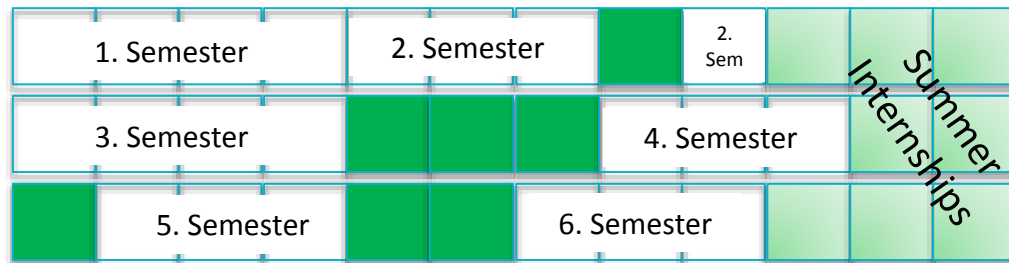
Production Technology and Organisation



Engineering and Production Management



Sustainable Food Management



Programme characteristic concerning cooperative elements

Production Technology and Organization

- 180 ECTS, „Full-Time-Dual“, Bachelor of Science in Engineering
- 25 Students per year, each of them with one company.
- Two year contract, salary € 700,- per month (14 per year)
- Importance of peer learning, mentoring and supervision.
- **Core competence = typical „trainee“ – knowledge of company.**

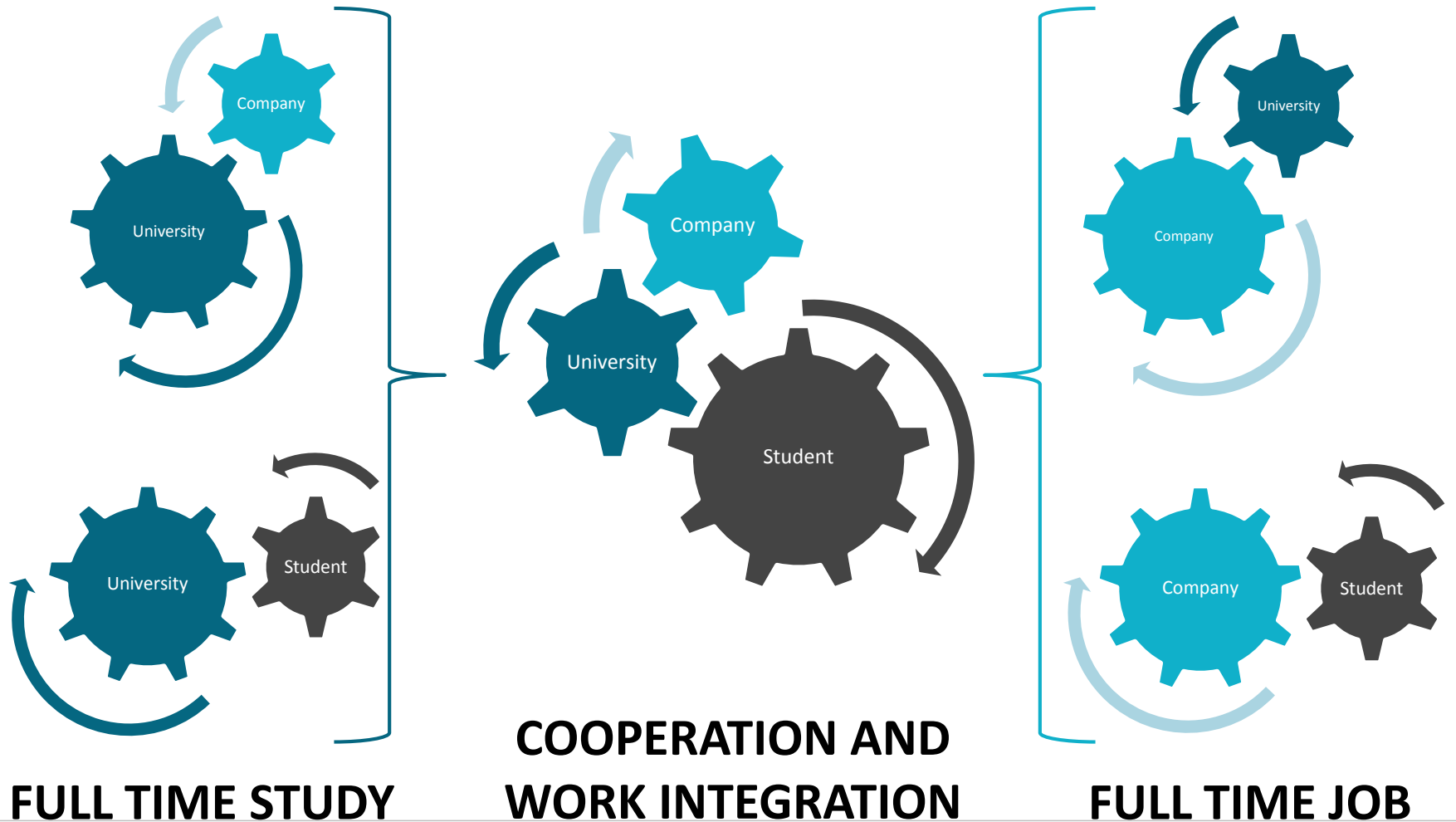
Engineering and Production Management

- 120 ECTS, „Part-Time-Dual“, Master of Science in Engineering
- 25 Students per year, company and contract from the start.
- Responsible „knowledge brokers“ for „their“ company.
- Differences in salaries („trainee“ – employed academic)
- **Core competence = R&D and innovation transfer.**

Sustainable Food Management

- 180 ECTS, „Full-Time-Coop“, Bachelor of Science in Engineering
- 25 Students per year, work terms along value chain in different companies. Flexible choice of employers.
- Employer networks in three fields (agriculture, processing, marketing and trade).
- **Core competence = range of experience along the value chain.**

The REAL Challenges of Cooperation



Characteristic differences between dual programmes

(A) Role of companies

STRONG („dual“ / Germany): Companies select and send students to university / academy

WEAK („coop“ / USA, Canada): Companies offer jobs for coop (usually four months) – students select and apply, work is integrated only into one course module

INTERMEDIATE (France, FH JOANNEUM): Companies select among available first year students

(B) Type of Rotation

Three to six months: f.e. USA, Canada, DHBW, FH JOANNEUM

Two to three days per week: IMH Elgoibar, Spain; Free University Bolzano, Italy

Wide variety of rotation systems: German „Duale Studiengänge“, French „Apprentissage par Alternance“

(C) Salary and legal issues

Distinct option for national apprenticeship system (France, Italy)

Apprenticeship parallel bachelor (several German universities)

Contract for one work term at a time or regular part time employee (f.e. 50 % position) for the duration of the programme

Retention provisions and additional contracts (f.e. university / company)

Distinct Features of Cooperative and Work Integrated Education

(1) Education

- Education is the key priority of the programme
- Application of curricular tools: faculty qualification, competency orientation, workload calculation, modularization, assessment
- Enterprise redefines itself as a learning and teaching environment
- Formal entrance requirements and final degree / possible job description

(2) Cooperation

- Partnership between educational institution and enterprises „at eye level“
- Defined tasks for partners with defined participation of the other
- Comparable supporting structures in both learning environments
- Open information on and clear allocation of cost elements

(3) Integration

- Creation of a distinctive educational culture with elements of work and study
- Facilitation of constant reflection in action / on doing
- Attempt to transcend all experience of students with the quality of work & study

What is fundamentally different?

1. Industry / companies are (should be?) stakeholders AND educators.
2. We create many and very diverse interfaces / transfer points in a degree programme.
3. Respective strengths, weaknesses, opportunities and threads of the joint effort become immediately visible.
4. **Students are (should be?) process owners of a 100 % individual path to graduation.**

QUALITY = COOPERATION + INTEGRATION + REFLECTION

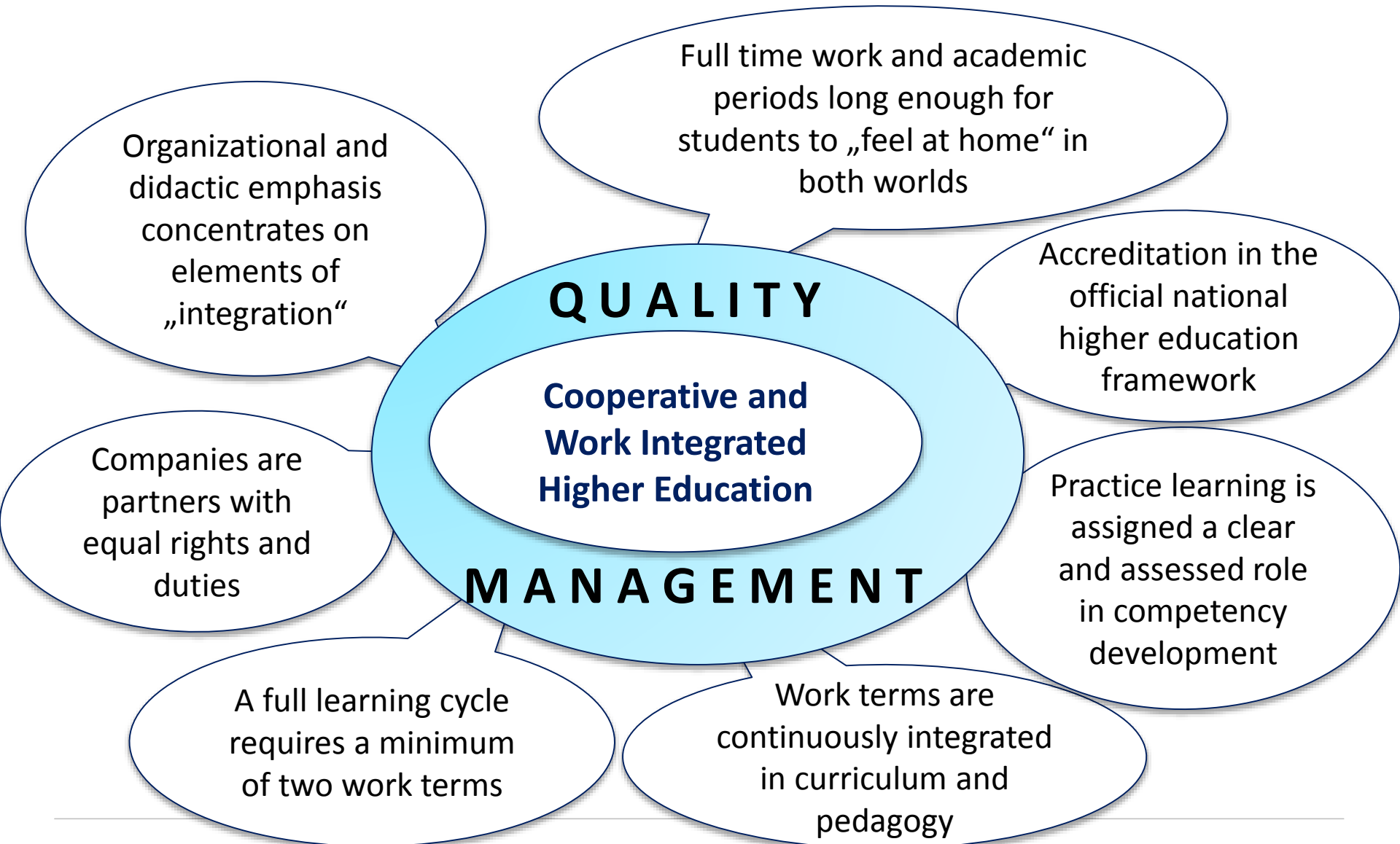
An abstract graphic composed of numerous small triangles in various colors (blue, cyan, pink, yellow, red, green, orange) arranged to form a large, fan-like shape that originates from the left and spreads out towards the right. The triangles are of varying sizes and are separated by thin white lines.

Summary of opportunities and challenges

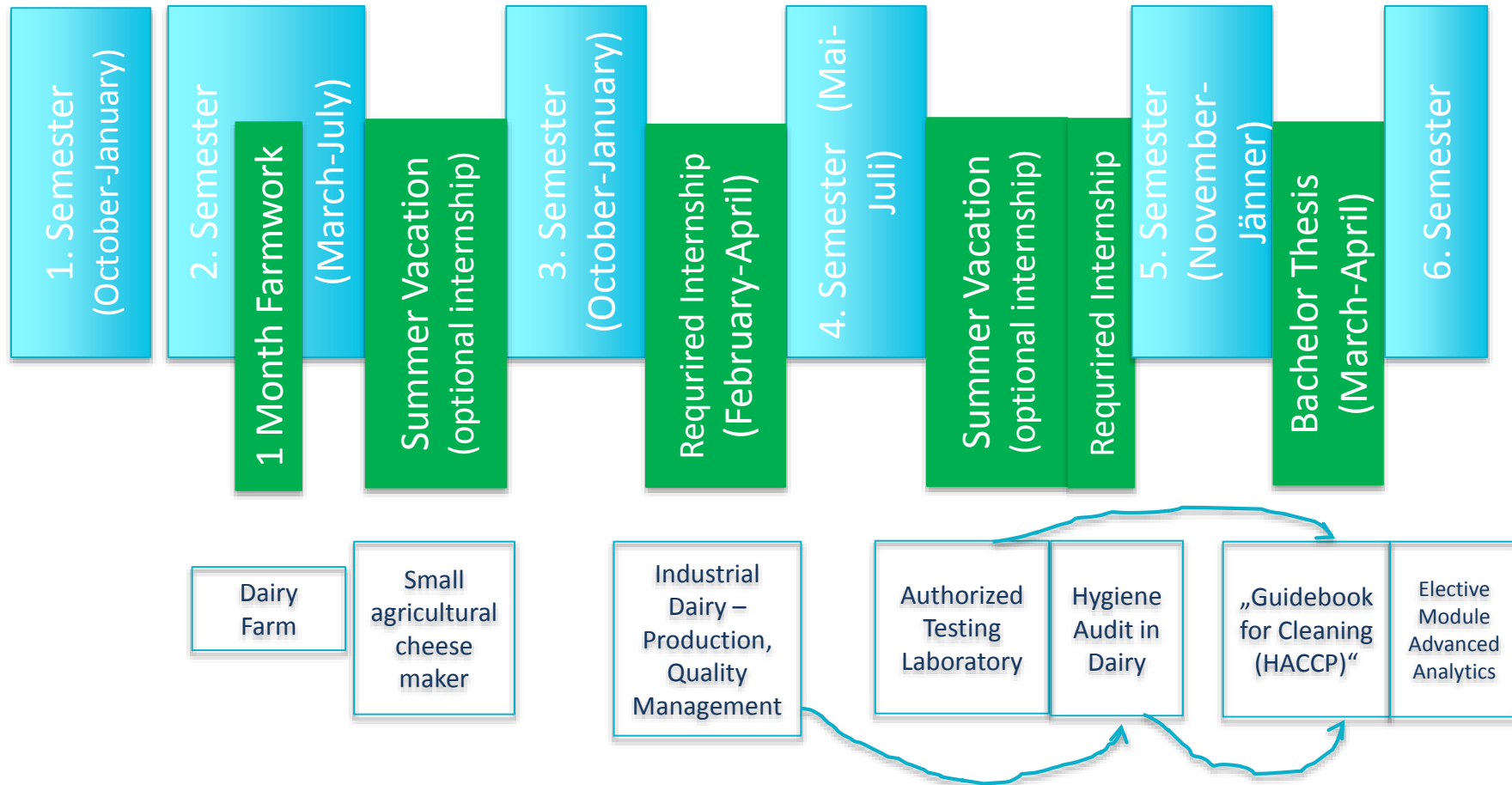
Summary of my message

1. There are many reasons for a **strong partnership between industry and universities** to deliver high quality and attractive work integrated education and a **large number of successful examples** exist worldwide.
2. **Higher education institutions** have to go through a transformation because programmes typically do not comply with all existing procedures and faculty members are not prepared for their additional role.
3. **Enterprises** have to go through a transformation to become effective learning environments and active academic partners.
4. **Students** must take responsibility for truly unique and individual learning experiences and learn to reflect on their progression.
5. **Part-time jobs** are created with direct influence of the labor market and CWIE shows potential to enhance **innovation** by cooperation with SME and start-ups.
6. By including employers directly into the design, organization and delivery of a degree programme **quality issues become more complex**.
7. Quality assurance is in the **responsibility of the higher education institution** and is at present neither well defined nor included in external and internal evaluation procedures for CWIE programmes.
8. Quality standards are necessary to allow for **smooth transition between CWIE and traditional higher education**, especially between bachelor (level 6) and master (level 7) programmes.

Recommendation from FH JOANNEUM experience

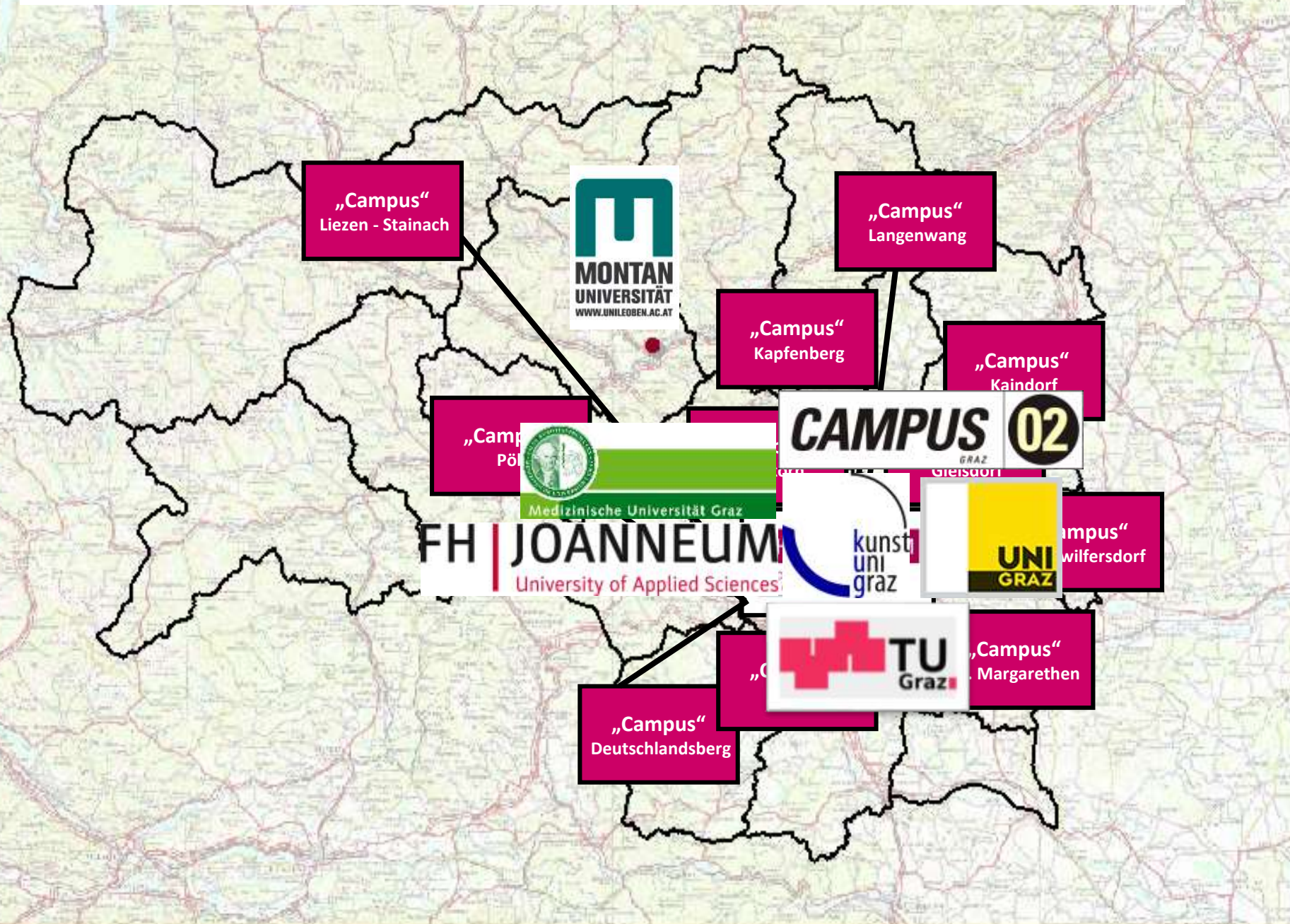


Individual career development through choice of internships



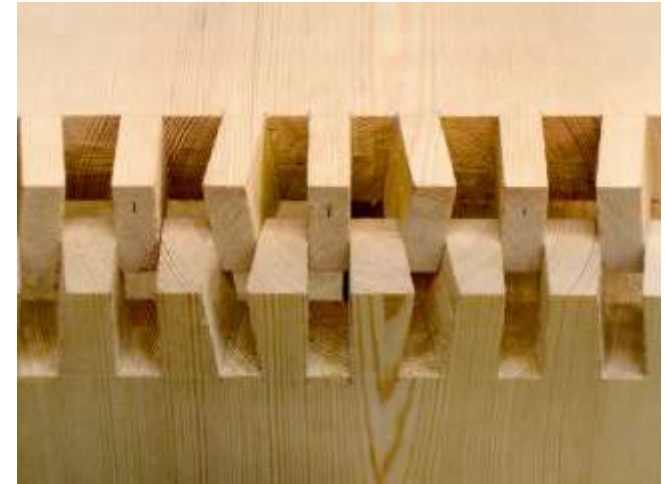
Example Sustainable Food Management: Hygiene management in large dairy

„Campus“ locations of higher education institutions in Styria



HIGH QUALITY LEARNING by INTEGRATING WORK and EDUCATION

**„Tell me, and I will forget.
Show me, and I may remember.
Involve me, and I will understand.“**
(Konfuzius, 500 BC – Brain Science, 21. Jhdt)



Quality of Contact and Bonding



Quality of Balance



Quality of Cooperation and Coordination

Additional optional input in breakout session

- Account of 15 years pioneering experience in design, delivery and evaluation.
- Insight into curricular and organizational details and documents concerning a CWIE programme.
- Examples of student professional learning goals and outcomes, work term reports, reflective diaries, bachelor thesis.
- Current strategic issues in Austria and globally.
- Collection of helpful resources in the world wide web.

Thank you for your attention!

Further Information:

johannes.haas@fh-joanneum.at

www.fh-joanneum.at/pto

www.cwihe.com (Erasmus +): We will organize an open institutional partner workshop and study tour on September 15th and 16th in Graz

www.waceinc.org

Look at the overall framework for dual study programmes

- The integration of work place experience has become an important element of diversification of higher education – the necessary framework for quality management and quality assurance is underdeveloped.
- Dual („Cooperative and Work Integrated“) learning is a specific representation of „experiential learning“ (David Kolb, 1974)
- Dual higher education is rooted in history: Apprenticeship in Germany and Austria; Herrmann Schneider, University of Cincinnati, 1906; Berufsakademie / University of Cooperative Education Baden-Württemberg, 1974 – www.dhbw.de)
- Multitude of organizational models (f.e. role of companies, principle of work / study rotation – www.duales-studium.de > 200 HEIs, > 600 Study programmes; www.alternanceemploi.com > 400.000 students in France)
- International networking (f.e. WACE – www.waceinc.org , links to CEDEFOP (www.cedefop.europa.eu))
- Trends: Academic un-employment and mis-employment; „War for Talent / Strategic Recruiting – ALDI / Hofer“, New proof from brain science for an old truth – „There is no shortcut to experience!“

„Quality“ from the perspective of a University (of Applied Sciences)

- Applicants (number and quality / attractiveness)
- Infrastructure requirement and cost (per student)
- Low drop-out rate / high retention (also for alumni)
- Labor market success of alumni
- Revenues from R&D and other projects, publications
- Interest in and added value of cooperation with industry
- Positive presence and acceptance in media and political discourse
- Interest of other national and international universities in setting up and sustaining cooperation

„Quality“ from the perspective of a student

- Guarantee of promised education (competence development)
- Availability of attractive employers in the vicinity (of the university or home town)
- Interesting tasks / work with adequate salary
- Secure job with guarantee of future employment (without matching personal commitment)
- Labor market success and attractiveness as a graduate also for other companies
- Accreditation of prior learning and access to graduate programmes and further education
- Opportunity to spend time abroad (preferably in the US or in Australia...)

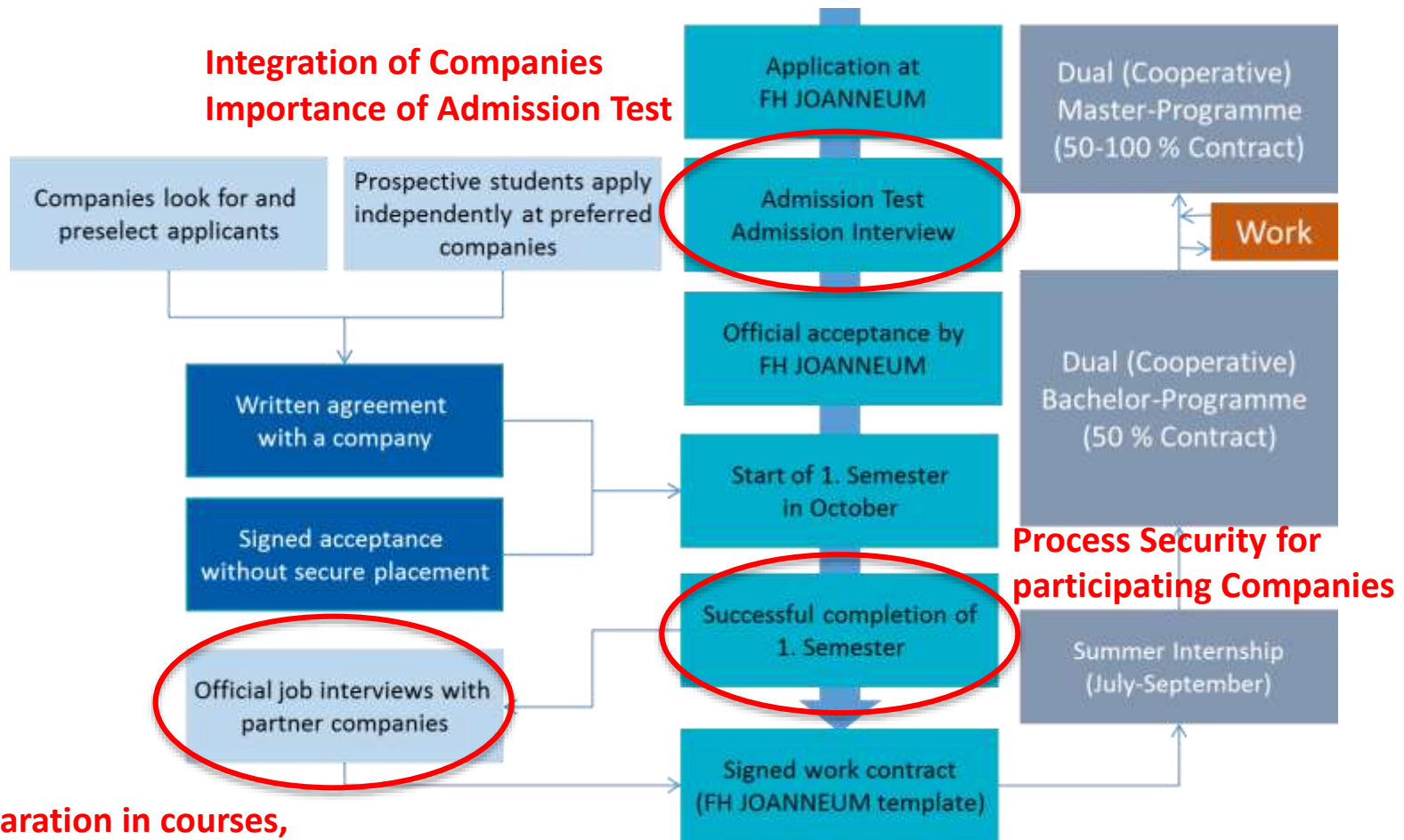
„Quality“ from the perspective of the companies

- Applicants – Numbers and job readiness / attractiveness
- Simple organization of cooperation (...should not be noticeable)
- Return of investment of engagement
- Far reaching influence on training / adaptation to company needs
- Flexible handling of company interest in case of conflict (f.e. student availability)
- No commitment towards student (or university) concerning longterm employment (but of course vice versa)
- Clear model (single track diploma degree favoured over two step bachelor and master)

The background features a complex, abstract geometric pattern composed of numerous overlapping triangles in various colors including blue, cyan, magenta, yellow, red, green, and orange. The pattern is dense on the left side and tapers off towards the right, where it transitions into a series of larger, more distinct triangles that appear to be flying or moving away from the center.

Additional Slides

Re-Accreditation 2011: Diploma → Bachelor + Master (2)



Preparation in courses,
excursions and guest lectures

Re-Accreditation 2011: Diploma → Bachelor + Master (3)

Reflection of all Reflections of previous
 through work to be documented

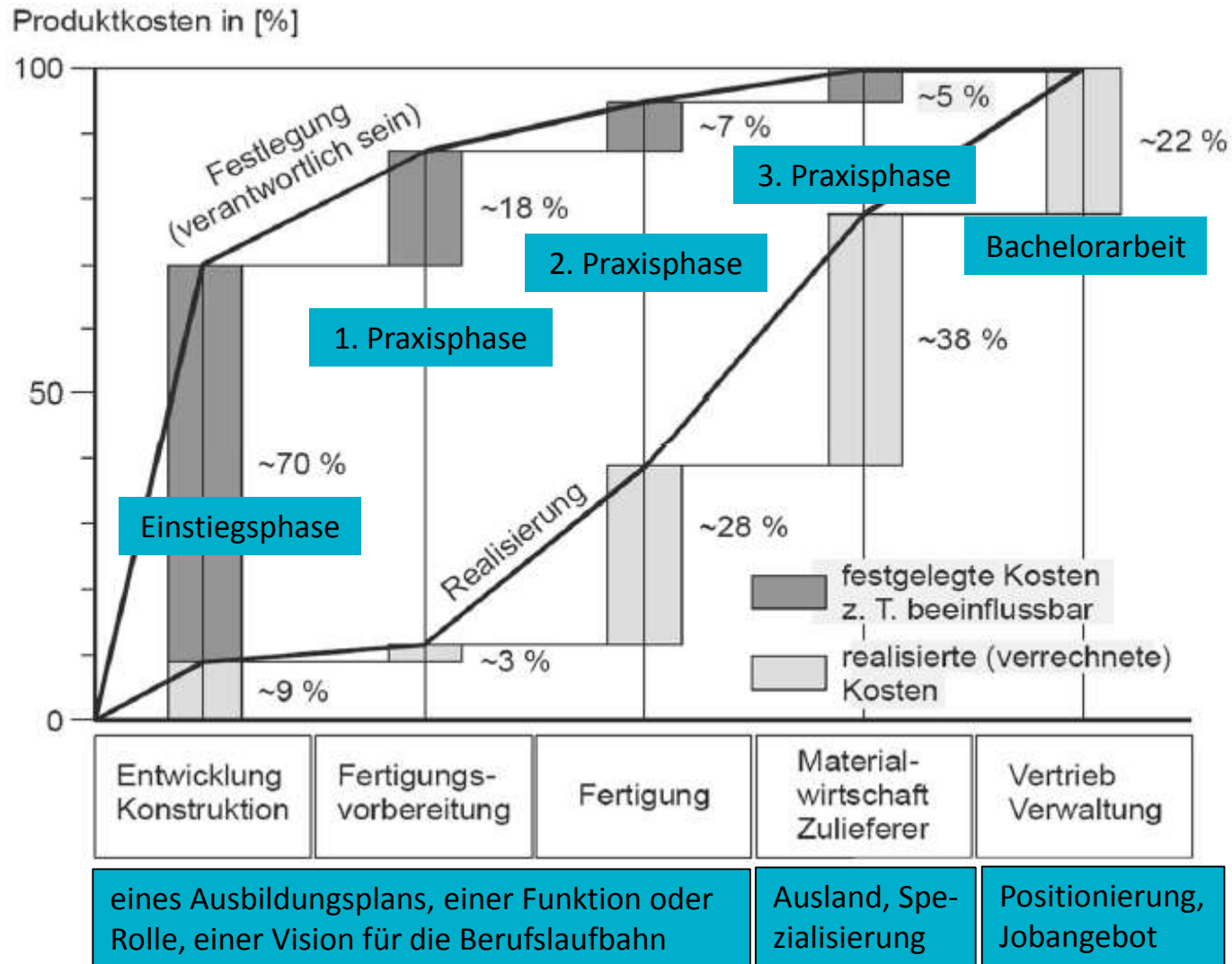
6. Semester

LV-Nr	LV-Bezeichnung	LV-Typ	SWS	Anzahl Gruppen	ASWS	ALVS	Modul	ECTS
PO4FAC	Facility Management	ILV	2	1	2	30	PO4	2
PO4QUM	Qualitäts- und Umweltmanagement 4	ILV	2	2	4	60	PO4	2
PO4BP	Betriebspraxis Produktionsorganisation 4	BP	0	1	0	0	PO4	1
PAPPS	Produktionsplanung und -steuerung 2	UE	1	1	1	15	PA	1
PAPRO	Produktionsautomation Projekt	UE	2	2	4	60	PA	4
BP4ENG	Professional English 4	SE	2	2	4	60	BP4	1,5
BP4KOM	Professional Practice and Communication 4	SE	1	1	1	15	BP4	1
BP4BA1	Bachelorarbeit 1	BP	0	1	0	0	BP4	2,5
BA2PRO	Bachelorarbeit 2	BP	0	1	0	0	BA2	8
BA2SEM	Seminar zur Bachelorarbeit	SE	1	1	1	15	BA2	2
Fokus	Fertigungstechnik							
PT4aNC	NC/CNC und CAM	ILV	2	1	2	30	PT4a	2
PT4aWM	Werkzeugmaschinen	ILV	2	1	2	30	PT4a	2
PT4aBP	Betriebspraxis Produktionstechnik 4 - Fertigungstechnik	BP	0	1	0	0	PT4a	1
Fokus	Verfahrenstechnik							
PT4bAB	Anlagenbau	ILV	2	1	2	30	PT4b	2
PT4bPT	Prozessleittechnik	ILV	2	1	2	30	PT4b	2
PT4bBP	Betriebspraxis Produktionstechnik 4 - Verfahrenstechnik	BP	0	1	0	0	PT4b	1
Summenzeile:			15		25	375		30
LVS = SummeSWS*LV-Wochen			225					

Quality assurance through didactic elements – directly integrated into the dual organizational framework

- Ongoing module **Professional Practice / Work Term Supervision**
- **10 ECTS for defined topics in core modules** and assessed by professor (standardized documentation – „Practice Module Report“)
- Definition of work assignments in **faculty visits** (rough overall plan, specific plans for each work term, definition and planning of final thesis; options: mentoring by defined faculty member / planned changes)
- **Work Term Report and Diary**, ongoing work with personal learning objectives and reflection (on doing)
- **First Bachelor Thesis** = Summary and reflection of practical (work) competence development
- Regular **guest lectures** delivered by programme alumni
- Annual „**Students‘ Conference**“ with company participation
- Joint supervision and assessment of **Second Bachelor Thesis**

Karriereplanung



Workload im Bachelorstudiengang Produktionstechnik und Organisation

Tätigkeit	Workload (h)	CP	Anteil (%)		Wochenarbeitszeit (h)
			Ohne Arbeit	Mit Arbeit	
Lehrveranstaltungen	1536	61,44	34,1%	26,0%	43
Lernen und Projekte an FH	2251,5	90,06	50,0%	38,1%	
Projekte im Betrieb	712,5	28,50	15,8%	12,1%	40
Arbeit ohne direkten Bezug zur Lehre	1407,5	0,00	0,0%	23,8%	
Summe	5907,5	180,00	100,0%	100,0%	

1/3 Modulbezogen; 1/3 Basisausbildung, Bericht, Reflexion; 1/3 2. Bachelorarbeit

Strategic issues of overall expectations of society towards the contribution of universities – ongoing discussion of roles

- **Tensions between two political positions:** Public money for corporate training and further education vs. Private sponsoring / co-financing of public educational duties.
- **Position of a dual programme within the university** (f.e. visibility: How to „market“ – internally and externally – a „plus“ of practice?)
- **Special characteristic of target groups for dual education** (**Ideal** for technical college graduates? **Opportunity** for general high school? **Continuity** of apprentices? **Alternative** to part time study for working people?)
- **Marketing and student acquisition** (f.e. Market job perspectives or enhanced learning? Companies either do it all or nothing. Importance of youth networks and alumni).
- **Ongoing cooperation with alumni** (Job platform, guest lectures and company supervisors, programme design committee, missionaries)

Quality issues in programme development

- **Curriculum definition and assessment of demand** (Which profile of competences does require integration of work experience and cooperation with industry? Which field of industry is willing to enter in a sustainable educational cooperation and / or to hire students?)
- **Application and accreditation** (Full time or part time? Representation of industry AND workers / unions in accreditation body? Does a legally accepted contract template exist? Assignment of credits for work / learning at company? Documents on criteria for company selection and for work assessment?)
- **Creation of a network of employers** (Size, distance, suitability e.g.; importance of personal relations and commitment of faculty; general economic situation)
- **Reaccreditation and sustainable development** (Procedure? Opportunity for improvement, inclusion of all stakeholders – examples at FH JOANNEUM, f.e. change to bachelor / master, outlook)
- **Exchange of experience** (other universities, working groups within the national agency, national and international associations)

Quality issues in programme delivery

- **Admission** test and interview, integration of companies
- Experience of the **first year as transition period** (f.e. misunderstanding of challenges) – change to full time
- **A new and unconventional model is not easy to communicate** (one year full time, „test“ internship, 48 months contract, defined practical elements, outlook to graduate programme)
- Time table for **presence and absence** (efficient use of facilities, provisions for flexibility – „five day pot“ for corporate projects / training per semester)
- **Time and test management** (problems with test repetition during work terms, consequence of failed courses)
- **Faculty work load** (four semester hours assigned for work term supervision, main topic = bachelor thesis)
- **Role of supervisors in companies** (technical – human resources – mentoring, standardized evaluation sheet – annual meeting)

Using reflection of work place requirements to start a continuous improvement process for the curriculum

Aim & Methods

The projects aim was to understand how the student view their first COOP- period and to use findings for curriculum development.

85 (three cohorts 2011 – 2013) 2nd semester students list their highest priorities for personal learning during their first work term with the future employer (Assessment Instrument from: Cates, C. and Cederkreutz, K., Leveraging Cooperative Education to guide Curricular Innovation, University of Cincinnati, 2008).

Students and teacher analyzed the results together in the course “Reflection of Professional Practice”.

Ranking of learning outcomes for the first work term by students (1)

CATEGORY		LEARNING OBJECTIVE		
A	COMMUNICATION	Speaks with clarity and confidence		71 %
		Writes clearly and concisely		
		Makes effective presentations		
		Exhibits good listening and questioning skills		
B	CONCEPTUAL AND ANALYTICAL ABILITY	Evaluates situations effectively		68 %
		Solves problems / makes decisions		
		Demonstrates original and creative thinking		
		Identifies and suggests new ideas		
C	LEARNING / THEORY AND PRACTICE	Learns new material quickly		36 %
		Accesses and applies specialized knowledge		
		Applies classroom learning to workplace situations		
D	PROFESSIONAL QUALITIES	Assumes responsibility / accountable for actions		39 %
		Exhibits self-confidence		
		Possesses honesty / integrity / personal ethics		
		Shows initiative / is self-motivated		
E	TEAMWORK	Demonstrates a positive attitude toward change		43 %
		Works effectively with others		
		Understands and contributes to the organization's goals		
		Demonstrates flexibility / adaptability		
F	LEADERSHIP	Functions well on multidisciplinary team		64 %
		Gives direction, guidance and training		
		Motivates others to succeed		
G	TECHNOLOGY	Manages conflict effectively		32 %
		Uses technology, tools, instruments and information		
		Understands complex systems and their interrelationships		
H	DESIGN AND EXPERIMENTAL SKILLS	Understands the technology of the discipline		32 %
		Displays the ability to design a component, system or process		
		Demonstrates ability to design and conduct experiments		
I	WORK CULTURE	Analyzes and interprets data efficiently		46 %
		Understands and works within the culture of the group		
		Respects diversity		
J	ORGANIZATION PLANNING	Recognizes political and social implications of actions		46 %
		Manages projects and / or other resources effectively		
		Sets goals and prioritizes		
		Manages several tasks at once		
K	EVALUATION OF WORK HABITS	Allocates time to meet deadlines		46 %
		Professional toward work assigned		
		Quality of work produced		
		Volume of work produced		
		Attendance		
		Punctuality		

Ranking of learning outcomes for the first work term by students (2)

Ranking	Learning Outcome	Priority
1	Speaks with clarity and confidence	71%
2	Solves problems / makes decisions	68%
3	Manages conflict effectively	64%
4	Manages projects and / or other resources effectively	46%
4	Quality of work produced	46%
6	Works effectively with others	43%
7	Shows initiative / is self-motivated	39%
8	Accesses and applies specialized knowledge	36%
9	Understands complex systems and their interrelationships	32%
9	Analyzes and interprets data efficiently	32%
9	Sets goals and prioritizes	32%

Personality development

(Ranking 1-3)

Quality of work

(Ranking 4-6)

Individual role as a knowledge broker

(Ranking 7-9)

Conclusion

Students in their second semester of the coop program „Production Technology and Organization“ already have a clear perception of what „work integrated learning“ will mean for them during the upcoming first work term at the coop employer.

By selecting from a list of criteria of professional competences students place highest emphasis on **personality development**, followed by **work quality** and their **role as experts** with a university background to generate new knowledge for their companies.

Translating these findings into curricular activities and organizational practices yields the following recommendations:

- Start early with course design and assignments that **reflect and train key competencies** needed for a good start in the company.
- Provide **support and mentoring** for students in their role as mediators between company and university. This should be an ongoing partnership starting with the application process and following through until a final thesis or project.
- Constant **personal and team reflection** is a key to actual „integration“ of work and study and helps make the most not only of personal experiences but also of the variety of specific situation encountered by students of one cohort.