



Pädagogische
Hochschule
Steiermark

Developing Competences in Vocational Education The Learn&act Project

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Agenda

- Austria's specific situation in terms of vocational education
- The Learn2act Project
 - Developing student's competences to make them fit for vocational tasks
- The Learn&act Project Action Research
 - Teacher students reflect teaching methods



| | Total ISCED 3 | ISCED 3 GEN | in % | ISCED 3 PV | in % | ISCED 3 VOC | in % |
|---------|---------------|-------------|------|------------|------|-------------|------|
| EU-27 | 20,633,767 | 10,946,188 | 53.0 | : | : | 9,687,579 | 47.0 |
| Austria | 390,882 | 88,835 | 22.7 | 24,044 | 6.2 | 278,003 | 71.1 |

Note:

GEN = general education, PV = pre-vocational programme,

VOC = vocational education and training

Source: Eurostat, date of extraction: 19 May 2011

High Acceptance

| Country | ISCED 0 – 2 (in %) | ISCED 3 – 4 (in %) | ISCED 5 – 6 (in %) |
|----------------|--------------------|--------------------|--------------------|
| Czech Republic | 11 | 77 | 13 |
| Slovakia | 13 | 74 | 13 |
| Poland | 16 | 68 | 16 |
| Austria | 20 | 63 | 18 |
| Germany | 17 | 60 | 24 |
| UK | 15 | 53 | 28 |
| France | 34 | 41 | 24 |
| Spain | 54 | 19 | 27 |
| Portugal | 54 | 13 | 23 |
| EU 25 | 32 | 47 | 21 |

Table 1: Population of 25- to 64-year olds based on their highest educational level in Austria and other selected EU countries

Austrian vocational education in the European context

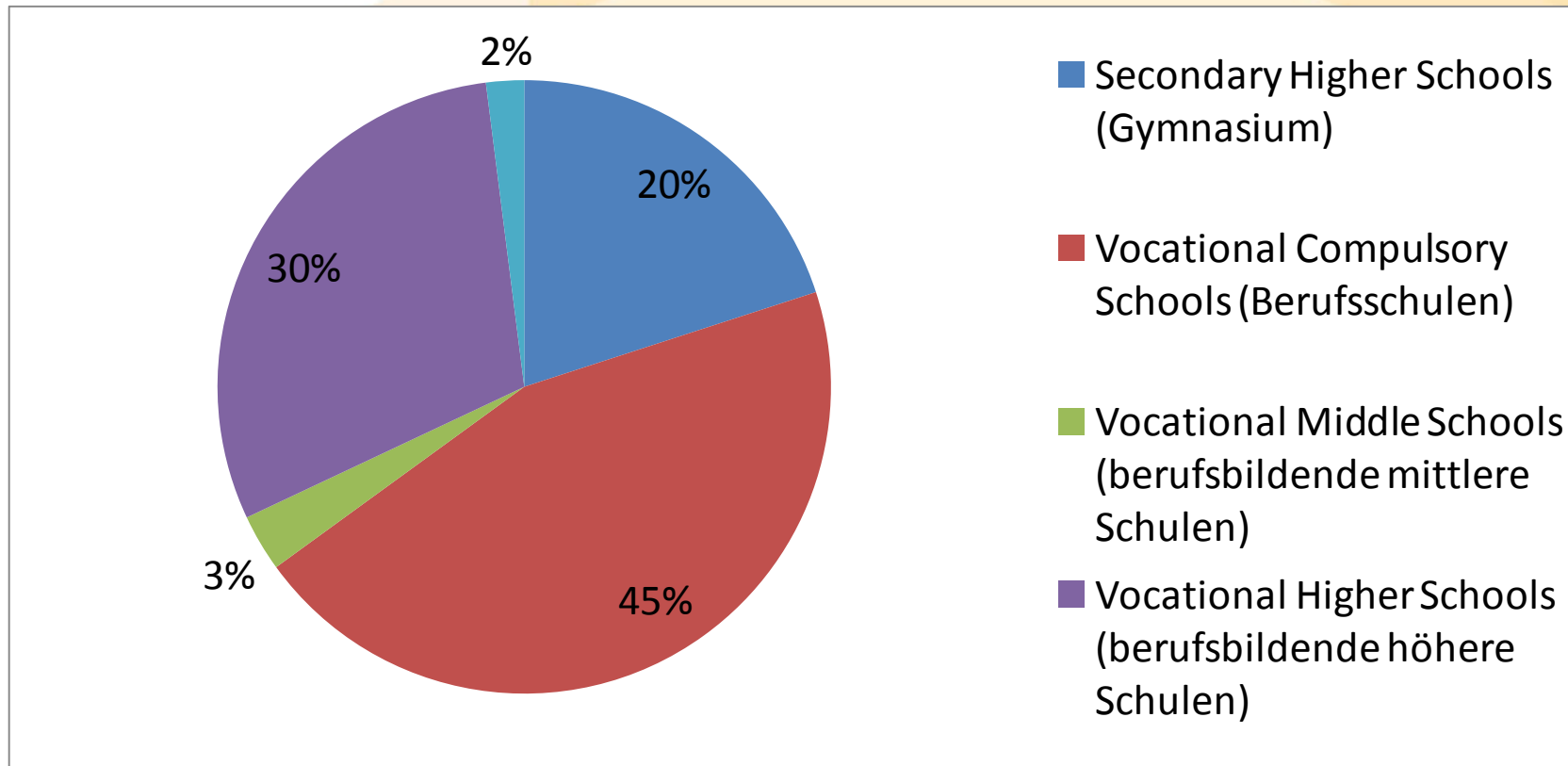
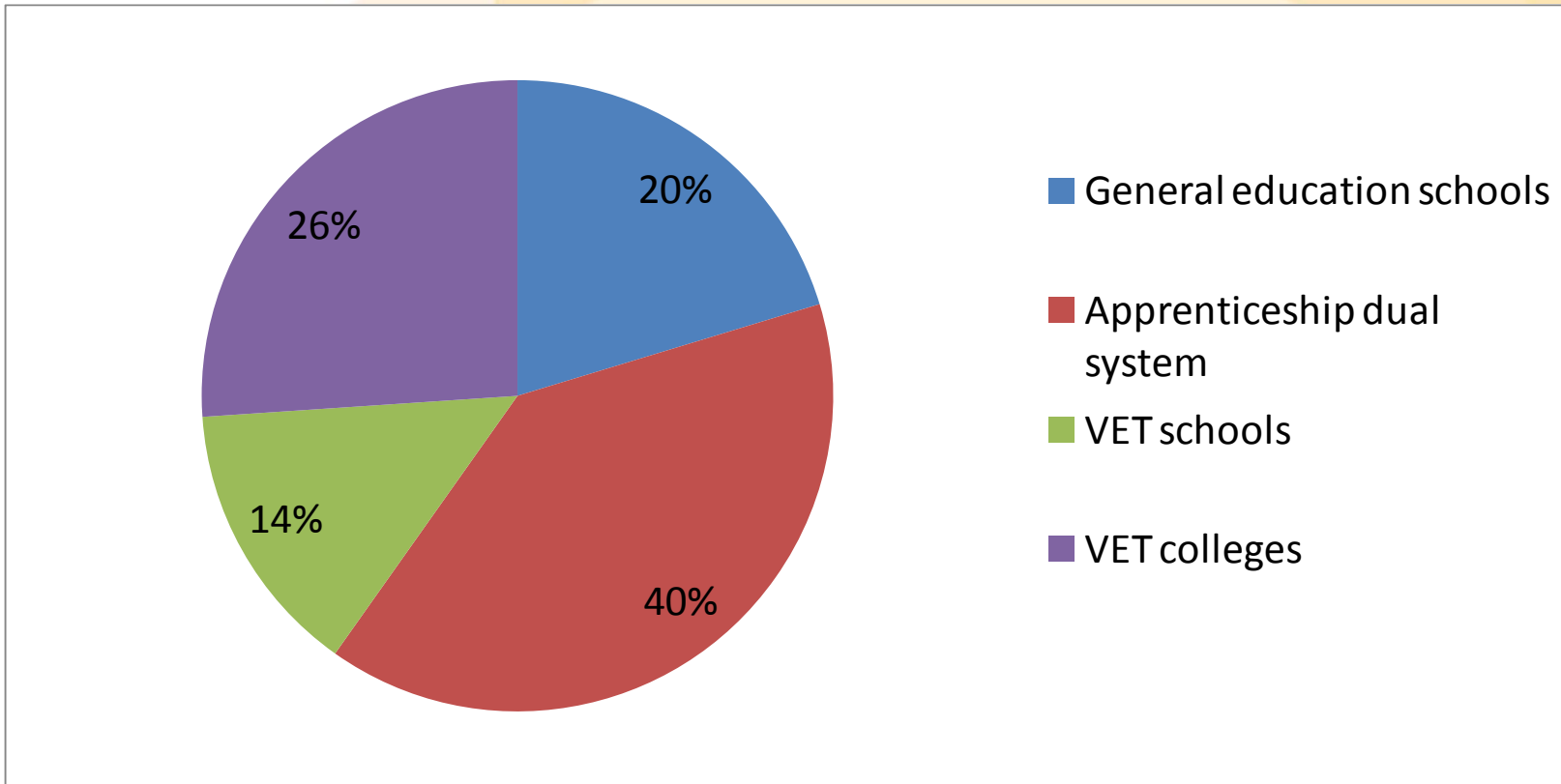


Figure 1: Distribution of students (age 16) in different school types in 2006

Austrian vocational education in the European context



Share of learners in the tenth year by educational programmes, school year 2008/09 (in %)

Source: Statistics Austria

| School Types | Grade | Age of Students | ISCED Level and Certificate |
|---|---|-----------------|-----------------------------|
| General Higher Secondary School (Gymnasium) | 9 to 12 | 14 to 18 | ISCED 3A maturation exam |
| Vocational Schools in dual system | <p style="text-align: center;">Differentiation</p> <p style="text-align: center;">Combination of general education and specific professional education</p> <p style="text-align: center;">Permeability</p> | | |
| Vocational Schools | | | |
| Vocational Colleges | | | |

Educational structure on secondary level II in Austria, CEDEFOP, 2006

Structure of vocational schools



***Specific
didactic approaches***

- Case enterprises
- Work assignments in co-operation with enterprises => project work
- Placements in enterprises
- Situated Learning in dual system



**Professional
Standard
situations**

**Competences
strengthened
by the concept of
activity-orientation**

**Development of
specific competences**

The Learn2act Project



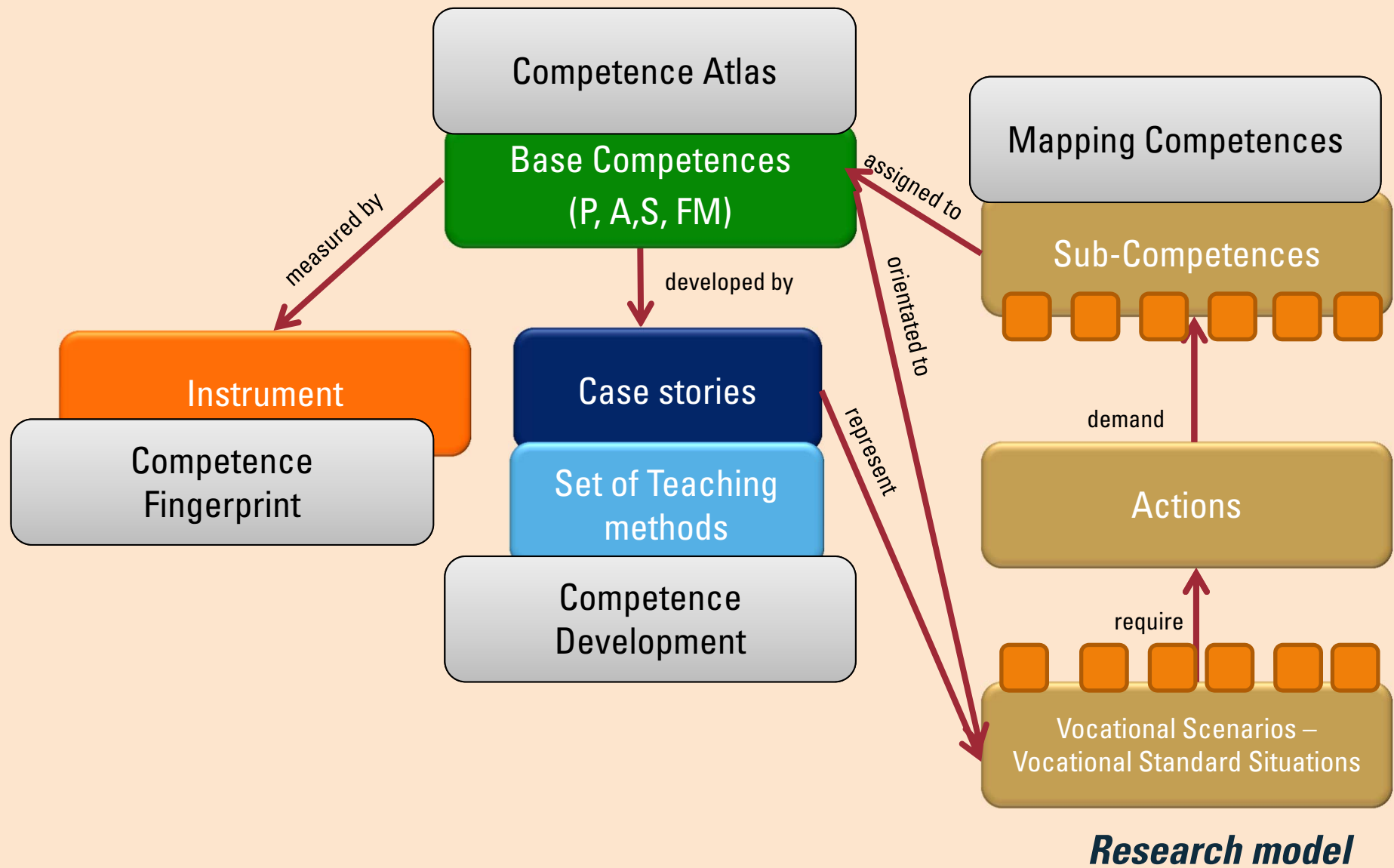
The Learn2act Project Questions

- Which sub-competences are expected by alumni of vocational schools?
- How can this sub-competences be measured?
- How can teachers support the development of students' sub-competences?



***The Learn2act Project
theoretical approaches***

- **Approach 1: Competence models**
Chomsky – competence and performance
Haken – predictable factors of competence
Erpenbeck/von Rosenstiel – autonomy
- **Approach 2: Situated Learning**
Lave/Wenger – situation as a central dimension of learning
- **Approach 3: Concept of activity-orientation**
Mertens – key qualifications
Reetz – vocational acting competence
Czycholl – cyclic structure of learning: orientation and defining aims, planning, acting, feedback and evaluation



Didactic materials:
self-assessments
case stories
strategies
teaching methods

28 experts => group discussions =>
31 sub-competences
40 experts' interviews about relevance of sub-competences
in professional standard situations

Theoretical models in context of the research questions =>
dimensions:
professional standard situations
options of acting in standard situations
sub-competences



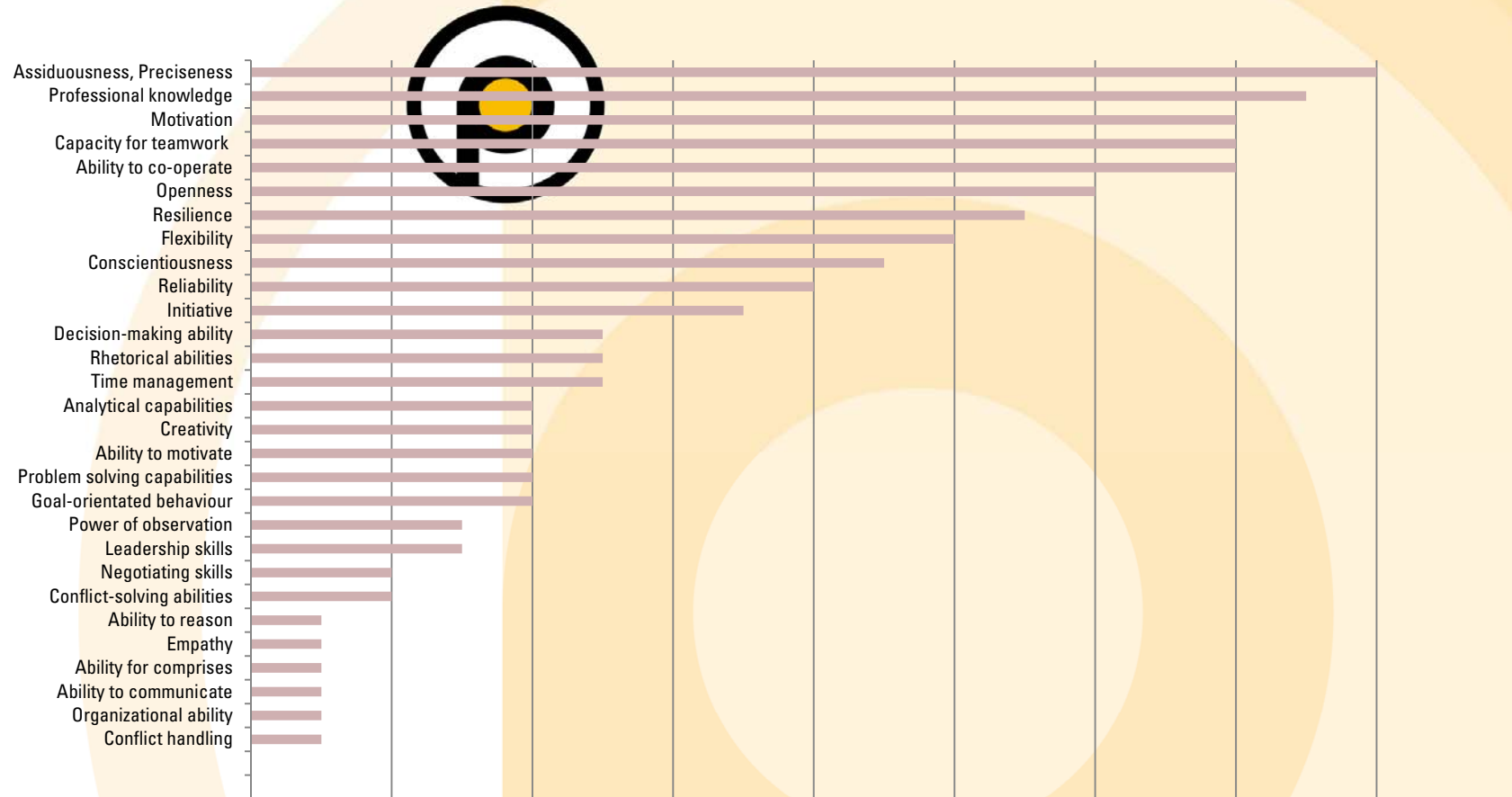
- Identification of professional standard situations

- Scopes: client counselling, order handling, construction, handling means of work and products, planning repair work
- Tasks: information providing, product calculations, troubleshooting, organization of internal processes, materials procurement, taking over new functions, complaint handling



Professional acts demand social-communicative, personal and professional-methodical competences.

The Learn2actProject – demands on professional acting



•Figure 2: Ranking of sub-competences required for professional acting

The Learn2actProject – Competences strengthened by the concept of activity-orientation

| | | | |
|---|--|--------------------------------------|--|
| P Patience Self responsibility Capacity to accept criticism | P/A Autonomy P/A Openness to change P/A Readiness for action A/P Resilience | | A Initiative Solution orientation Flexibility Art of improvisation |
| P/S Ability for compromises S/P Empathy S/P Customer orientation S/P Capacity for teamwork | P/F Assiduousness P/F Eagerness to learn | A/S Ability to get in contact easily | F/A Organizational ability F/A Ability to reason |
| S Co-operation Communication | F/S Ability to present S/F Capability of objective argumentation | | FM Handling means of work and tools Diagnostic capabilities Professional knowledge Planning behaviour |

Atlas of competences "Learn2act"

P = Personal competences

A = Activity-orientated competences

S = Social competences

FM = Professional and methodical competences

The Learn2act project – competences strengthened by the concept of activity-orientation

Tools

Questionnaire => Competence
Finger Print

Set of methods and social
forms

Taking measures/Evaluation
(forms)

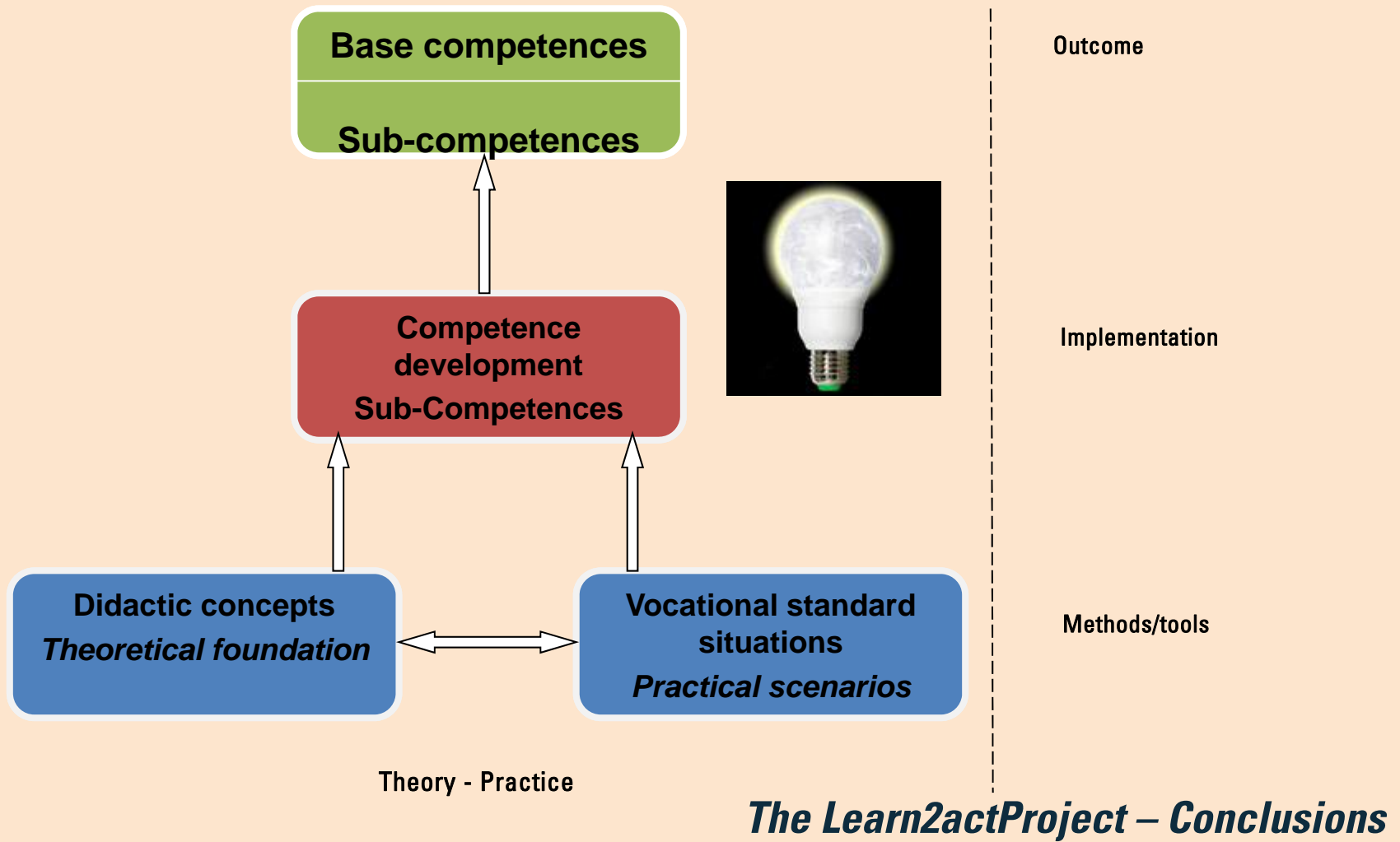
Goals

Self-check
Identification with vocational
standard situations

Reflection

Developing
sub-competences
critics

The Learn2actProject – Development of specific competences by didactical intervention



Human sciences

Didactics and
specific didactics

AR questions:

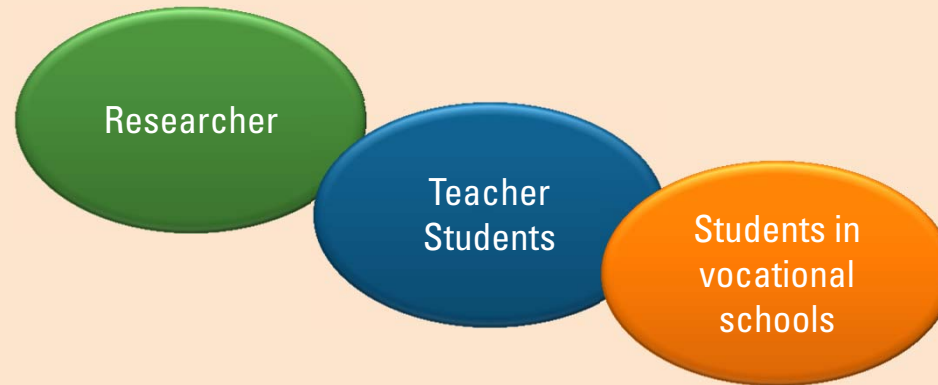
**Which teaching methods
influence students' competences?**

**How can teaching methods be
adapted to specific situations?**

Supervised
teaching practice

The Learn&act project - Action Research

Roles



Steps

Step 3:

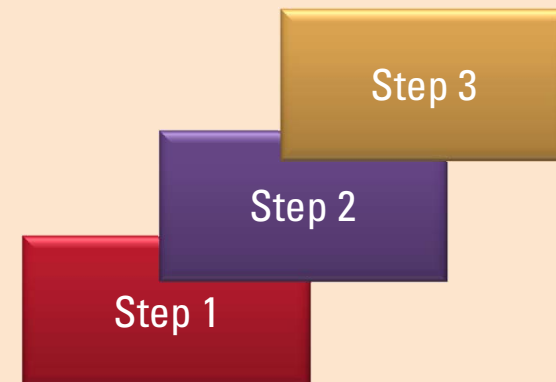
Issuing the results

Step 2:

Planning, implementing and evaluating actions

Step 1:

Ignition – Collecting and interpreting information



- Not every teaching method matches with the teaching issue.
- Newly deployed teaching methods are laborious.
- In subjects like mathematics, science (*Fachkunde*) and methodical competences are critical.
- Group work and individual work ... to explain basics of Physics ... experiments to visualise are necessary
- For complex contents I use the 4-step method.
- For the subject-combination of mathematics and technical drawing, complete projects are performed ...

***Individual theoretical approach (teacher students)
concerning teaching methods***



Step 1: Ignition

Step 2:
Planning,
implementing and
evaluating

Step 3:
Issuing the results

Erhebungsblatt

| | | | | | | | | | |
|---|---|---|---|--------|------|-----|--|-------------|---|
| Allgemeine Daten | Schule: | LBS Graz 4 | Schüleranzahl: | M | W | | | | |
| | Klasse: | 4h-GWH | | 17 | 0 | | | | |
| | Lehrberuf: | Installateur | Klassenlehrer anwesend | Ja | Nein | | | | |
| | Unterrichtsfächer: | CFZ, AMA, HET, LAÜ | | x | | | | | |
| | Datum: | 21 UE, ca. 1,5 Wochen | Zeitpunkt Schuljahr/LG | Anfang | 2/4 | 3/4 | ende | | |
| | Uhrzeit: | | | | | | | | |
| | Stunde: | 21 Einheiten | | | | | | | |
| | Sonstiges: | fächerübergreifend | | | | | | | |
| Während der Projektphase | Evaluation Schüler/innen | | Noten (Schulnotensystem) | | | | | Anmerkungen | |
| | | | 1 | 2 | 3 | 4 | 5 | | |
| | Einstellung zum Unterricht – am Beginn der Stunde | | | x | | | | | teilweise Unterschiede aufgrund der Verschiedenheit der Schüler |
| | Arbeitseifer | | x | | | | | | Leistungsniveau sehr unterschiedlich |
| | Konzentration | | | | | | | | durchwegs zufriedenstellend, zeitabhängig |
| Einstellung zum Unterricht – am Ende der Stunde | | | x | | | | in Ordnung, zweitweise verbesserungswürdig | | |
| Während der Projektphase | Evaluation Lehrer/innen | | Anmerkungen | | | | | | |
| | Wahl der Methode: | | fächerübergreifender Projektunterricht | | | | | | |
| | Medieneinsatz: | | Tafel – Tafelbilder, Overhead mit Folien, PC inkl. Beamer und Zubehör (Drucker, PC-Arbeitsplätze für die Schüler) | | | | | | |
| | Auswahl der Lernziele: | | fächerübergreifende Lernziele zur Lösung einer komplexen Aufgabe (Projektaufgabe) mit EDV-Bezug (EDV-gestützter Unterricht) | | | | | | |
| Lehrer/innen-Schüler/innenkommunikation | | während der Erarbeitungsphasen offenes Lehrer/innen-Schüler/innengespräch, während der Gruppenarbeitsphase (Projektphase) interne Kommunikation bzw. bei Problemen Kontaktaufnahme mit dem Lehrer/der Lehrerin. | | | | | | | |

Master data

Qualitative comments

Students' evaluation

Marks

Teaching methods evaluation

Demanded Sub-competences

- Communication (customers, firm, boss, colleagues) S
- Professional knowledge (hydraulic, construction-guidelines) F
- Preciseness (problem-finding, control of heating apparatus) S/P
- Orientation on the construction site A
- Order (controlled working) F
- Quickness (the rooms should get warm as soon as possible) S/F
- Economic efficiency (efficient and cost-saving solution) F/A
- Reading competences (inventory and cable-lines) S/F
- Creativity P/A
- Flexibility A/P
- Security F/S
- Punctuality S/F

Examples: collection of specific vocational sub-competences

Step 1: Ignition

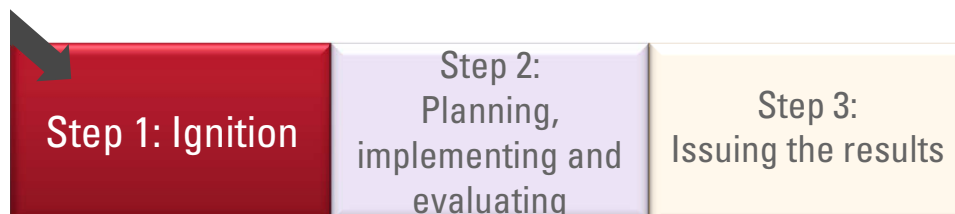
Step 2:
Planning,
implementing and
evaluating

Step 3:
Issuing the results

**Questionnaire:
Competence finger print**

| Frage Nr. | Fragestellung | Aussage trifft genau zu (1) | Aussage trifft zu (2) | Aussage trifft nicht zu (3) | Probanden gesamt |
|-----------|---|-----------------------------|-----------------------|-----------------------------|------------------|
| 01 | ... habe ich in meiner Gruppe | 13 | 3 | 1 | 17 |
| 02 | ... haben mir die anderen geholfen, wenn ich darum gebeten habe. | 5 | 9 | 3 | 17 |
| 03 | ... haben alle in etwa gleichviel gearbeitet. | 12 | 4 | 1 | 17 |
| 04 | ... wurde intensiv gearbeitet. | 4 | 10 | 3 | 17 |
| 05 | ... bin ich mit den Arbeitsergebnissen der Gruppe zufrieden. | 10 | 7 | 0 | 17 |
| 06 | ... war mir ständig klar, was ich zu tun habe. | 14 | 2 | 1 | 17 |
| 07 | ... habe ich nichts dazugelernt. | 11 | 6 | 0 | 17 |
| 08 | ... konnte ich meine Gedanken und Meinungen voll einbringen. | 2 | 5 | 10 | 17 |
| 09 | ... habe ich zusätzliche Informationen selbstständig eingeholt bzw. berücksichtigt. | 8 | 9 | 0 | 17 |
| 10 | | 10 | 6 | 1 | 17 |

Example: project-orientated teaching method





AR questions:

Which teaching methods influence students' competences?

How can teaching methods be adapted to specific situations?

AR answers:

Teacher students recognize that developing specific competences in their students requires specific teaching methods.

Teacher students recognize that there is a demand for adapting teaching methods with regard to specific teaching situations.

Step 1: Ignition

Step 2:
Planning,
implementing and
evaluating

Step 3:
Issuing the results



- Bachelor theses
- Analysis of special teaching methods in context of competence-orientated subject (eg. retail, wholesale)
- Wiki in future

Step 1: Ignition

Step 2:
Planning,
implementing and
evaluating

Step 3:
Issuing the results



Questions?

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Thank you for your attention!