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Work-Based Learning in VET – How to Link Practice and Theory?

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Climb – From Learning to Success
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Overview

- **Research of Workplace Learning**
- **Workplaces Supporting Learning**
- **The Workplace – One of the VET Learning Contexts**
- **Quality VET as Integration of Learning from Different Contexts**
- **Some Examples of Related Research at SFIVET**

Research on Workplace Learning

- **Expansion since the 1990s**
- **Broad, interdisciplinary topic, different levels and aspects examined**
- **Workplace learning in general**

  vs.
- **Work-based learning related to apprenticeship or trainee programmes**

Nature of Formal and Informal Learning

Formal (School) Learning	Informal (Workplace) Learning
Planned (and unplanned)	Unplanned (and planned)
Symbol manipulation, decontextualised	Contextualised reasoning
Focused on mental activities	Focused on tool use and mental activites
Explicit knowledge, generalised skills	Implicit, tacit knowledge, situation-specific competences
Individual	Collaborative

Different Metaphors of Learning

Learning as

- **Knowledge and skill acquisition**
  (acquisition metaphor, Sfard 1998)
- **Participation in communities of practice**
  (participation metaphor, Sfard 1998)
- **Knowledge creation** (Paavola et al., 2004).

How People Learn at Work

Learning is stimulated by

- **doing the job**
- **collaborating and interacting with colleagues**
- **working with clients**
- **working on challenging, new tasks**
- **reflecting and evaluating work experiences**
- **elements of formal education**
- **extra-work contexts**

(e.g. Billett, Smith & Barker, 2005; Collin, 2002; Collin & Valleala, 2005; Eraut, 2004)

Quality Workplaces (for Learning)

Fuller & Unwin (2004)

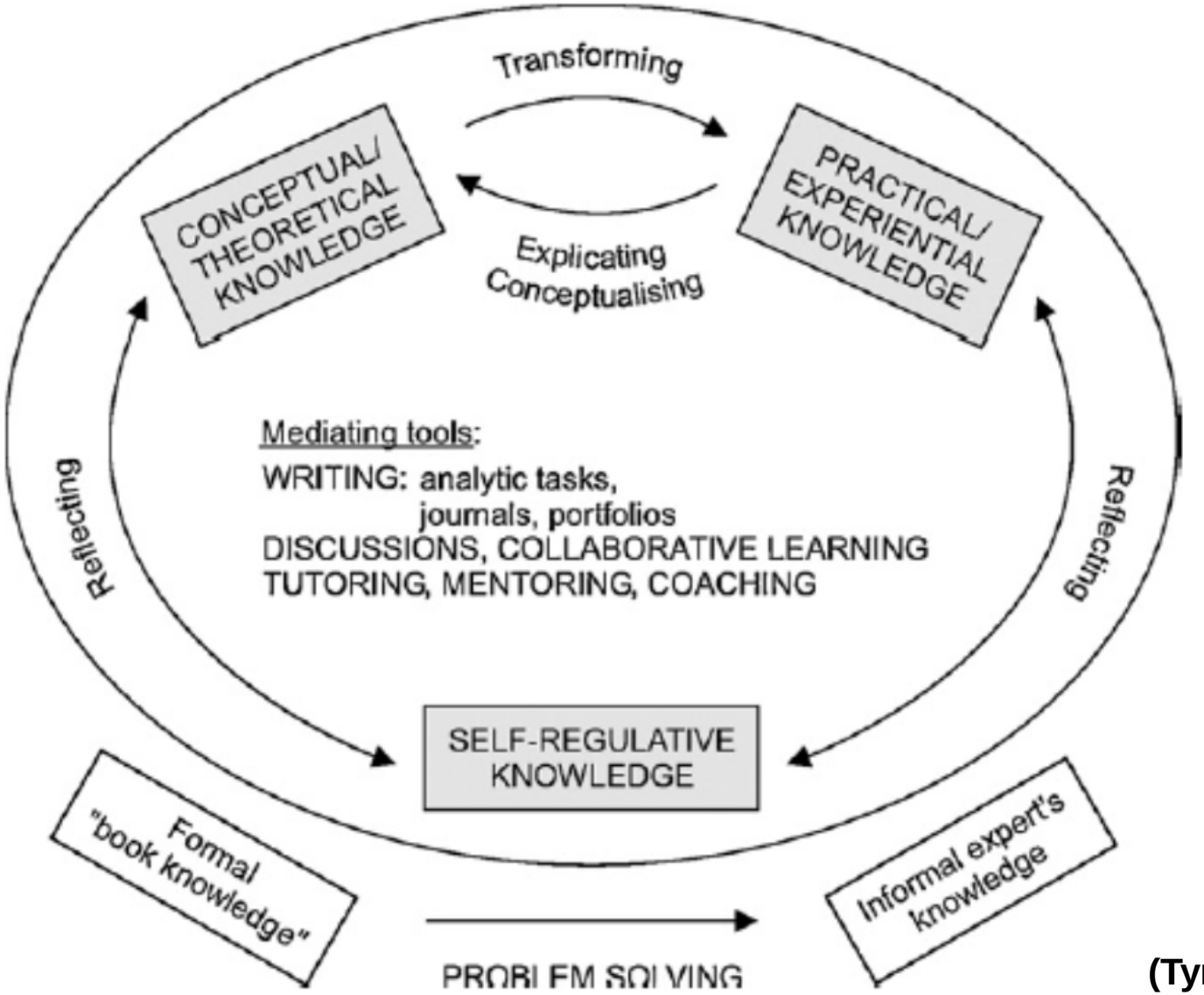
- **Opportunity to engage in diverse communities of practice in and outside the workplace**
- **Job organisation providing employees with opportunities for co-constructing their knowledge and expertise**
- **Opportunity to build up knowledge off-the-job** (theoretical, knowledge-based qualification)

→ **Expansive vs. restrictive work communities**

Workplaces as Learning Environments: Five Models
(Guile & Griffiths, 2001)

- **Traditional**
- **Experiential**
- **Generic**
- **Work-process based**
- **Connective**

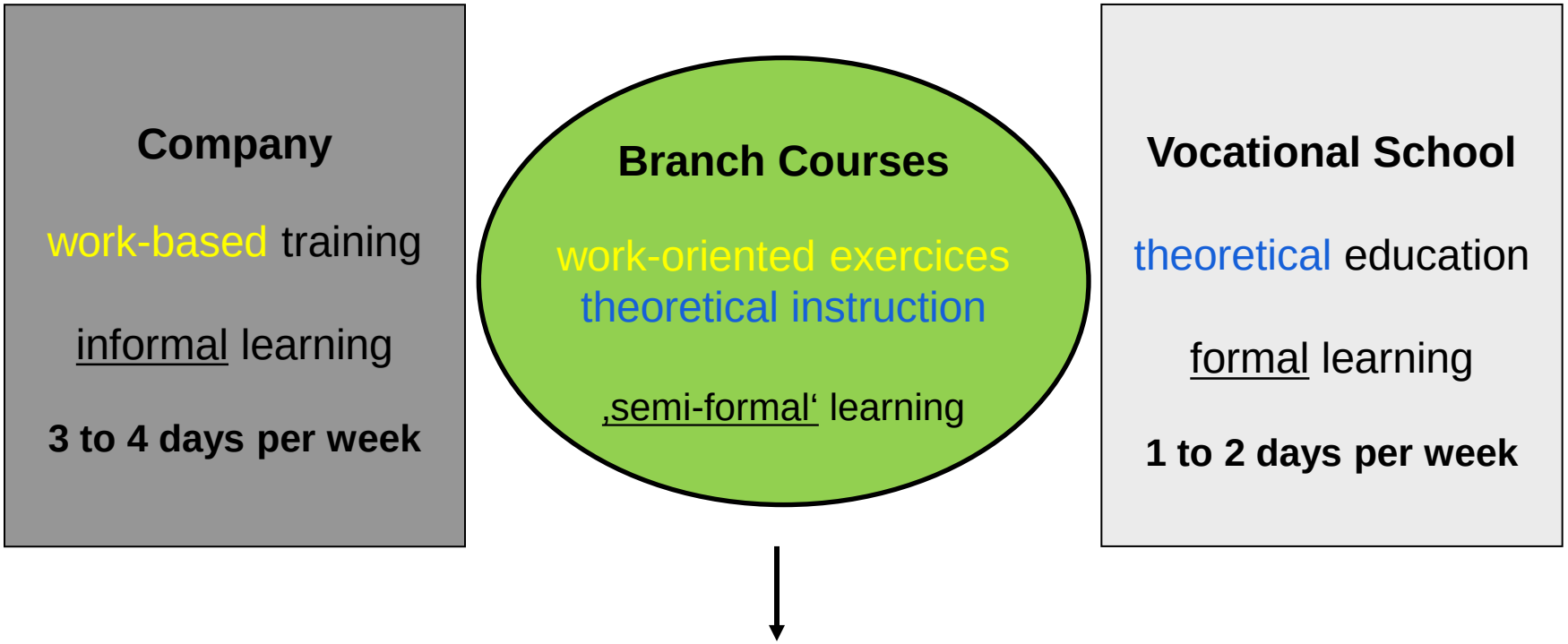
Integrative Components of the Development of Vocational and Professional Expertise



(Tynjälä et al., 2006)

Learning Contexts in (Swiss) VET – Company, Vocational School, Branch Courses

→ Project to Foster Teaching and Learning in Branch Courses



Goals: Competent use of machines and tools

- → **teach related knowledge and skills**
- → **foster methodological, personal, and social competencies**

Training/Teaching in Branch Courses
(Field Observations in Courses for Car Assistants)

The trainers

- **provide theoretical instruction** to prepare exercices at workstations (whole-class)
  → ***documents, ppt, explanations***

- **coach practical exercices** (with related paper-and-pencil questions)
  → ***demonstrate*** *and* ***explain*** *tasks (whole-class, no thinking-aloud)*
  → ***provide written assignments*** *and* ***technical documents*** *(in the workstations)*
  → ***supervise*** *and* ***support trainees*** *(mostly individually) by* ***checking, asking questions, explaining*** *and* ***demonstrating*** *(no thinking-aloud)*

→ **60-80 % of time spent in workstations, mostly individually**
→ self-regulation of the trainees is an issue!

→ **teacher- and product-centered instruction, unequally distributed individual support, learning/problem solving strategies are rarely discussed**

Learning in Branch Courses (Field Observations)

- **Solve practical exercices** (doing)
- **Build up occupation-specific skills, knowledge, attitudes** (by instruction and doing)

Trainees

→ **are passive, do not activate prior knowledge, lose concentration during instructional phases**

→ **have difficulties to understand written assignments and documents**

→ **do not suffficiently plan, monitor and control their work**

→ **do not reflect on their work**

→ **are often „off-task“, waiting for help**

Forms of Support to Develop

- **Optimize tasks**
  - → Include **self-observation** prompts and **strategic information** in assignments and materials for the trainees

- **Make strategy use explicit**
  - → **Model**: demonstrate and explain strategy use (thinking aloud)
  - → **Coach**: stimulate strategy use with graduated hints (scaffolding/ fading)
  - → **Articulate**: stimulate trainees to describe their strategies
  - → **Reflect**: stimulate trainees to compare and evaluate their strategies
  - → **Explore**: stimulate independent stratey use and transfer

- **Optimize feedback**
  - → secure successful performance
  - → set up a positive feedback culture

Development of Training Components

- **Collaboration with four trainers**
- **Identify task-related strategies**
- **Describe strategies and provide texts on cognitive education** (research team)
- **Discuss texts with the trainers**

Design training components that are

- relevant

- shared

- «informed» → peda-gogical knowledge

Training components

1. **Discussion and reflection of strategies in groups → “learning stops”**
2. **Individual description and reflection of strategies → enrich technical task assignments with questions to stimulate self-observation of the learning process (learning journal with prompts)**
3. **Enrichment of course documents → evoke workplace situations, integrate process-related reflective questions and comments.**

Goals of Learning Stops

- **Trainees discuss and reflect their practical experiences** (exercices)
- **Focus on Problem Solving (Learning) Strategies**
- **Activate the trainees' prior knowledge** (introductory activities or questions)
- **Prompt strategies with deepening questions**
- **Analysis of risks and mistakes**
- **Transfer probes**

- **Learning stops don't last too long (2 to 3 times a day, for 10 to 30 min)**
- **Trainers facilitate and support (moderate, not instruct!)**

Analysis of Discourse Patterns

Who is speaking? Are strategies made explicit? Who makes them explicit?

Dimension trainer:	
open questions	closed, guiding questions
short statements	long statements (explanations)

Dimension trainees:	
long statements (full sentences)	short statements (keywords)
theme-related statements	“off-task” statements
elaborative / critical-reflective statements	keywords

Progression of discourse:	
trainees have a large share of discourse	trainer has a large share of discourse
turntakes are „fluent “.	turntakes are „viscous“, long pauses without answer

Task difficulty:	
trainees can solve the task on their own	trainees need support to solve the task

Focus of discourse:	
focused on strategies , risks, errors	focused on repetition of knowledge (facts, concepts)

Retrospective Statements of Trainers on Learning Stops

(examples from interviews)

«I feel it has a very positive effect on trainees because they finally hear the key points also from colleagues. Perhaps, they also hear different strategies how to get to the goal. And for myself, it has been a relief because fewer questions were asked afterwards. So, it gives me space to help where they have really problems and I do not have to answer to less important issues.» (Trainer 1)

«It may turn out that he is looking for something in the textbook, but has no strategy. In this case, not the technical matter is concerned but it's about how to treat the textbook ... I may prepare something and assume that's the problem but it is elsewhere. One needs to feel where the problem is ... in learning stops this is possible.» (Trainer 2)

«Better relationship with trainees. They feel more involved in what they do because they have a say, it gives them the place they deserve, they feel important.» (Trainer 3)

Project «Everyday Mathematics at Work»

(Kaiser 2011, 2015)

Problem:

Maths ‘generate’ a lot of extra tuition courses in VET schools

Questions:

- **Which numeracy at which workplace?**
- **What do learners know when they start VET?**
- **Which maths didactics in VET courses?**

Percentages in Context (Healthy Food)

Package of muesli: 500g flakes

Sugar content: 39%

Is that a lot?

Situated conception

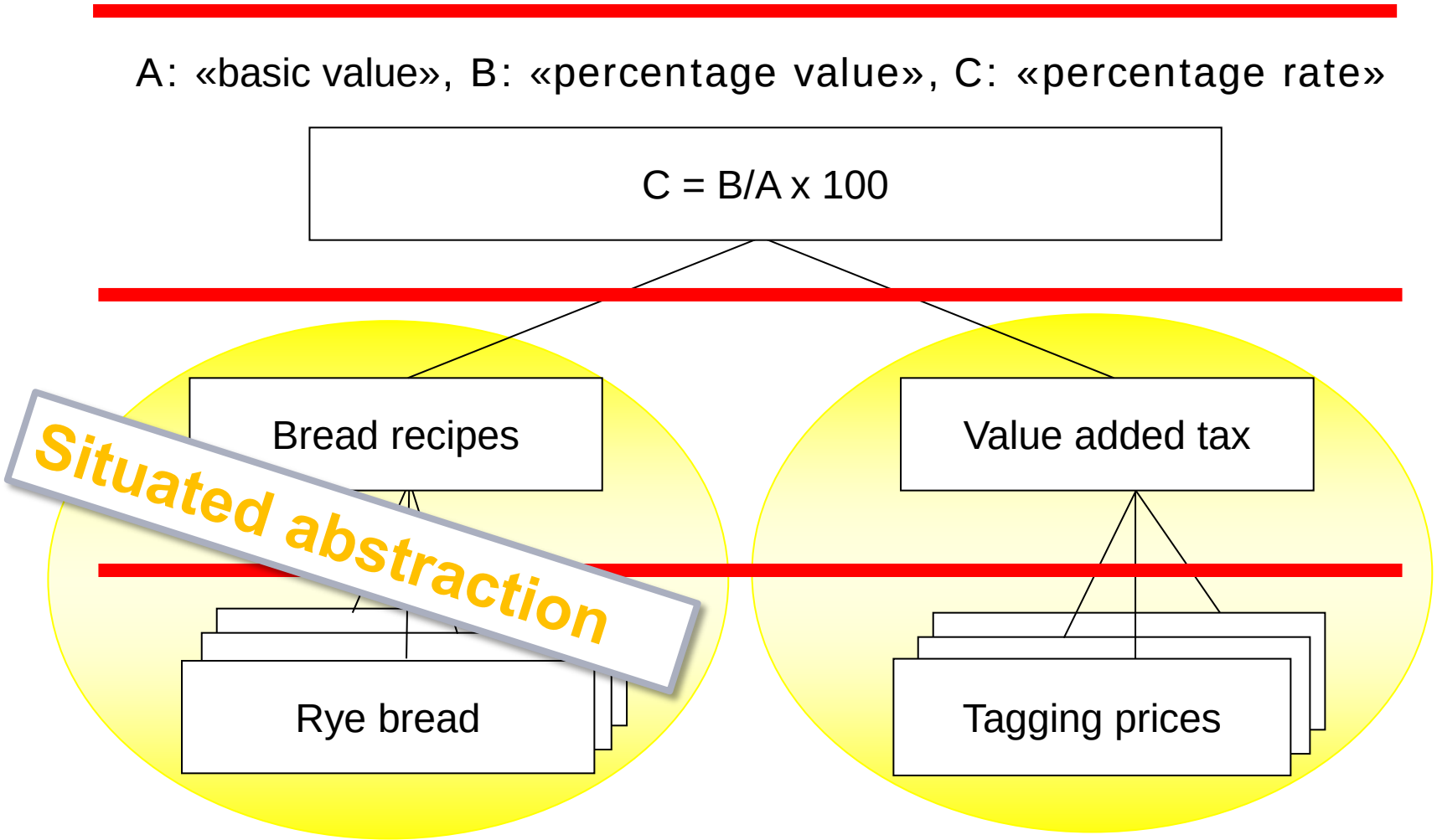
- **100% is the whole**
- **39% denotes a part of this whole**

Percentages in Context (Baker)

Bread Recipe

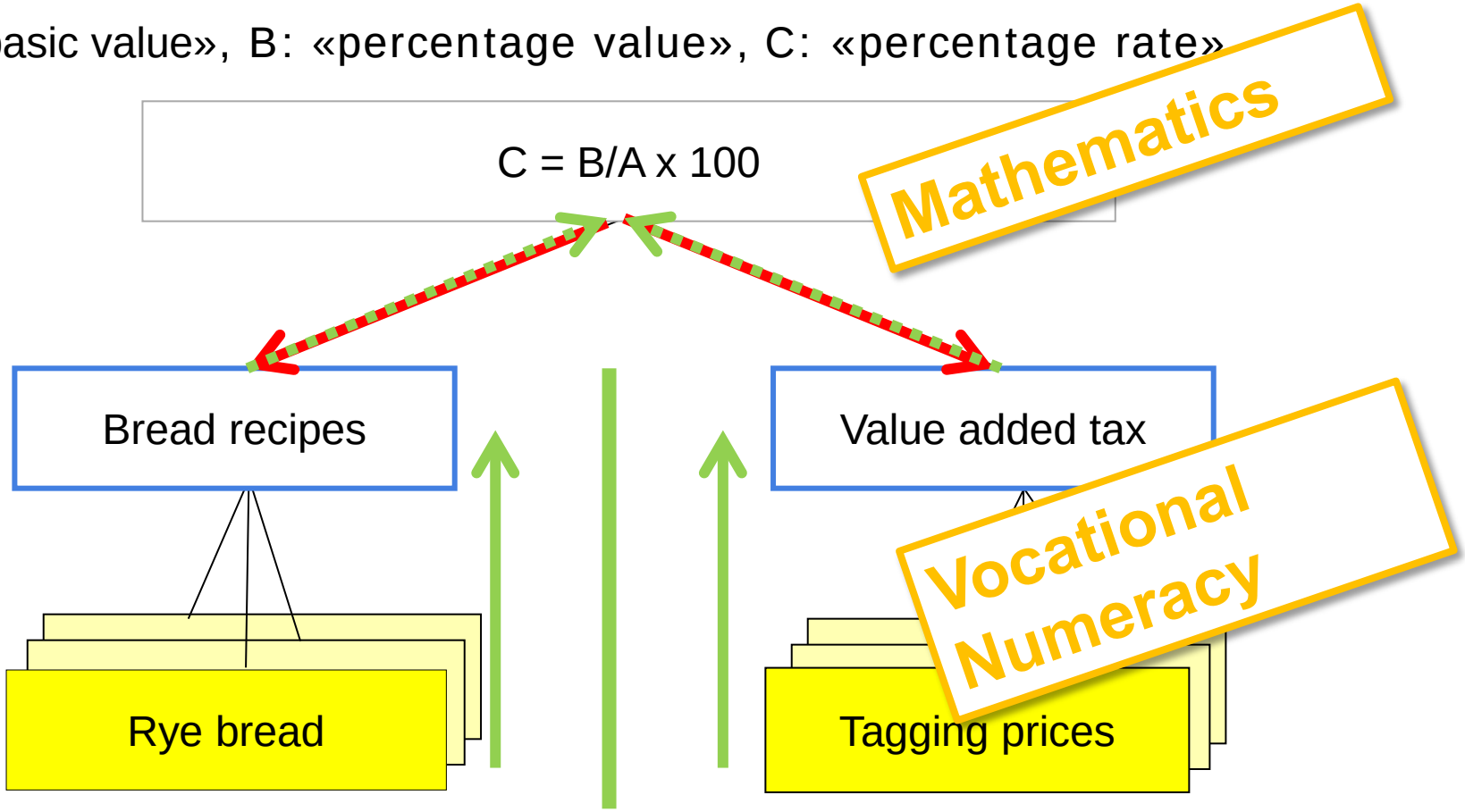
Wheat flour	**80%**
Bruised grain	**20%**
Water	**75%**
Yeast	**4%**
Salt	**2%**

Situations of Vocational Action



Stay on the Ground, Abstraction as a Bonus

A: «basic value», B: «percentage value», C: «percentage rate»



Using Situations for Teaching at VET School: Eight Steps

1. **Wait until learners have made experiences!**
2. **Talk about experiences**
3. **Elaborate solutions in groups**
4. **Critically discuss group solutions**
5. **Model professional procedure**
6. **Practice with own invented tasks**
7. **Write cheat slip**
8. **Discuss use in the company**

Working with Situations «Eight steps» (3,4)

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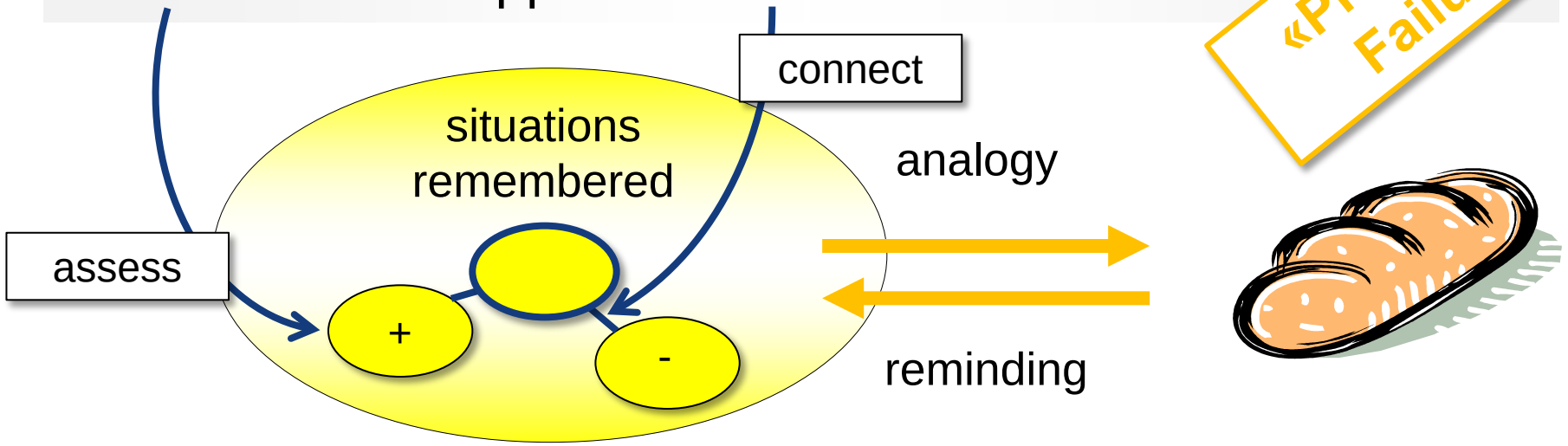
3. Set a task at an intermediary level and let the learners work in groups to identify solution approaches based on their available knowledge.
4. Critically discuss the groups' solutions. Value useful approaches.



Working with situations «Eight steps» (7,8)

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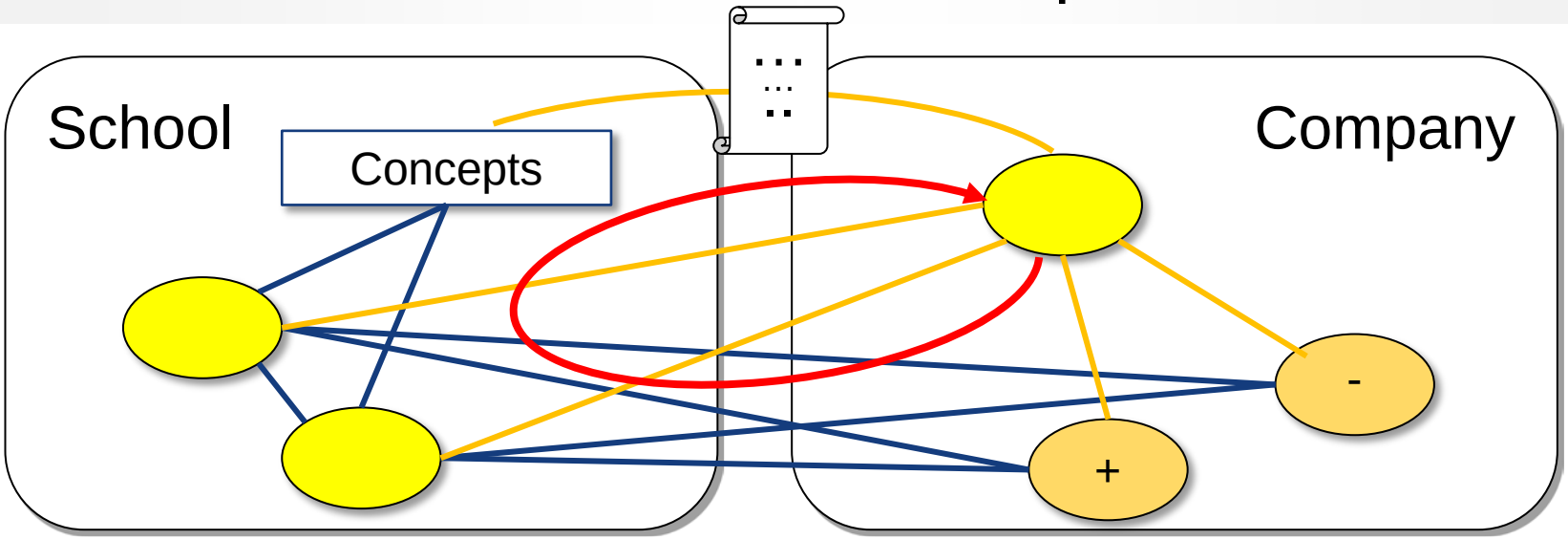
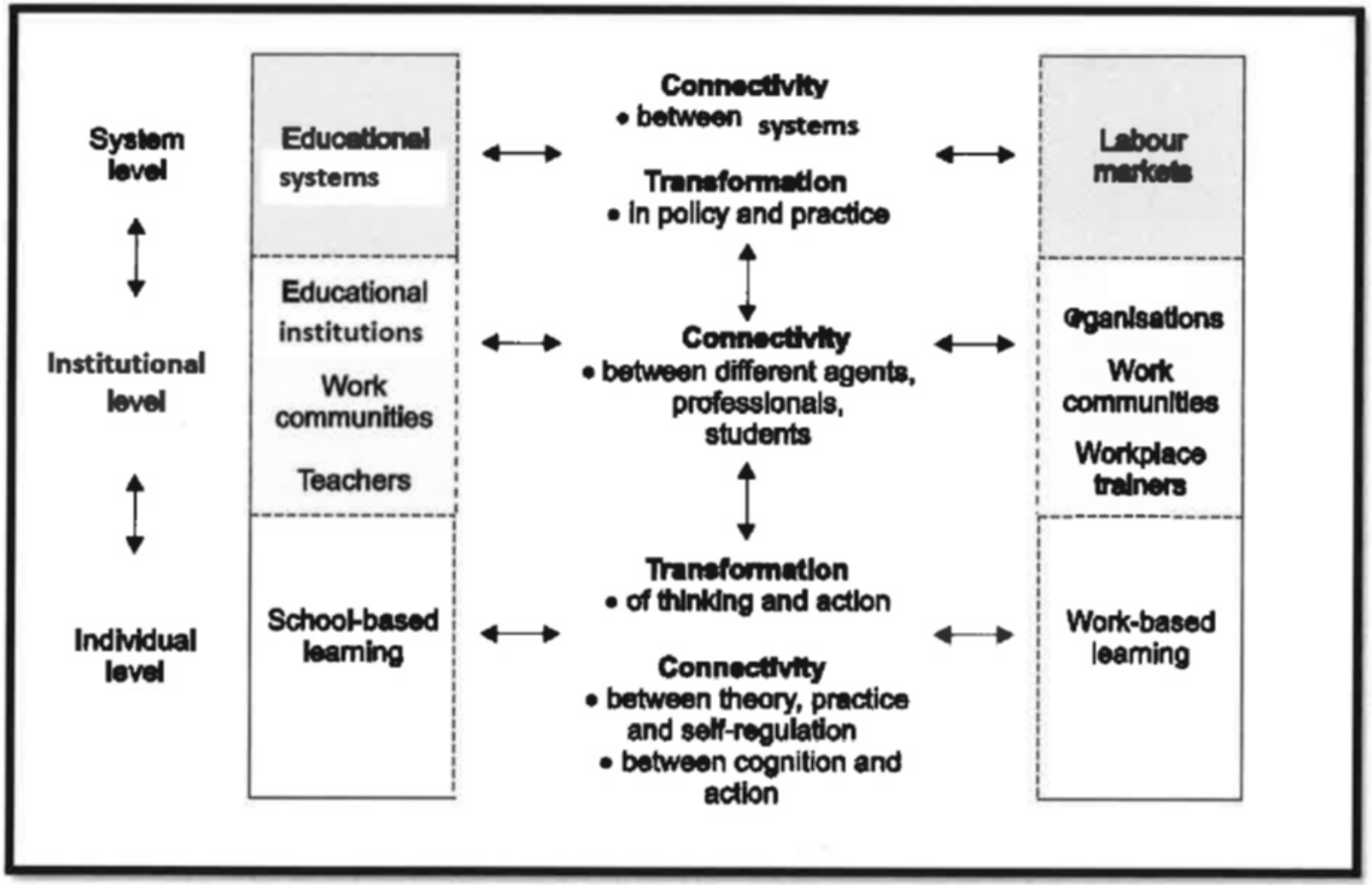
7. Compile key data, elaborate a cheat slip for the company.
8. Discuss applications in the company, let learners collect their own examples.



ConVET Project: Connectivity model

(adapted from Stenström, Tynjälä, 2009)



http://www.projectconvet.eu

Connective Teaching and Training Practices

(some recommendations from the ConVET project)

- **Competence-based models** favour teaching and learning. Teachers and trainers must be aware of the need to integrate work-based learning and theoretical learning at school.
- School teaching should **build on authentic work situations** (learners' real work experience). Learners need **opportunites to reflect on their work experience** in addition to learning from practical exercises or simulation.
- Learning in VET should be seen as the **product of cooperation and shared responsability** among the actors in school and at the workplace.
- **Contextualisation of knowledge** at school and **conceptualisation of situation-embedded actions** at work are main processes to support learning.
- **"Why" questions** promote learning: Learners should know what and how but also why they do.
- Learning across different learning sites implies processes of transfer of knowledge and skills as well as processes of transitions across identities, norms and values. **Transfer and transition should be supported** by teaching and training practices.
- **Boundary objects** between school and workplace could be crucial tools of teaching and learning. ICT tools can contribute to support connectivity.

Thank you very much for your attention!

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