Teaching for improved learning in vocational education
presenters
Integration of academic and vocational disciplines Reasons for action in practice
Martijn van Schaik
University of Applied Sciences Amsterdam, School of Education.

How teachers in vocational education interpret their teacher-student interactions in
terms of educational values and ideals
Carlos van Kan, Ilya Zitter, Barbara van Wijk & Patricia Brouwer, Centre for Expertise in
Vocational Education and Training (ecbo), Utrecht.

How teachers learn to scaffold and how scaffolding affects students’ achievement and
engagement: An experimental classroom study
Janneke van de Pol, Monique Volman, Frans Oort, Jos Beishuizen
Utrecht University (UU), University of Amsterdam (UvA), VU University Amsterdam (VU)

Teachers’ practice in preparatory secondary vocational education: A mixture of teacher
control, and stimulating self-regulation.
Jantine van Beek, Alexander Minnearts, Theo Wubbels & Frank de Jong
Stoas Wageningen Vilentum University of Applied Sciences, Groningen
University, Utrecht University,
Integration of academic & vocational disciplines
Integration of academic and vocational disciplines

Reasons for action in practice

VOR L&I
[Netherlands Educational Research Association]
DIV Learning & Instruction

AERA 2013
Overview

• Final intervention at 4 schools in DRB project
• Video method
• Web of reasons and knowledge
• Reasons for action in practice: levels of integration
• Video episodes
• Discussion
The DBR

Design based research in 3 phases:

• Case study (06/07)

• Intervention I at 2 schools (07/08)

• Intervention II at 4 schools (08/09)
The case

• Intervention II:
  Design and construct a tandem tricycle
  Guided co-construction
  Preparatory secondary vocational education (PVSE)
The case

Method:

DBR: assignment for students, tools for teachers to implement

qualitative: interviews, observations (all video)

quantitative (phase 2/3):

pre- and posttests
The case

Earlier studies:

Designing by students leads to better understanding

Teachers should simulate ‘real’ design process

Models/drawings as tools between theory and practice
The case

Van eigen ontwerp tot echt product in het vmbo
Web of reasons

“the complex of interconnected reasons, premises and implications, causes and effects, motives for action and activity, and utility of tools for particular purposes that are at stake in particular situations”

(Bakker & Akkerman, submitted)
Integration of academic & vocational disciplines

Levels of integration

Table 1
Levels of knowledge integration used as codes in the data analysis (derived from Bakker & Akkerman, submitted)

<table>
<thead>
<tr>
<th>Level</th>
<th>Characterization</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Statement about something scientific-mathematical/vocational or work-related but without explanation or reasoning</td>
</tr>
<tr>
<td>2</td>
<td>Reasoning or explanation with only scientific-mathematical/vocational or only work-related (non-theoretical) knowledge.</td>
</tr>
<tr>
<td>3</td>
<td>Statement in which a scientific-mathematical/vocational fact and a work-related fact are combined.</td>
</tr>
<tr>
<td>4</td>
<td>Reasoning with both scientific-mathematical/vocational and work-related knowledge</td>
</tr>
</tbody>
</table>

Results

At every school we observed four lessons, all practice lessons. At school 1 we also observed a prototype lesson. At school 2 there were no separate prototype lessons; the subject-matter teachers at that school were present during the regular practice periods and the content of the prototype lessons was taught in the context of those practice lessons. All together we gathered almost 12 hours of video data (see table 2).
### The video

<table>
<thead>
<tr>
<th>Case study</th>
<th>Video (hrs)</th>
<th>Schools</th>
<th>Students</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>30</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>First experiment</td>
<td>40</td>
<td>2</td>
<td>65</td>
</tr>
<tr>
<td>Final experiment</td>
<td>30</td>
<td>4</td>
<td>87</td>
</tr>
</tbody>
</table>

| 11 | 2 |
Integration of academic & vocational disciplines

Models in action
Reasons for action

Table 3
Level of integration in utterances

<table>
<thead>
<tr>
<th>Levels of integration</th>
<th>School 1</th>
<th>School 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>week 4</td>
<td>week 6</td>
</tr>
<tr>
<td>Level 1</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Level 2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Level 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level 4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Later

Interview

Lesson type
duration of video obs.
number of repr.

Practice (drawing)
Practice
Practice
P-lesson
Practice
Practice
Presentation

Total

Table 2
Video data and number of representations

When we look at the number of presentations (drawings and models) during the observations we can see that school 1 had six more in total. However at school 2 representations were still present at the end of the process, whereas at school 1 as the process evolved the representations disappeared. This is in line with our previous findings (Van Schaik et al., in press).

18 episodes were selected in which the students we followed for this study were present. Most of those were around the episodes in which representations were visible. In two episodes there were no representations.

In all episodes and in an interview we code the utterances to the level of integration (table 3). As with the representations, at school 1 the prevalence of utterances with some level of knowledge decreased towards the end of the process. At school 2 however, in the final presentations students still showed integration of knowledge. Another difference between the schools is the level of integration. At school 1 only level 1 and level 2 utterances were found, whereas at school 2 also level 3 integration was coded. No level 4 was found in the observations.
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Reasons for action

Typical statements and reasoning

To attach the chair, this one also has to be like this.
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Reasons for action

Teacher guidance
Discussion

- Models and reasons fade after practical part of process starts:
  - how to maintain theoretical (level 3/4) reasoning?
- What should be simulated:
  - academic practice
  - vocational practice?