

Education in the Netherlands

Evert de Kock

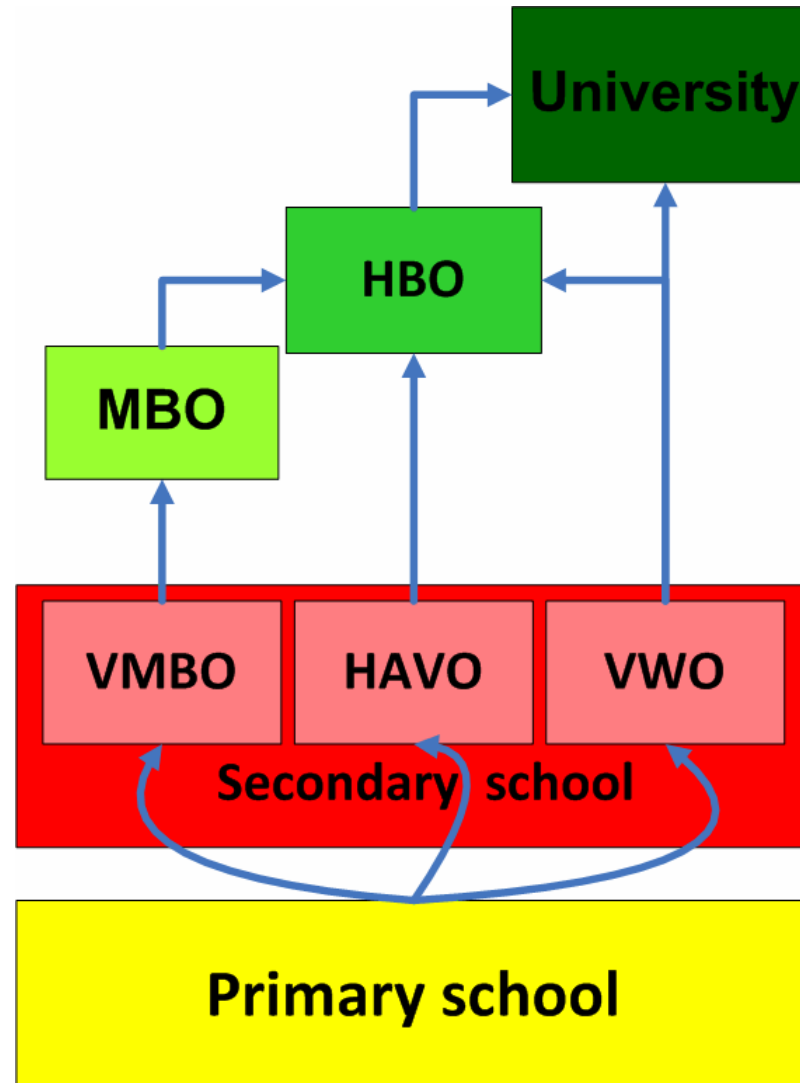
TU / **e** Technische Universiteit
Eindhoven
University of Technology

Where innovation starts

Content

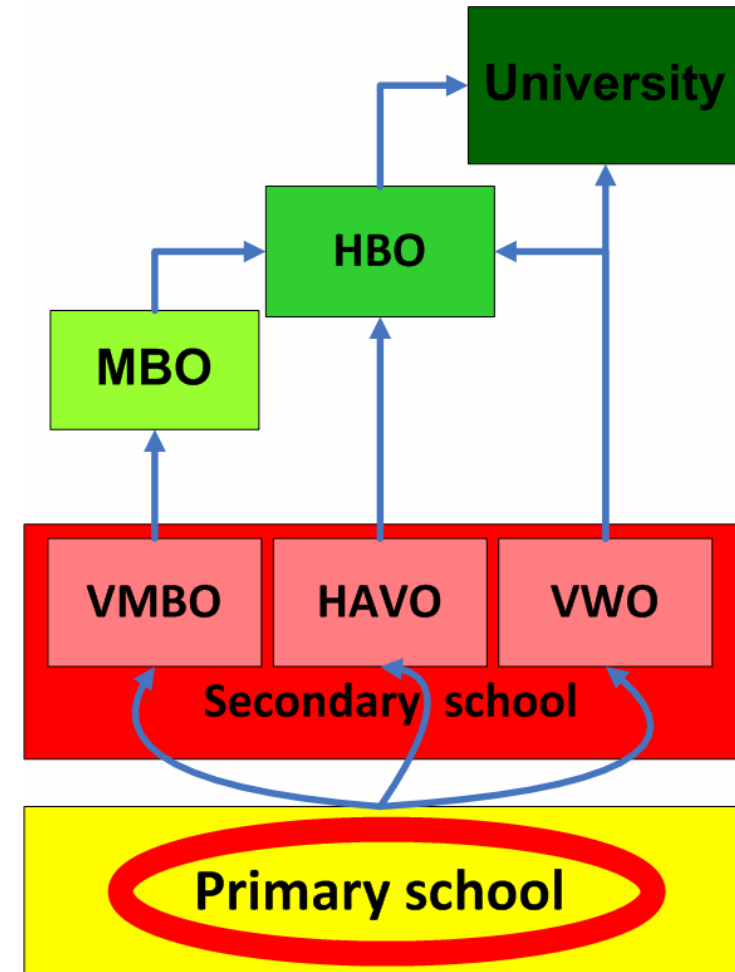
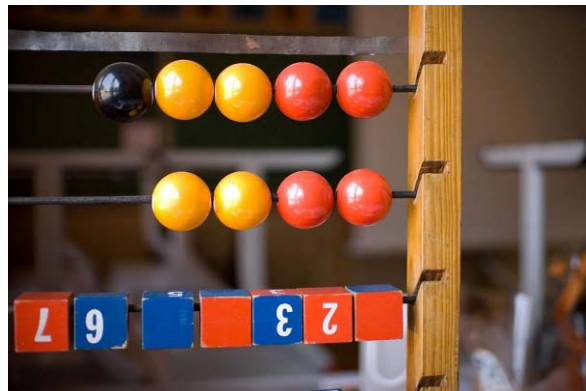
- **Education structure**
 - Primary school
 - Secondary school (VMBO, HAVO, VWO)
 - MBO, HBO and University
- **Mechanical engineering in Eindhoven**
 - Bachelor structure
 - DBL (**D**esign **B**ased **L**earning)
 - Tutor
 - Working methodology
 - Through the years
 - Some examples

Education structure



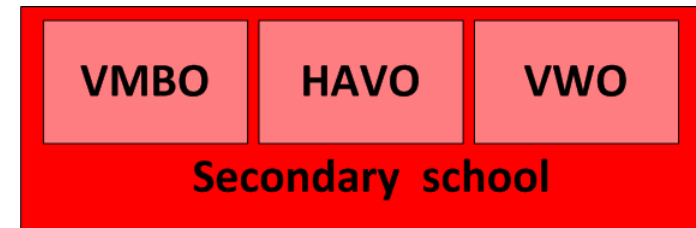
Primary school

- Children 4 – 12 years old
- Groups 1 – 8
- No distinguishing between pupils
- Standard courses:
 - Dutch and English
 - Math and nature
 - Drawing and craftwork
 - History and geography
 - PE and music
- No lunch at school



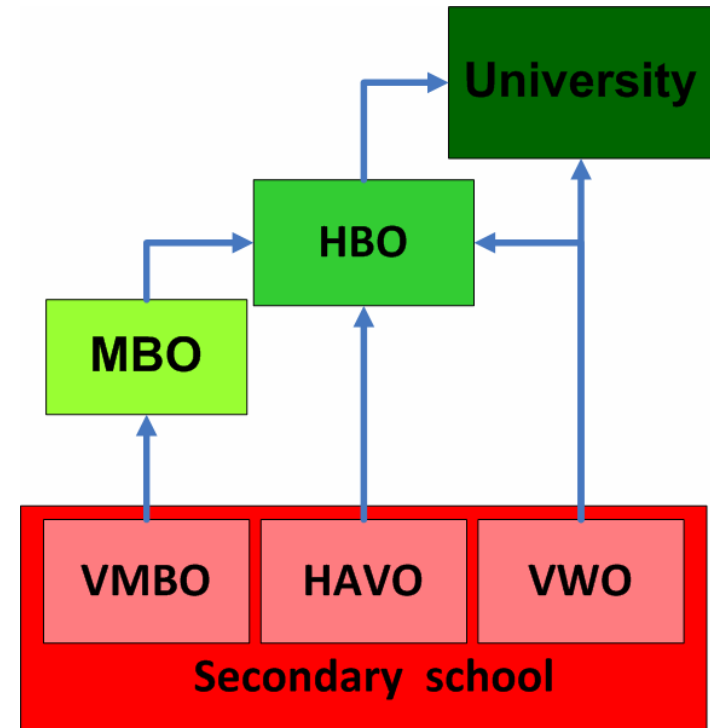
Secondary school

- Distinguishing between students (CITO)
- Three separated levels:
 - VWO (6 years)
 - HAVO (5 years)
 - VMBO (4 years)
- VWO (pre-university education):
 - First 3 years general courses
 - Last 3 years choice of profile
 - Culture and society
 - Economy and society
 - Nature and health
 - Nature and technology
 - Profile determines choice university education



MBO, HBO and University

- VMBO → MBO (4 years):
 - MBO is more focused on getting work experience
 - Preparing you for the labor market
- HAVO → HBO (3 or 4 years):
 - HBO less focused on work experience and more on theoretical subjects
 - Finished: bachelor degree (NOT a university bachelor)
- VWO → University (or HBO):
 - 3 years bachelor
 - 1 or 2 years master

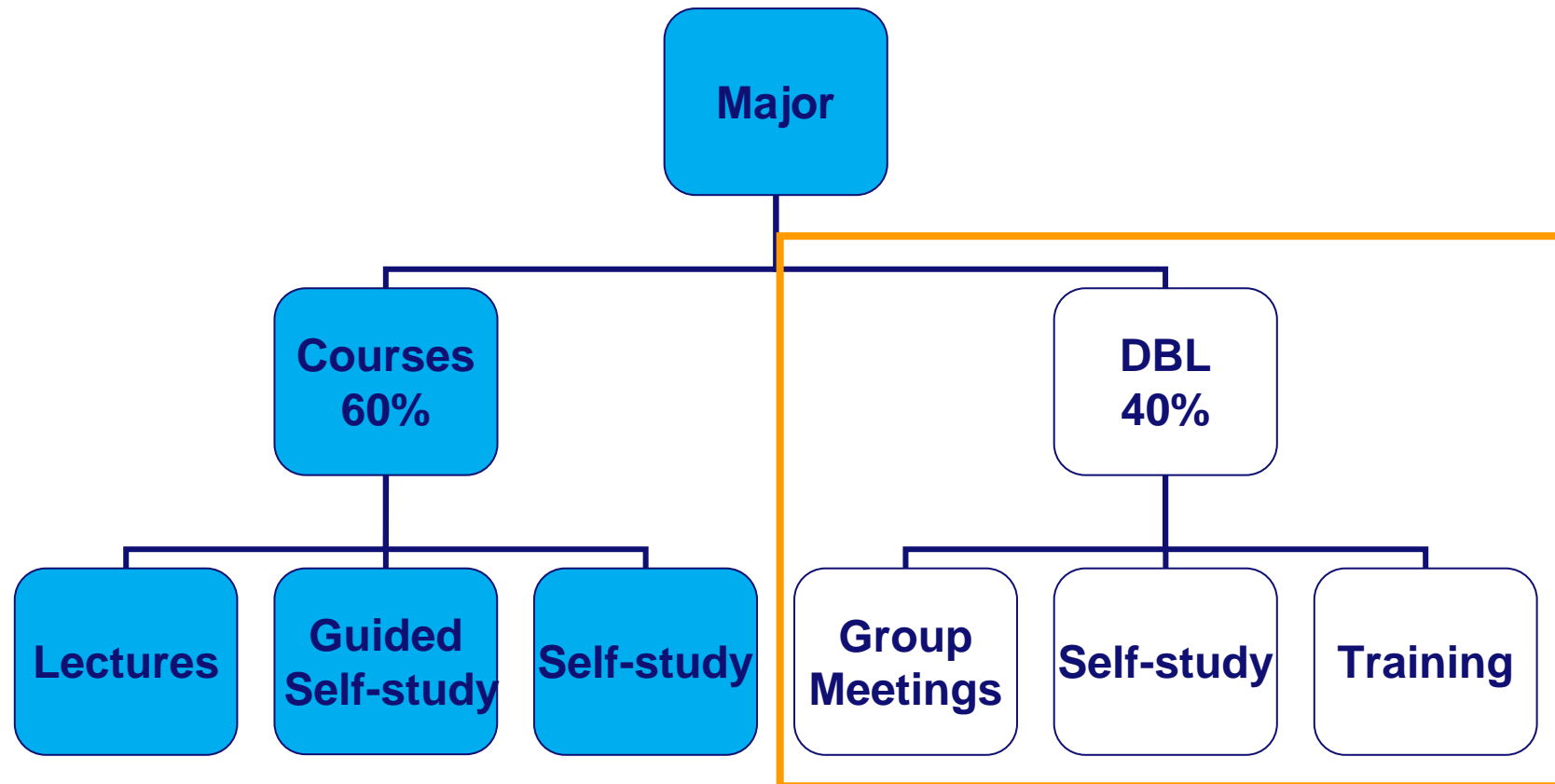


Mechanical engineering *in Eindhoven*



/ name of department

Bachelor structure



Design based learning (DBL)

DEFINITION

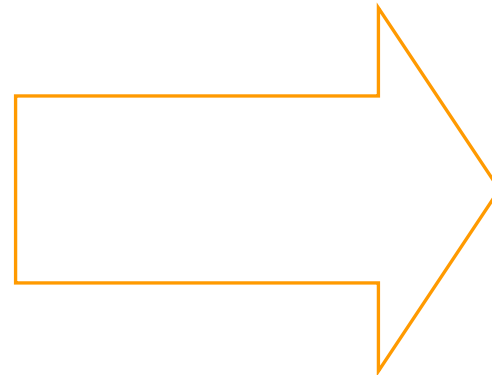
‘a concept of technical university education, in which students work co-operatively and actively on multidisciplinary design tasks, with the purpose of gaining qualifications as creative professionals capable of integrating all relevant aspects of education, in order to analyse existing technical systems, to assess their quality, functionality and cost price and with the purpose of designing new products and systems with increased performance’.

DBL Group

- **8 Members with rotating tasks:**
 - **Chairman/Discussion leader**
 - **Secretary**
 - **Whiteboard writer**
 - **Group member**
- **Tutor**

Tutor

Teacher



Observer

Tutors with no specific knowledge about the case-study preferred

Role of the Tutor

- **Motivator**
 - **Feedback**
 - **Assessment**
 - **Guardian of the learning process**
 - **'Hit the brake' (only if needed)**
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- **But not teaching or explanation; students are expected to resolve the problems they encounter**

Working methodology

- **Clarify unclear terms and concepts**
- **Define the problem**
- **Brainstorm**
- **Systematic analysis**
- **Formulate self-study assignments**
- **Execute self-study assignments**
- **Report**

Through the years

-Decrease-
Group size
Duration of the meetings
Guidance

+Increase +
Difficulty
Duration of the case studies
Student influence in assessment

Some examples

First year

Description case study:

Design a construction

Calculate its strength (using a FEM program)

Build the construction

Test the construction



Theory \neq Practice



Some examples

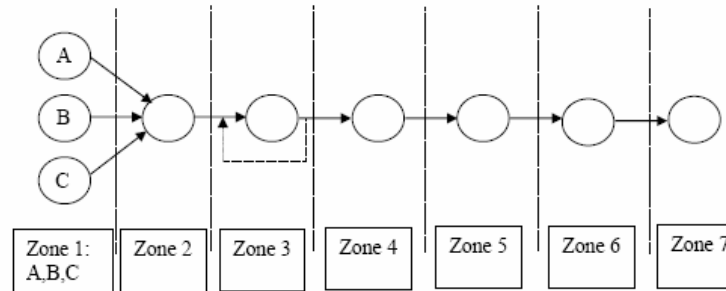
Second year

Description case study:

Design assembly line for
lawnmowers

Analytical and using Chi-
model

Determine number of
workstations, flow time, effect
of parallel batching, **etc.**



Zone 1A: frame pre-assembly
Zone 1B: engine bloc pre-assembly
Zone 1C: pre-assembly lift + mowing mechanism
Zone 2: assembly of the parts pre-assembled in zone 1
Zone 3: assembly of the hydraulics and electronics
Zone 4: assembly of the fuel tank and steering mechanism
Zone 5: assembly of the wheels and protective covers (engine/mow mechanism)
Zone 6: drying the glue (protective covers) In a parallel batch, the products go to the special room for a heat treatment. If the room is empty a batch formed in the buffer goes into it and remains there for the specified processing time. The products from the processed batch are placed in the buffer of the following zone and a new batch can be formed. The process is fully automatic, no operator is needed.
Zone 7: packaging in crates and adding spare parts

