

# CiC NEXTBOOK

Co-created Interactive Courseware

Project No: 2019-1-UK01-KA203-061669

Case study report - KU Leuven: Feedback after mid-term  
test Applied Mechanics Part 1, 2021-2022

Tinne De Laet | KU Leuven  
December 2022



Co-funded by the  
Erasmus+ Programme  
of the European Union

This communication has been produced with the support of the Erasmus+ Programme of the European Union. The contents of this communication are the sole responsibility of the University of Wolverhampton and can in no way be taken to reflect the views of the NA and the Commission.

The course material of this case study report is available here:

<https://nextbook.io/book/modeloplossing-ttt-tm1-2021>

# Table of Contents

1. Context	1
<b>2. Challenge</b>	<b>1</b>
<b>3. Co-creation solution</b>	<b>1</b>
Situation within co-creation framework of Bovill	8
<b>4. Discussion</b>	<b>12</b>
<b>Acknowledgments</b>	<b>12</b>

## 1. Context

This case study reports on an intervention with the interactive courseware platform Nextbook targeted at activating students around the mid-term evaluation (called “tussentijdse toets”) of a first-year bachelor course at KU Leuven.

The case study was executed at KU Leuven in Flanders, Belgium. KU Leuven is a highly ranked research-intensive university both regarding research and education. The course of this case study was a first-year bachelor course in engineering mechanics (Applied Mechanics, part 1), a mandatory course for students in the bachelor of Engineering Science and the bachelor of Engineering Science: Architecture. Applied Mechanics, part 1 is a course with around 700 engineering and engineering architecture students, with a low success rate (around 40%). It is considered to be a hard course by students because it is expected that they can apply basic mechanical principles of statics, dynamics, and kinematics to real-life applications.

## 2. Challenge

In order for students to be successful in their university studies, academic integration of first-year students is key. First-year students have to get familiar with the expectations of university education, especially regarding exams. To this end, the faculty of Engineering Science of KU Leuven organizes mid-term tests for their first-year students. These mid-term tests take place in the middle of the first semester and provide students with a realistic exam-setting both regarding the content of the exam and the exam circumstances. To motivate students to prepare well for the mid-term tests, the final grade of students who pass the mid-term test will consist of 25% of the score of the mid-term test, provided that it improves the final score. As a result, a student’s final score can only improve based on the mid-term test.

Only half of the students of the bachelor of Engineering Science can participate in the mid-term test of the course. The program draws a lot two two weeks before the actual test to decide which students participate in which two mid-term tests of the four mid-term tests offered. For the bachelor of Engineering Science: architecture, all students can participate in the mid-term test.

Within the course of Applied Mechanics, part 1, students are provided with elaborate feedback after the mid-term test. This material is obviously of interest to all students, not only students that participate in the mid-term test.

## 3. Co-creation solution

The feedback after the mid-term test was offered on the Nextbook platform to **727 students**.

In the virtual learning environment of the course students were offered feedback after the mid-term test.

View of the virtual learning environment with the feedback after the mid-term test. The item "Modeloplossing TTT 2021" refers to the material in Nextbook, where the model solution was made available.

The Nextbook platform was used to offer the model solution to the mid-term test, together with statistical information from last year's student cohort.

Modeloplossing TTT TM1 2021

Settings Tinne

# Modeloplossing TTT TM1 2021

Nederlands Lees verder →

- 1 HOE DEZE MODELOPLOSSING GOED TE GEBRUIKEN?**
- 2 GLOBALE RESULTAAT**
- 3 GROTE VRAAG**
  - 3.1 G1
  - 3.2 G2
  - 3.3 G3
  - 3.4 G4
  - 3.5 G5
- 4 CONCEPTVRAGEN**
  - 4.1 C1
  - 4.2 C2
  - 4.3 C3

Archiveren

*Model solution of the mid-term test of 2021 offered as feedback after the mid-term test.*

First, students are instructed on how this model-solution can be used most beneficially, including how they can use the Nextbook functionality for asking questions or discussing the model solution.

Modeloplossing TTT TM1 2021 > Hoe deze modeloplossing goed te gebruiken? Settings Tinne

< ≡ ✎ 📄 💬 📖

1 HOE DEZE MODELOPLOSSI...  
2 GLOBALE RESULTAAT  
3 GROTE VRAAG  
4 CONCEPTVRAGEN

< TERUG > HOOFDSTUK 2 >  
Voorpagina Globale resultaat

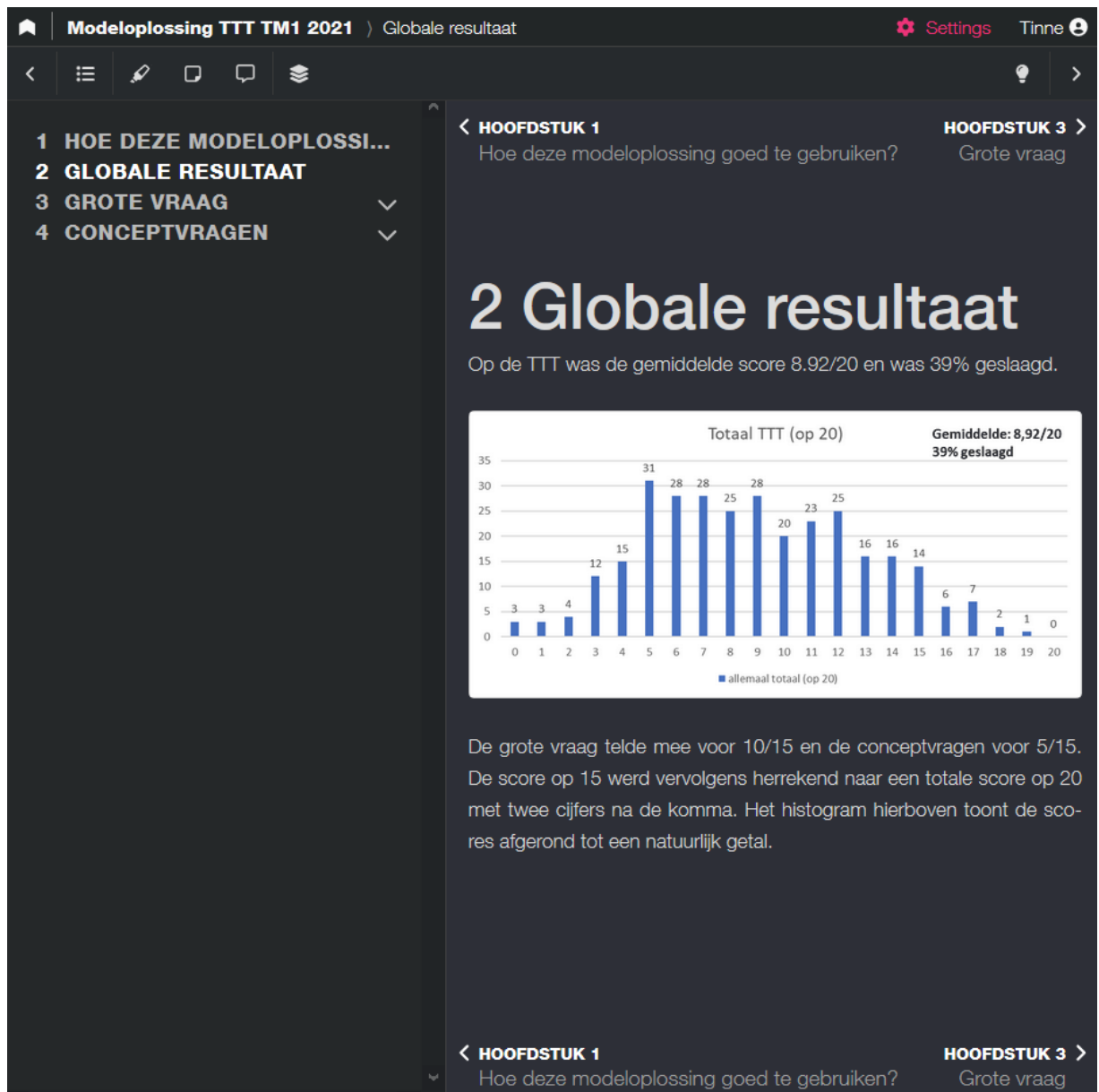
# 1 Hoe deze modeloplossing goed te gebruiken?

- Neem de opgave én je eigen oplossing (van tijdens TTT of daarna) er bij.
- Het is uiteraard belangrijk dat je de opgave eerst zélf probeert op te lossen. Eens je een oplossing ziet lijken heel wat stappen "logisch" terwijl ze dat niet noodzakelijk zijn.
- Er worden telkens aandachtspunten vermeld, op basis van fouten die dikwijls werden gemaakt.
- Er is ook een statistische informatie van de resultaten opgenomen.
- Je kan vragen stellen rechtstreeks op deze modeloplossing door een stuk tekst te selecteren en dan op het tekstballonnetje te drukken

< TERUG > HOOFDSTUK 2 >  
Voorpagina Globale resultaat

*Instructions on how to use this model solution, including instructions on how to ask questions using Nextbook's functionality*

To provide students with information on how students scored on the mid-term test, statistical information on the scores is offered.



*The feedback includes statistical information on the scores of the students on the mid-term test.*

For each of the questions of last year's mid-term test, a hand-written model solution is offered together with points of attention ("aandachtspunten"), and information on the students' scores on the particular question. The points of attention hope to point to important elements and help students prevent typical mistakes.



Modeloplossing TTT TM1 2021 > Grote vraag > ... Settings Tinne

3.1 G1

Selecteer deze tekst om een toelichting of verduidelijking te vragen over de oplossing van deze deelvraag.

A) 
$$\vec{r}_c = \frac{m_{\text{kolom}} \vec{r}_{\text{kolom}} + m_{\text{laadpaal}} \vec{r}_{\text{laadpaal}}}{m_{\text{kolom}} + m_{\text{laadpaal}}}$$

$$= \frac{750\text{kg} \begin{pmatrix} 0 \\ 2,30\text{m} \\ 0 \end{pmatrix} + 500\text{kg} \begin{pmatrix} 1,950\text{m} \\ 4,600\text{m} \\ 0 \end{pmatrix}}{750\text{kg} + 500\text{kg}} = \begin{pmatrix} 9,740\text{m} \\ 3,250\text{m} \\ 0 \end{pmatrix}$$

Aandachtspunten:

- Antwoord is een positievector
- Eenheden niet vergeten.
- Het globale zwaartepunt ligt rechts van de verankering en hoger dan de helft van de lengte van de verticale kolom.

Punten

- Deze vraag telde mee voor 0.5 van de 10 punten op de grote vraag.
- Gemiddelde score: 0.383/0.5

< HOOFDSTUK 2 > SECTIE 3.2 >  
 Globale resultaat G2

*For each question a hand-written model solution is offered together with points of attention (“aandachtspunten”), and information on students’ scores on the particular question.*

Modeloplossing TTT TM1 2021 Grote vraag G5

1 HOE DEZE MODELOPLOSSING GOED TE G...  
 2 GLOBALE RESULTAAT  
 3 GROTE VRAAG  
 3.1 G1  
 3.2 G2  
 3.3 G3  
 3.4 G4  
 3.5 G5  
 4 CONCEPTVRAGEN

Handwritten notes on grid paper:

- Top left:  $\vec{F}_C = \begin{pmatrix} -F_C \cos \theta \\ F_C \sin \theta \end{pmatrix}$
- Top right:  $\vec{F}_B = \vec{F}_C \parallel \vec{BC}$
- Bottom left:  $\vec{F}_C = \begin{pmatrix} -F_C \cos \theta \\ F_C \sin \theta \end{pmatrix}$
- Bottom right:  $\vec{F}_B = F_{zuiger} \begin{pmatrix} \cos \theta_B \\ \sin \theta_B \end{pmatrix}$

Handwritten text: "opmerking: uit evenwicht BC volgt"

Aandachtspunten

- Vrijmaken van juiste systemen. Het laadmechanisme heeft interne vrijheidsgraden, waardoor je hier de verschillende onderdelen nog apart moet vrijmaken: staaf AD, BC en CDE.
- Dit is geen vakwerk aangezien er niet aan de voorwaarden voldaan is: er grijpen ook krachten aan buiten de knooppunten (kracht in punt D die ergens op staaf CDE ligt) én er is een extern moment rond punt A. Hierdoor zijn er niet enkel krachten gericht volgens de staven, maar ook krachten loodrecht op de staven.  
Opmerking: enkel staaf BC fungeert als een "vakwerkstaaf", waar de krachten volgens de staaf en dus volgens de zuiger, gericht zullen zijn.
- Correct invoeren van krachten: reactiekracht in A én reactiemoment (van motor) in A, reactiekracht in B (of meteen te tekenen als zuigerkracht volgens de staaf BC), verticale drukkracht van bus in E, reactiekrachten in verbindingpunten C en D volgens wet van actie- en reactie.

Punten

Ik snap niet goed waarom we hier verschillende onderdelen moeten vrijmaken en niet het geheel

Als je het geheel vrijmaakt, dan is de zuigerkracht een interne kracht, en zal die niet voorkomen in het vrijlichaamdiagram, niet in de evenwichtsvergelijkingen.

Antwoorden  
Verzenden

Example of student (name blanked out) interacting with the model solution and receiving an answer of the teacher.

## Situation within co-creation framework of Bovill

We situate the co-creation solution within the framework of Bovill, 2019.

Question	Possible responses							
Who initiates the co-creation?	Staff-led	Student-lead	Staff and students					Other (elaborate)
What is the focus of the co-creation? (see Bovill & Woolmer, 2018; Healey et al., 2014)	Entire curriculum (co-creation of the curriculum)	Learning & teaching (co-creation in the curriculum)	Educational research & evaluation	Disciplinary research	Wider student experience			Other (elaborate)
What is the context for the co-creation? (see Bovill & Woolmer, 2018; MercerMapstone et al., 2017)	Curricular	Extra-curricular	University-wide					Other (elaborate)
How many students are involved? (see Mercer-Mapstone et al., 2017)	1-5 (specify specific number)	6-10 (specify specific number)	11-20 (specify specific number)	21-30 (specify specific number)	31-100 (specify specific number)	101-500(250)	>500 (727)	Other (elaborate)

Have you selected students from a larger group or are you involving a whole class? (See Bovill, 2019; Bryson et al., 2015)	Selected	Whole class/group						Other (elaborate)
Which students are involved? (See Bovill, 2014)	Retrospective	Current	Aspiring/Future					Other (elaborate)
What year of study are the students in?	First -year of Bachelor	Bachelor later than 1st year	Master	Master after Master	PhD	Postgraduate	Lifelong-learning	Other (elaborate)
What is the scale of the co-creation?	1 class/interaction moment	several classes / interaction moments	1 project	several projects	Entire course	Faculty/school-wide	Institution-wide	Other (elaborate)
How long does the co-creation last?	Days	Months	Years					
What is the role of the student? (See	Representative	Consultant	Co-researcher	Pedagogical co-designer	Participant			Other (elaborate)

Bovill et al., 2016)								
What is the nature of student involvement? (See Bovill, 2017; Könings et al., 2017)	Informed	Consulted	Co-researcher	Pedagogical co-designer	Contributor			Other (elaborate)
What is the nature of reward or recompense given to students?	Payment in money	Payment in vouchers	Course credit	Refreshments	No payment or reward			Other (elaborate)
What is the goal of the co-creation?	To improve the course	To enhance student engagement	Aiming for a socially just higher education	To get the benefits of co-creation in the course	Incorporating the student perspective	To enhance student's skills		Other (elaborate)
....								

## 4. Discussion

In the academic year 2021-2022 all 727 students in the course were enrolled in the Nextbook handbook supporting the feedback after the mid-term test.

For the feedback on the mid-term test merely five questions were asked through the Nextbook platform. Students prefer to use the tools used for other material in the course to ask their questions: the discussion forum on the virtual learning environment, or ask their teaching assistants in class.

Therefore, we learned that if we want to promote interaction and co-creation through a platform such as Nextbook, that this platform should be preferably used more intensively in the course and from the beginning of the course itself. Furthermore, the interaction and co-creation should be more actively stimulated especially with first-year students and large classes.

## Acknowledgments

We gratefully acknowledge the support of the European Erasmus+ programme for the project “Co-created Interactive Courseware”, with project-number 2019-1-UK01-KA203-061669. This publication has been produced with the support of the Erasmus+ Programme of the European Union. The contents of this publication are the sole responsibility of the project Consortium and can in no way be taken to reflect the views of the Commission.