

PRIMECH Events Report

About

This report includes the events organized by the PRIMECH Team from June 2022 to June 2024, along with links to relevant results and recordings.

Goal

The events aimed to PRIMECH's objectives of offering domain-specific support to teachers, sharing best practices and creating a community of practice.

Participants

The participants included TU Delft staff involved in mechanics education (teachers and support staff).
Average number of participants per event: 20-30

More information and resources about the project can be found on www.primech.nl

Social Lunch

Getting to know each other

21-06-2022

PRIMECH community

✓ About

The first PRIMECH event was the social lunch, all TUDelft Mechanics teachers and stakeholders were invited to discuss together their vision on Mechanics education and teaching challenges. Through group activities, attendees developed shared perspectives on Mechanics, mapped fundamental concepts, and identified key teaching challenges. Insights included a shared definition of the challenges to be addressed together, such as conceptual understanding and students' transition from high school to university studying mentality. Participants found value in being a part of a community of practice, and so the Mechanics Teachers Social Club was launched.

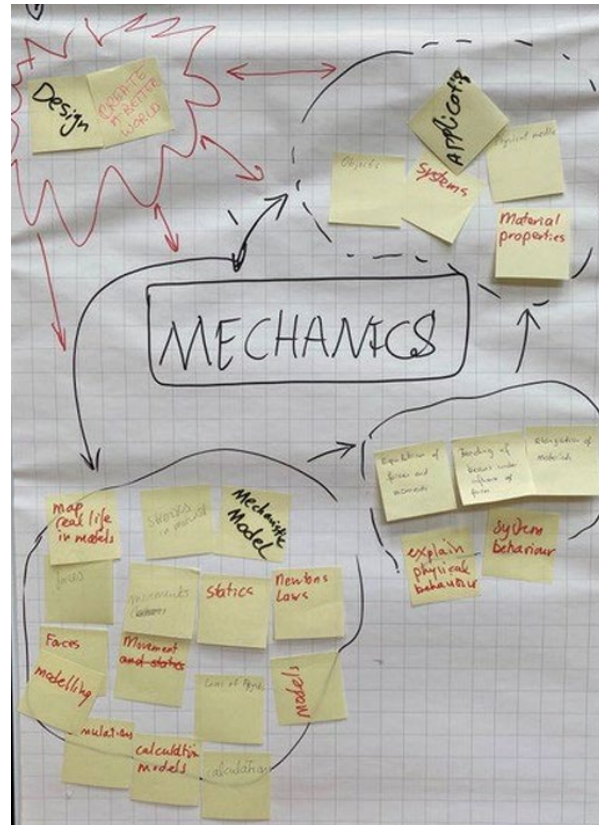


Social Lunch

Getting to know each other

21-06-2022

PRIMECH community



✓ Results

- Report (available for download) on teachers' shared vision on mechanics education:
 - Shared definition of mechanics (Results of activity 1).
 - Mind maps of Mechanics main concepts (Results of activity 2).
 - List of main challenges of teaching mechanics (Results of activity 3).

Graph Workshop

Course Graph for concept-mapping

26-10-2022

Beryl van Gelderen

Marijn Roelvink

✓ About

The Course Graph workshop, led by Beryl van Gelderen and Marijn Roelvink, provided hands-on experience with Course Graph editor, a concept-mapping tool for visualizing course structure and therefore enhancing student understanding. Mechanics teachers, blended learning developers and study coordinators collaborated to build interactive concept maps for their courses, starting with defining course domains and progressing to linking key concepts to lectures. The exercise revealed some issues in the courses structures and in identifying the main course concepts, domains but emphasized the importance of this step in clarifying course structure. Teachers recognized the value of embedding Course Graphs in Brightspace for student visualization and expressed enthusiasm for integrating them into mechanics courses.



Graph Workshop

Course Graph for concept-mapping

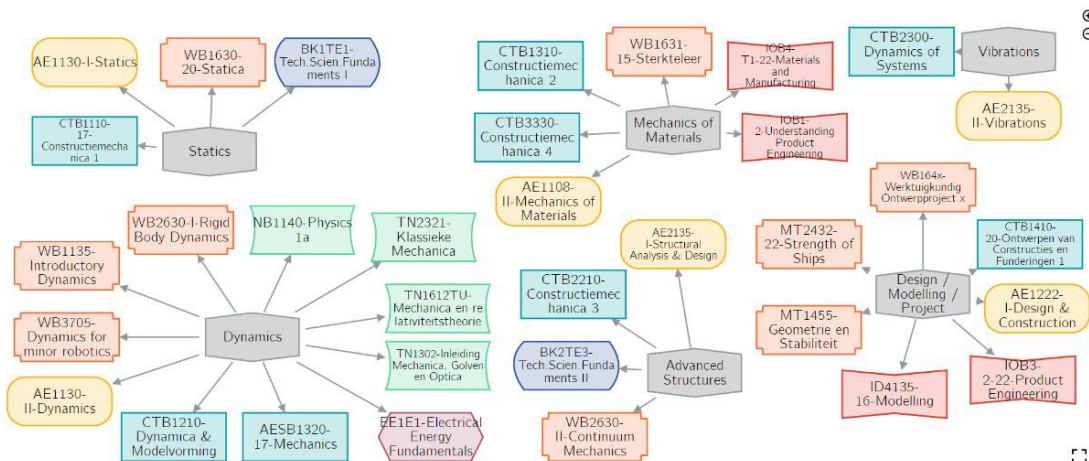
26-10-2022

Beryl van Gelderen

Marijn Roelvink

Results

- Booklet / manual: how to use the Course Graph tool (available for download).
- “PRIMECH Mechanics” subfolder in the Course graph repository, so teachers can easily view and copy course structures from colleagues of other faculties.
- PRIMECH courses overview.
- Feedback collection for course graph developers to improve the tool.



<https://prime-applets.ewi.tudelft.nl/graph/0000/show>

Holidays borrel

Networking event

01-12-2022

PRIMECH community

✓ About

This event was a mix of fun idea exploration and networking. The event began with a game called 'object-oriented teaching,' where each group used a random household object to explain a mechanics concept. Creative ideas emerged, inspiring new classroom demonstration activities. The winners of the challenge won the PRIMECH coffee cup. The event concluded with a feedback session in which the teachers were asked to share ideas and suggestions on how to grow the PRIMECH community over food and drinks.



Holidays borrel

Networking event

01-12-2022

PRIMECH community

OBJECT-ORIENTED TEACHING

GROUP nr. ____

GAME OVERVIEW

In this game, you will create a short demonstration in which you use a random object in combination with crafting materials to explain a mechanics concept. You will present to both the other competing teams and a group of guinea pigs.

The best demonstration wins. It will be judge based on originality, understandability and the contribution of the object to the explanation.

The goal is to have fun, collaborate, and get creative with your mechanics teaching!

0. QUICK PREPARATION (5 min)

TEAM NAME: What do you have in common? Pick a fun name that describes your group. Write your team name below!

TEAM LOGO: Use the available crafting materials to create a team logo. The team logo will represent you in the competition.

TEAM NAME:

1. WHAT IS THIS? (2 min)

I would like an event on this topic..

- Didactics
- Rethinking teaching methods
- Productive failure
- Demonstrations: teaching material and physical tools
- Visualization tools
- Teaching basic fundamentals
- Maths-Physics connection
- Reflection/intervision
- Digital assessment
- Assessment



Results

- We developed the game 'object-oriented teaching" (report available for download) to help teachers develop mechanics demonstrations.
- Through a polling activity, we collected community inputs on the following topics (report available for download):
 - List of the biggest challenges in teaching Mechanics
 - The support PRIMECH could offer
 - Topics for future events
 - How to better communicate within the community

Get your demos on

Classroom demonstrations for Mechanics

26-01-2023

Ron Haaksman

✓ About

The event featured a presentation on Ron's extensive demo system that sparked engaging discussions among attendees. Key topics included managing logistics, ensuring student engagement, and selecting demo topics. Attendees exchanged ideas and gained insights into designing interactive demonstrations to enhance student understanding of theoretical concepts.



✓ Results

- Teachers got an overview of the set ups available from the faculty of applied science (<https://www.de-monstrare.nl/>)
- Teacher from different faculties started collaborating with Ron to use his set ups for their lectures.
- Started a channel in Teams where mechanics teachers can share their demonstrations.

ANS Formative Assessment

Effective formative assessment with ANS

16-03-2023

Tom van Woudenberg

Calvin Rans

✓ About

Speakers Tom van Woudenberg and Calvin Rans shared successful strategies for implementing formative assessment in first-year statics courses.

Tom presented a way for students to self-assess using rubrics, while Calvin introduced the "honest attempt at solving exercises" system. The discussion touched on topics such as the use of variable numbers in ANS exercises and the organization of TA training for grading.

Participants also explored the idea of sharing question banks in ANS to alleviate the burden of assessment development, with PRIMECH working on a shared tagging system. Despite varied approaches, the event highlighted the ongoing need for intuitive resource-sharing solutions.



Gamification Large Classes

Gamification to enhance student engagement

03-04-2023

Otto Visser

✓ About

PRIMECH hosted a gamification event featuring Otto Visser from EEMCS, who shared his experiences using gamification strategies to enhance student engagement and motivation in his Computer Organisation course. Otto identified four student types and tailored learning activities accordingly, employing a point system as a base structure. Practical tips were shared, and a Q&A session addressed specific implementation details. While setting up gamification requires investment, the potential benefits include higher passing rates and student satisfaction.



From Math to Mechanics 1

Discussions between math and mechanics teachers

25-05-2023

PRIME Tom Vroegrijk

✓ About

The workshop brought together mechanics and mathematics teachers, students, and learning developers to address challenges in integrating mathematics into mechanics courses. The event started with a presentation by Tom Vroegrijk showcasing PRIME teaching materials designed to visualize abstract mathematical concepts in engineering. After that, participants were asked to engage in a collaborative activity to identify the challenges and propose initial solutions, setting the stage for further exploration in future events. Three main areas of concern emerged: the disconnect between math and mechanics, exam focus over understanding, and knowledge transfer issues.



From Math to Mechanics 1

Discussions between math and mechanics teachers

25-05-2023

PRIME Tom Vroegrijk



From Math to Mechanics: The mystery of the missing link

QUICK PREPARATION

This activity is going to be fun! But before you start, you need to define some roles:

THE INVESTIGATOR TEAM:

SHERLOCKS: "brilliant detectives", mathematics lecturers who will lead the investigation by interviewing the witnesses.

WATSONS: "sympathetic sidekicks", not-mathematics lecturers (i.e. learning developers, researchers,...) who will help the Sherlocks.

NOTE -TAKER: Takes care of the activity sheet, reads the task aloud, and writes down discussion outcomes on the flip chart once consensus is reached. Note taking is essential for the success of investigations!

OPERATIONS MANAGER: In this strategic role, you'll drive the performance of the team. This will involve making sure every task is finished on time :)

THE WITNESSES: Have partial knowledge of the mystery, from observation or experience, i.e. the mechanics lecturers, teaching assistants and students who will be interviewed.

THE MYSTERY:
In the hushed corridors of academia, a perplexing enigma looms large. The whispered question is this:

"What are the mysterious challenges that hinder students' seamless use of mathematics in the study of mechanics?"

0. SHARE YOUR IDENTITY! (duration: 2 min.) To work well together, do a quick introduction round where you'll get to know your teammates better.

A hand-drawn form for an investigation file. It includes fields for 'INVESTIGATION FILE NO:', 'INTERVIEWED WITNESSES:', 'COURSE:', and 'INVESTIGATORS PRESENT:'. There is a 'CONFIDENTIAL' stamp at the bottom right.

Results

- We developed a game and an activity sheet (available for download) to investigate the missing link between math and mechanics.
- Report (available for download) with identified challenges and proposed solutions.
- Spin-off Accelerate project: Collaboration between math and mech teachers of the AE faculty to better align these courses in the bachelor curriculum.

VrijMiBo + Accelerate

Laid-back closure of the year

16-06-2023

PRIMECH community

✓ About

The end-of-the-year "vrijmibo" event featured drinks, discussions, and plans for the upcoming academic year, starting with the launch of PRIMECH Accelerate, a new initiative booster for mechanics-related education projects. Participants engaged in a game which included group brainstorming sessions to generate new initiatives, tackling challenges such as creating a teaching module for 900 bachelor students with no budget or teaching assistants. The results showcased creative and innovative ideas.



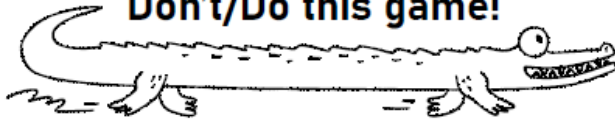
VrijMiBo + Accelerate

Laid-back closure of the year

16-06-2023

PRIMECH community

Alligator tank: Don't/Do this game!



HOW TO PLAY:

OVERVIEW:

Welcome to the PRIMECH Accelerate game!

Step into the role of a mechanics teacher with an innovative idea.

Develop your idea (Part 1), pitch it to the PRIMECH team (Part 2a), and receive their support proposal in making it happen (Part 2b). Join us and experience the power of collaboration and innovation in mechanics education!

Part 1, 10 min:

Each team randomly picks 3 "Do" cards. These define the project requirements. Additionally, teams also pick 2 "Don't" cards, which impose (absurd) limitations.

Remember, you can't exchange individual cards unless you swap your entire set!

Put on your thinking cap and devise innovative concepts that meet both the requirements and limitations. Let the creativity flow! :)

✓ Results

- We developed a card game (available for download) called Alligator tank, to launch the Accelerate initiative. The game is designed to spark teachers' creativity in developing instructional solutions in mechanics.
- Mechanics teachers made new connections with colleagues from different faculties as they got to work together in randomly formed teams

Kick-off / Catch-up

Catching up after the summer break

23-10-2023

Daniël Peeters
Ines Uriol Balbin

✓ About

The kick-off event for the academic year 23'/24' with the PRIMECH community was filled with exchanges of plans and ideas.

Daniël Peeters and Ines Uriol Balbin showcased their PRIMECH Accelerate projects, focusing on connecting Mechanics of Materials exercises to real-life sustainable aviation projects and creating an active learning experience with a Mars Rover VR activity, respectively. Participants also shared their educational achievements from the past year and discussed future challenges and goals. Feedback from the event highlighted a desire for alignment with other faculty practices, inspiration, and practical examples of mechanics in practice in future events.



Kick-off / Catch-up

Catching up after the summer break

23-10-2023

Daniël Peeters
Ines Uriol Balbin

| WHEN I ATTEND PRIMECH EVENTS, I LOOK FOR... | votes |
|---|-------|
| Alignment with other faculty practices | 8 |
| Examples of applications of mechanics in practice | 5 |
| Inspiration | 4 |
| Linking faces to names | 3 |
| Share great ideas for improving lectures/courses | 3 |
| Inspiration how to tackle/explain problems | 3 |
| Learn from others | 2 |
| Interdisciplinarity in mechanics | 2 |
| Inspiration | 2 |
| Best practices | 2 |
| New ideas for class | 0 |

✓ Results

Report (available for download) with community members' answers to polling questions:

- What type of mechanics course do you teach?
- What educational improvements are you most proud of accomplishing last year?
- What is your main challenge in teaching mechanics that you want to tackle this year?
- When I attend Primech events, I look for...

Digital Assessment Tools

Hosting large cohorts of students

13-12-2023

Tom van Woudenberg
Dennis den Ouden-van der Horst

✓ About

The Digital Assessment Tools event hosted by PRIMECH aimed to foster community engagement by celebrating together holiday season, while introducing attendees to innovative assessment methods. Attendees received custom-made chocolate bars and a printed calendar featuring upcoming events.

Tom van Woudenberg updated the community about the use of students' self-assessment in ANS which received positive feedback from students. Dennis den Ouden-van der Horst showcased the implementation of Schoology, which allows “bring your own device” digital exams. A hands-on workshop was conducted by Dennis later in the afternoon, providing attendees with practical guidance on using Schoology and highlighting its potential for scaling-up digital exams, without limitations of computer rooms availability.



Exam Questions

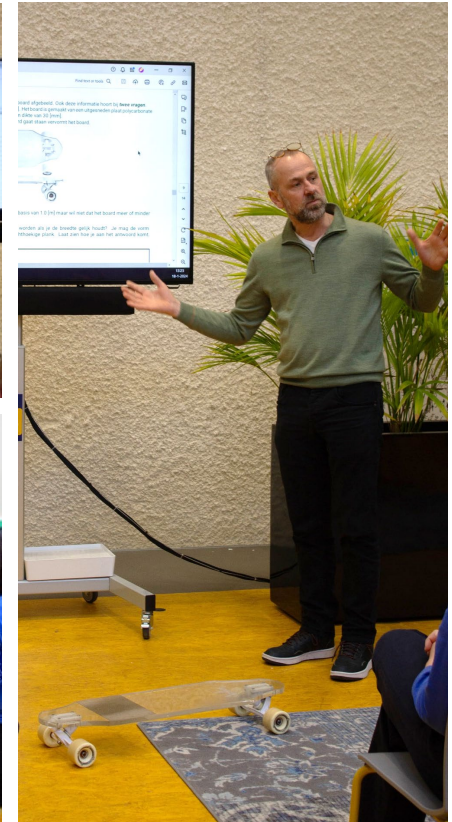
Showing and discussing exam questions

18-01-2024

PRIMECH community

✓ About

The event focused on sharing best practices about mechanics summative assessments. Participants shared insights on what makes a good exam question, exam structure, assessment tools, and whether to keep exam questions confidential. Clarity and feasibility for students emerged as key challenges. Some teachers showcased their own exam questions and discussed student comprehension, highlighting what worked and what didn't. The event concluded with a group discussion. Community members' feedback about this event format was very positive.



Exam Questions

Showing and discussing exam questions

18-01-2024

PRIMECH community

According to you, what are 3 characteristics that make an exam question good?

| | | | |
|--|--|--|--|
| Fair Reproducible Clear | Clarity, mix solving and understanding, manageable to grade | Applicability Critical thinking Challenging | Understanding level Clear Easy to score |
| Discriminating | Simple, interesting, thorough | 1. Unambiguous 2. Representative 3. Straightforward | Clear Doable Check understanding |
| Clearness modularity | Questions a learning goal Understandable | Test understanding Covers most material Teaches the students | Clear structure/picture Challenging with several steps |
| Coverage of learning objective Makes distinction | | | |

✓ Results

Report (available for download) with community members' answers to polling questions:

- In one word, what is the biggest challenge and struggle regarding mechanics exam questions?
- What system/tool do you use for the exam of your course?
- According to you, what are 3 characteristics that make an exam question good?
- Do you share the exam questions with the students after the exam?

From Math to Mechanics 2

PRIME Catalogue and MOOC

28-02-2024

Beryl van Gelderen

✓ About

The 'From Math to Mechanics 2' event addressed again the challenge of students struggling to apply math concepts in mechanics courses. Some practical solutions were discussed. The launch of the PRIME Catalogue, featuring 190 math teaching resources searchable by keywords, can assist mechanics teachers in bridging this gap. Additionally, the Mastering Mathematics for Engineers MOOC was presented as a tool for master students to refresh math skills.



VR, Floods and Rovers

PRIME Catalogue and MOOC

10-04-2024

Alexandra Gavriilidou

Ines Uriol Balbin

✓ About

The "VR: Floods and Rover" event hosted featured presentations by guest experts Alexandra Gavriilidou and Ines Uriol Balbin about their PRIMECH Accelerate projects. Alexandra introduced her VR "Dynamics Escape Room," while Ines presented "Mission M.A.R.I.J.N" for first-year AE bachelor students. Both activities aim to enhance learning through immersive experiences. Attendees learned about the development process, lessons learned, and future refinements. The event showcased the potential of immersive learning to boost student engagement and understanding.



[Recording link](#)

Sustainability in Mechanics

Sustainability in Education

16-05-2024
Monika Roeling
Daniël Peeters

✓ About

The PRIMECH event featured guest speakers Monika Roeling and Daniël Peeters discussing sustainability in education. Monika introduced the GreenDatabase, listing TU Delft courses with sustainability topics, and shared her team's framework to help integrate these topics into courses. Daniël presented his Accelerate project, which linked Mechanics of Materials assignments to AeroDelft's hydrogen plane, using 3D models to connect theory to real-world structures and collaborating with the AE Green Team for additional content. The event emphasized the importance of closely linking sustainability content to course material, inspiring more teachers to incorporate sustainability into their courses.



Season finale

Sustainability in Education

16-05-2024

PRIMECH community

✓ About

This gathering was the celebration of the current core team's three years efforts, of our community's achievements and of the conclusion of the academic year. The event began with a networking community lunch, followed by a presentation of PRIMECH's origins, achievements, and plans for the future. Present mechanics teachers provided very positive feedback about being part of the community so far. We distributed growing paper cards with goodbye messages and gifted plants to award the most active members of the community. The Alligator Tank game followed, where teams brainstormed future PRIMECH activities.

