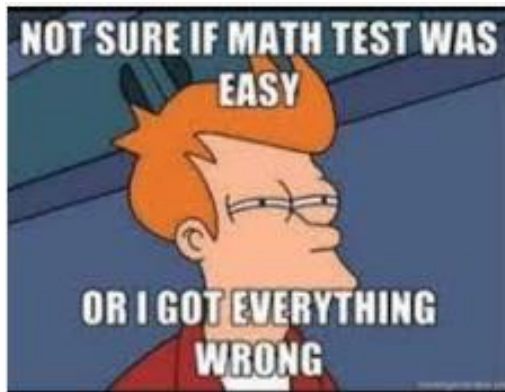


**Bridging the gap: A mathematics intervention to enhance inclusivity
and success in university economics
- The case of the University of Agder in Norway.**

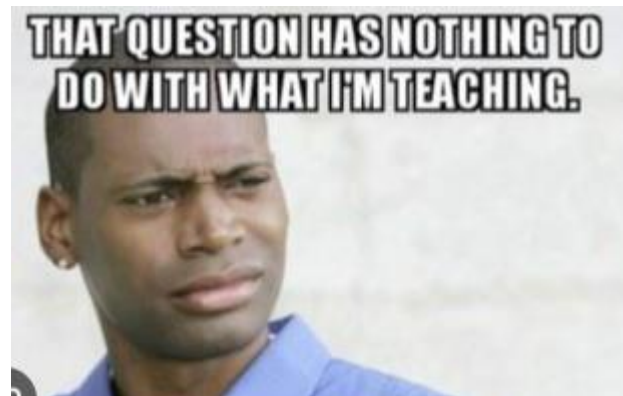
Ida Landgårds-Tarvoll

What does the literature say about issues with the transition to university mathematics in economics education?

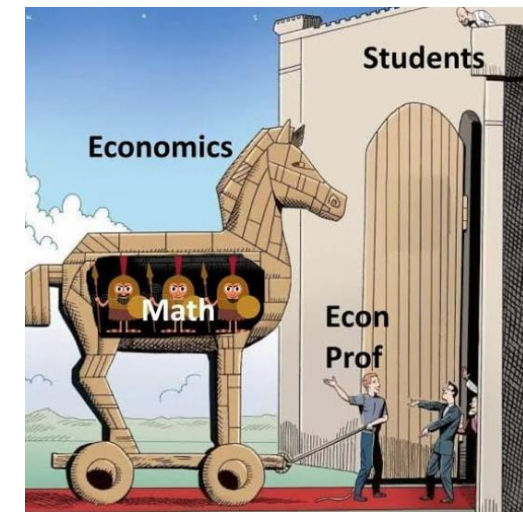
Students' mathematics background



Mismatch in expectations



Relevance

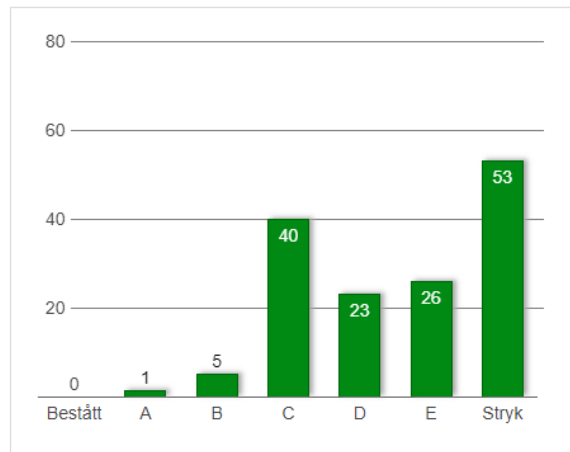


Landgärds-Tarvoll, I. (2024). Understanding the challenges of the secondary-tertiary transition in mathematics for economics in higher education: A Literature Review. *Teaching Mathematics and its Applications: An International Journal of the IMA*, hrad011, <https://doi.org/10.1093/teamat/hrad011>

The situation at the University of Agder

PRE-intervention

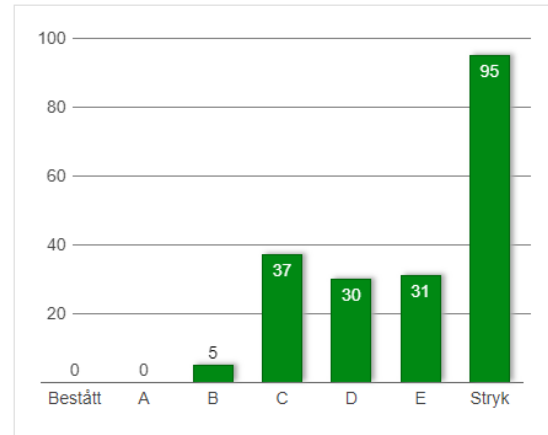
Statistikk for MA-138, Høst 2011, En skriftlig prøve (Ordinær eksamen)



Gjennomsnittlig karakter: D

Failure rate: 36%

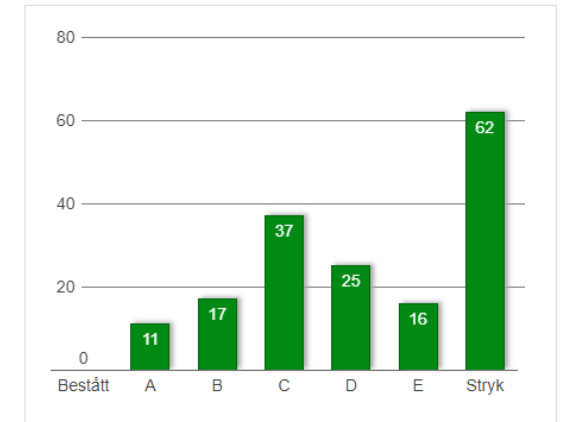
Statistikk for MA-138, Høst 2013, En skriftlig prøve (Ordinær eksamen)



Gjennomsnittlig karakter: D

Failure rate: 48%

Statistikk for MA-138, Høst 2015, En skriftlig prøve (Ordinær eksamen)

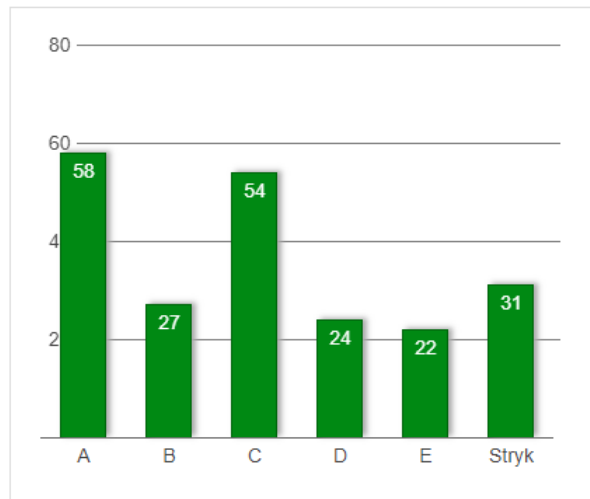


Gjennomsnittlig karakter: C

Failure rate: 37%

The situation at the University of Agder POST-intervention

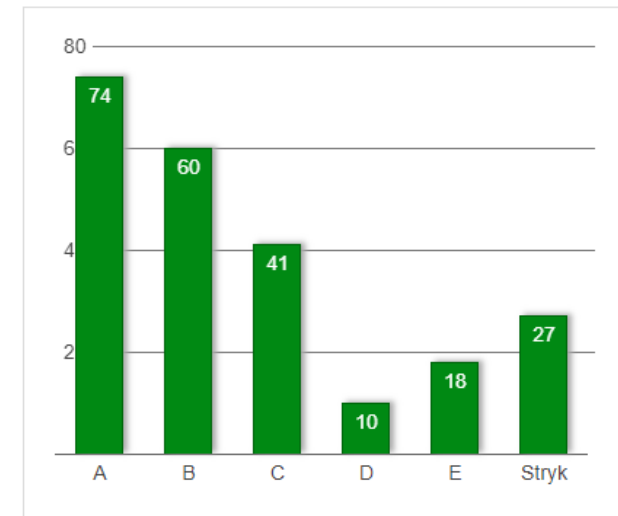
Statistikk for MA-138, Vår 2023, En skriftlig prøve (Ordinær eksamen)



Gjennomsnittlig karakter: C

Failure rate: 14%

Statistikk for MA-138, Vår 2024, En skriftlig prøve (Ordinær eksamen)



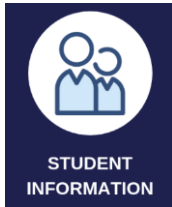
Gjennomsnittlig karakter: B

Failure rate: 11%

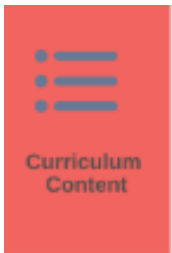
What did we do?



Re-scheduled the mathematics-for-economics course to the first year second semester



Information to first-year students about the mathematics demand, expectations and their responsibility



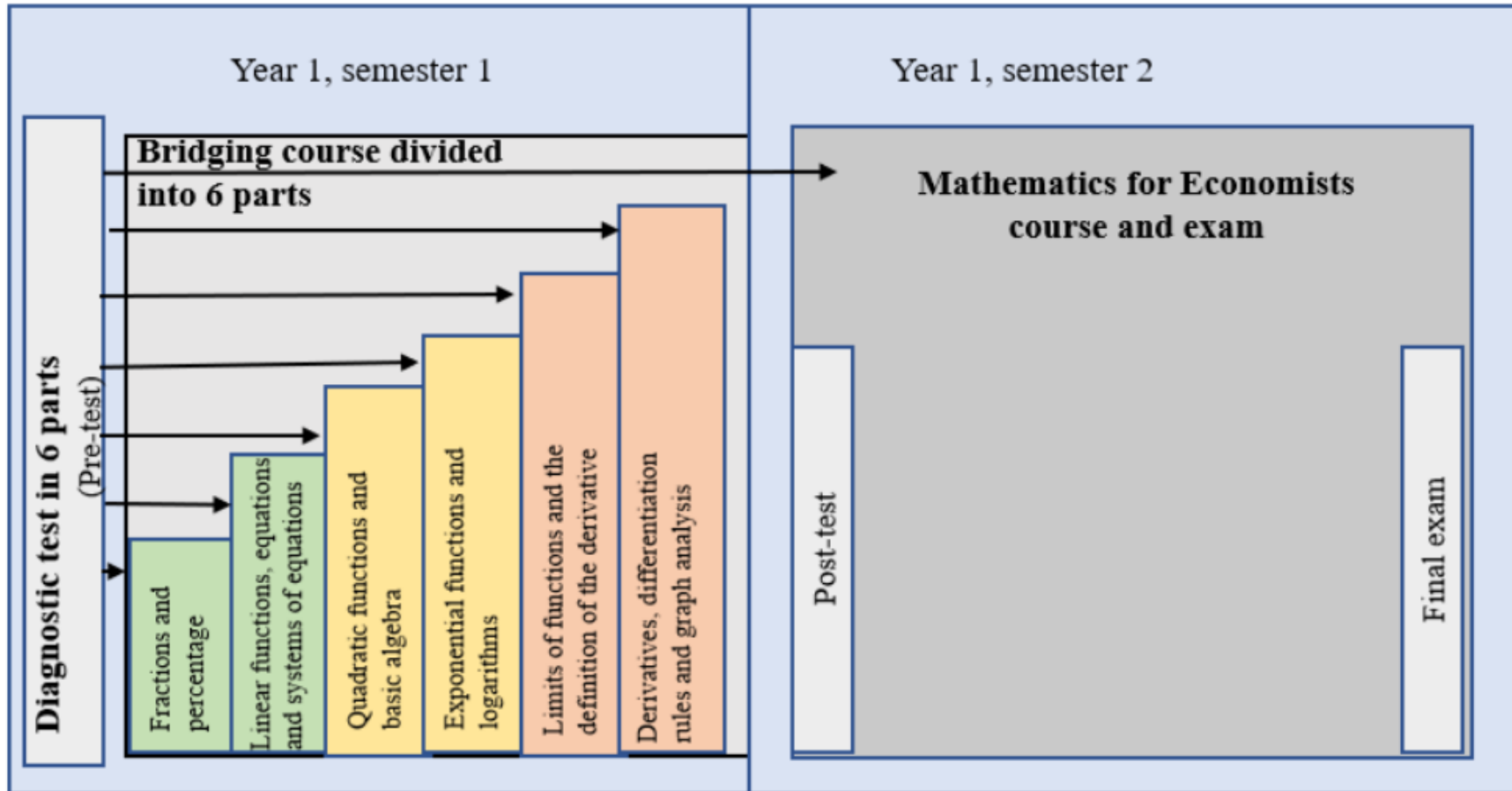
Careful identification of six content gaps between different school mathematics curriculum and mathematics-for-economics curriculum (Norway)

Landgårds-Tarvoll, I. (2024) Bridging the gap: curriculum development addressing the transition into mathematics in economics education. Proceedings of INDRUM 2024, (pp. 406-415). CRM and ERME.

https://indrum2024.sciencesconf.org/data/pages/PreProceedings_INDRUM2024_comprimido.pdf

Design and implementation of a new pre-course intervention in the first semester

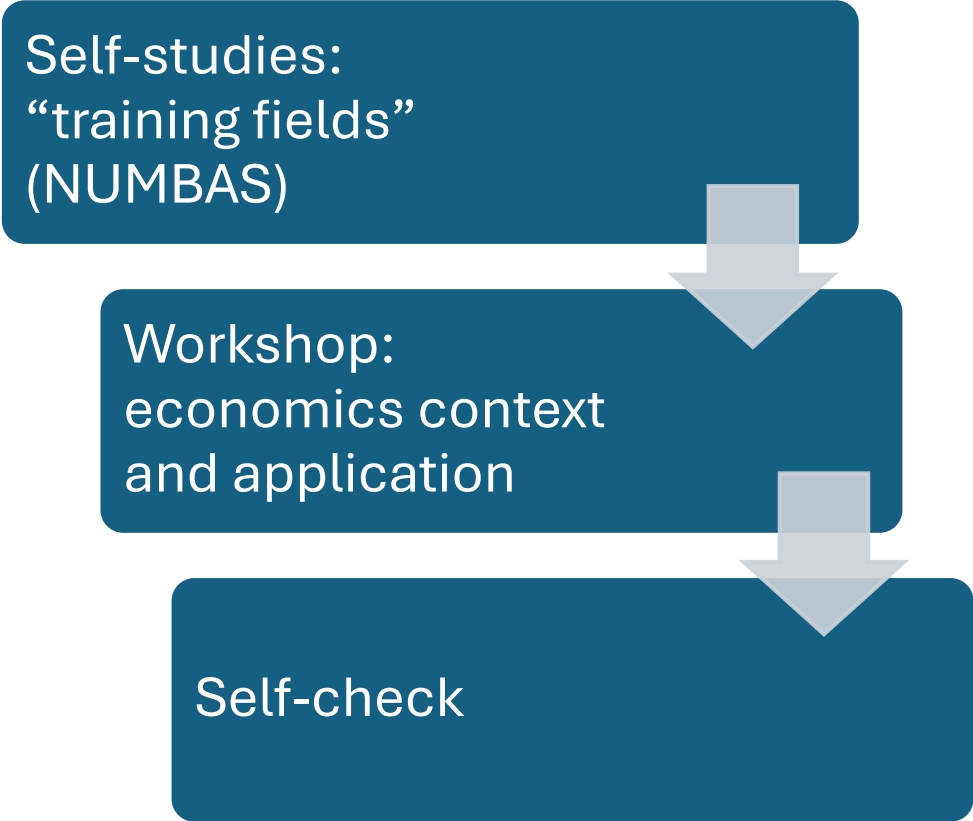
The pre-course intervention



Landgärds, I. M. (2021). "The Impact of a Mathematics Bridging Intervention on the Inclusivity of a University Economics Programme." *Nordic Journal of STEM Education* 5(1). DOI: <https://doi.org/10.5324/njsteme.v5i1.3904>

The pre-course weeks

Self-studies:
“training fields”
(NUMBAS)



```
graph TD; A[Self-studies: "training fields" (NUMBAS)] --> B[Workshop: economics context and application]; B --> C[Self-check];
```

Workshop:
economics context
and application

Self-check

Training field example: logarithms

NUMBAS	
Treningsfelt UKE 38 del 1	
Introduction	
Spørsmål 1	Poengsum: 0/4 Ubesvart.
Spørsmål 2	Poengsum: 0/2 Ubesvart.
Spørsmål 3	Poengsum: 0/4 Ubesvart.
Spørsmål 4	Poengsum: 0/4 Ubesvart.
Spørsmål 5	Poengsum: 0/4 Ubesvart.
Spørsmål 6	Poengsum: 0/3 Ubesvart.
Totalt	0/21

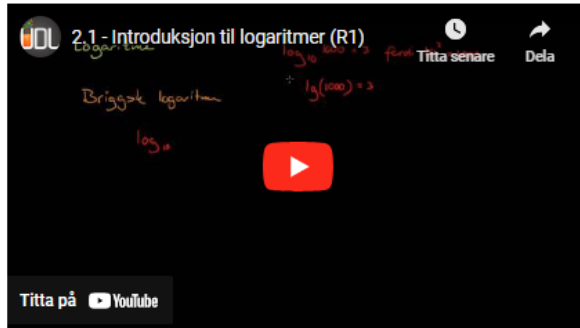
Spørsmål 1

Logaritmer

Ekspensialfunksjonen og eksponensiallikninger dukker ofte opp i økonomiske modeller da størrelser stiger eller faller i verdi over tid. Et eksempel på dette er hvis vi setter kr 3000 inn på en bankkonto med rente 2% pr år, så kan det være interessant for oss å vite hvor lenge det tar før vi har kr 4000 på kontoen. For å løse dette kan vi sette opp likningen:

$$4000 = 3000 \cdot 1.02^x$$

der x er tiden det tar for beløpet å øke til kr 4000. Den ukjente variabelen x befinner seg i eksponenten, derav navnet eksponensiallikning. For å løse slike likninger trenger vi logaritmer. Følgende video gir en introduksjon til logaritmer



Prøv deg nå på å løse disse eksemplene fra videoen

a)

$$\log_{10}(100) = \text{input box}$$

Vis tips (Din score vil ikke bli påvirket.)



Introduction: Addresses the relevance with easy example where students need logarithms

Introduction video: What are logarithms?

Reflection tasks with help

a)

$$\log_{10}(100) = \text{[input box]}$$

Dette tilsvarer ligningen $10^x = 100$

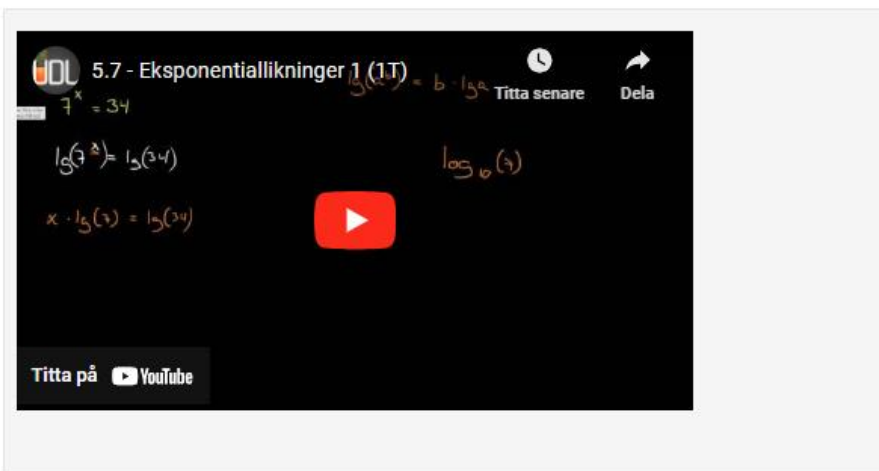
Skjul tips (Din score vil ikke bli påvirket.)

b)

$$7^x = 34$$

$$x = \text{[input box]}$$

(Regn deg frem til eksakt svar. Rund deretter av til to desimaler og før inn svar.)



The video player shows a math tutorial for solving the equation $7^x = 34$. The steps shown are:

$$\lg(7^x) = \lg(34)$$
$$x \cdot \lg(7) = \lg(34)$$
$$x = \frac{\lg(34)}{\lg(7)}$$

The video player interface includes a play button, a title bar with '5.7 - Eksponentiallikninger 1 (1.T)', and a 'Titta på YouTube' button at the bottom.

Skjul tips (Din score vil ikke bli påvirket.)

Reflection tasks with help

- Written explanation
- Similar example
- Graphical picture
- Video

Full solution at the end

b)

$$7^x = 34$$

Da er

$$\lg(7^x) = \lg(34)$$

bruger regel 1.

$$x \cdot \lg(7) = \lg(34)$$

$$x = \frac{\lg(34)}{\lg(7)}$$

vi kan taste inn på kalkulatoren og finne tilnærmet svar

$$x \simeq 1.81$$

Students now:

- understands the expectations
- are aware of their own mathematical knowledge level
- take the responsibility for their own learning.
- Feel happy about the mathematics

Thank you for listening