

REAL teaching

Improving education at MN

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REAL teaching
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My background

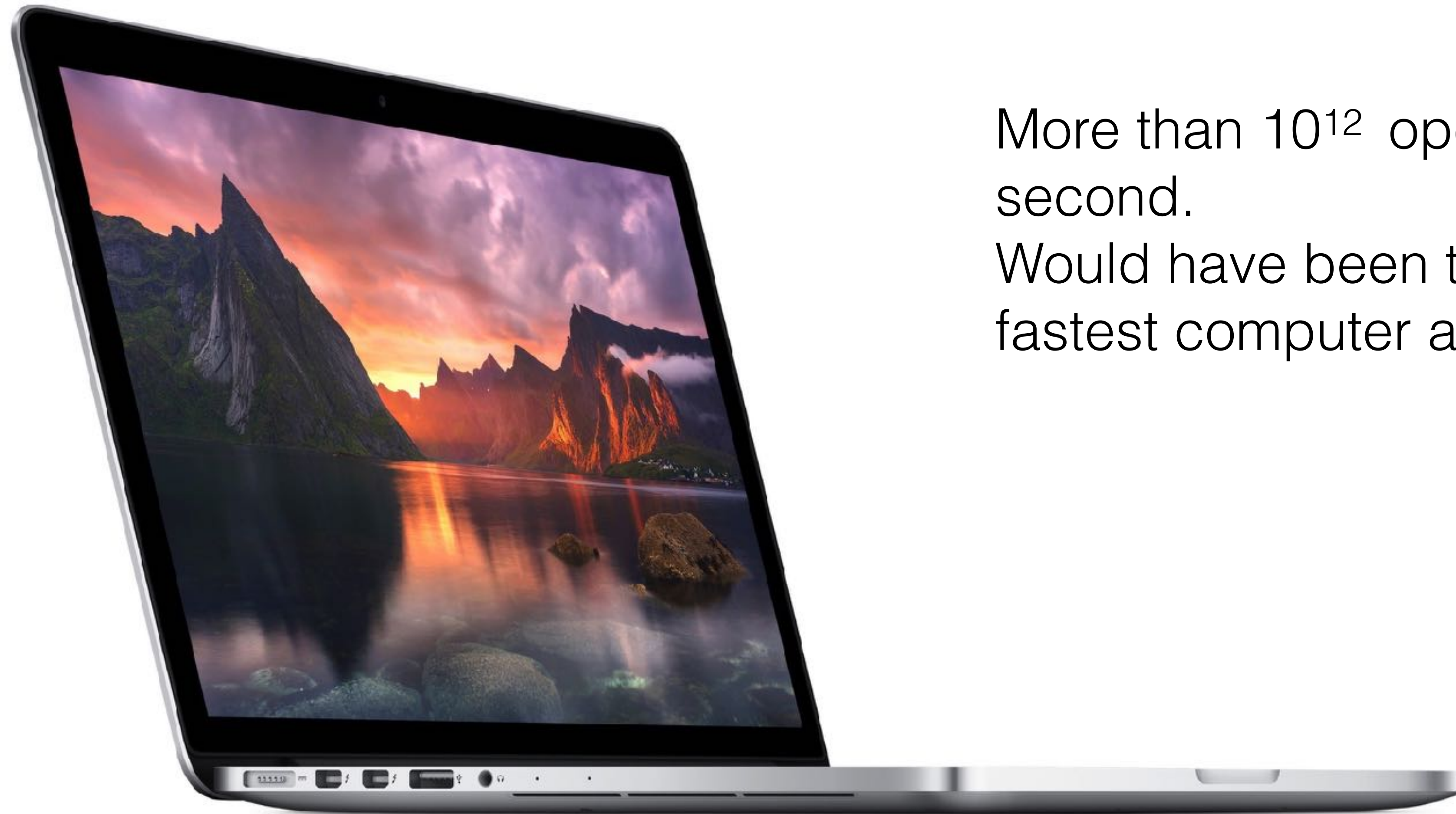
Professor of computational mathematics

Has worked with educational development since 2000

Currently project leader (50 %) for a major revision of all educational programmes



**34 000 000 000 000 000
operations per second**



More than 10^{12} operations per second.
Would have been the world's fastest computer around year 2000.

Computers change
the rules of the game!

Computers change the rules of the game!

These extremely powerful computational tools have had profound effects on research

Has this significantly changed the core of the elementary curriculum in science and mathematics?

How are we going to teach the revised curriculum?

Challenge: The academic culture encourages disciplinary silos and focus on research

How can educational
development be encouraged?

Some premises

Education is our most important interface to society

Our government is very concerned about education — the foundation for future development

Good education is the basis for good research — it attracts good students

Much better to be on the offensive than passively be ordered about by NOKUT or the Ministry of Education!

What's the real problem?

Retention — drop-out rates?

No podcasts?

Not on Facebook?

No MOOCs?

No digital assessments?

Old fashioned lectures?

To little follow-up?

No systematic improvement?

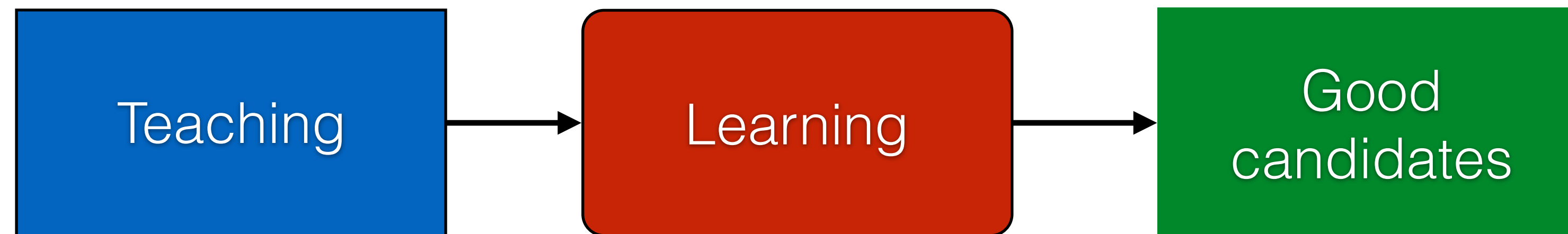
Too much teaching?

Is the curriculum up to date?

What about the use of IT?

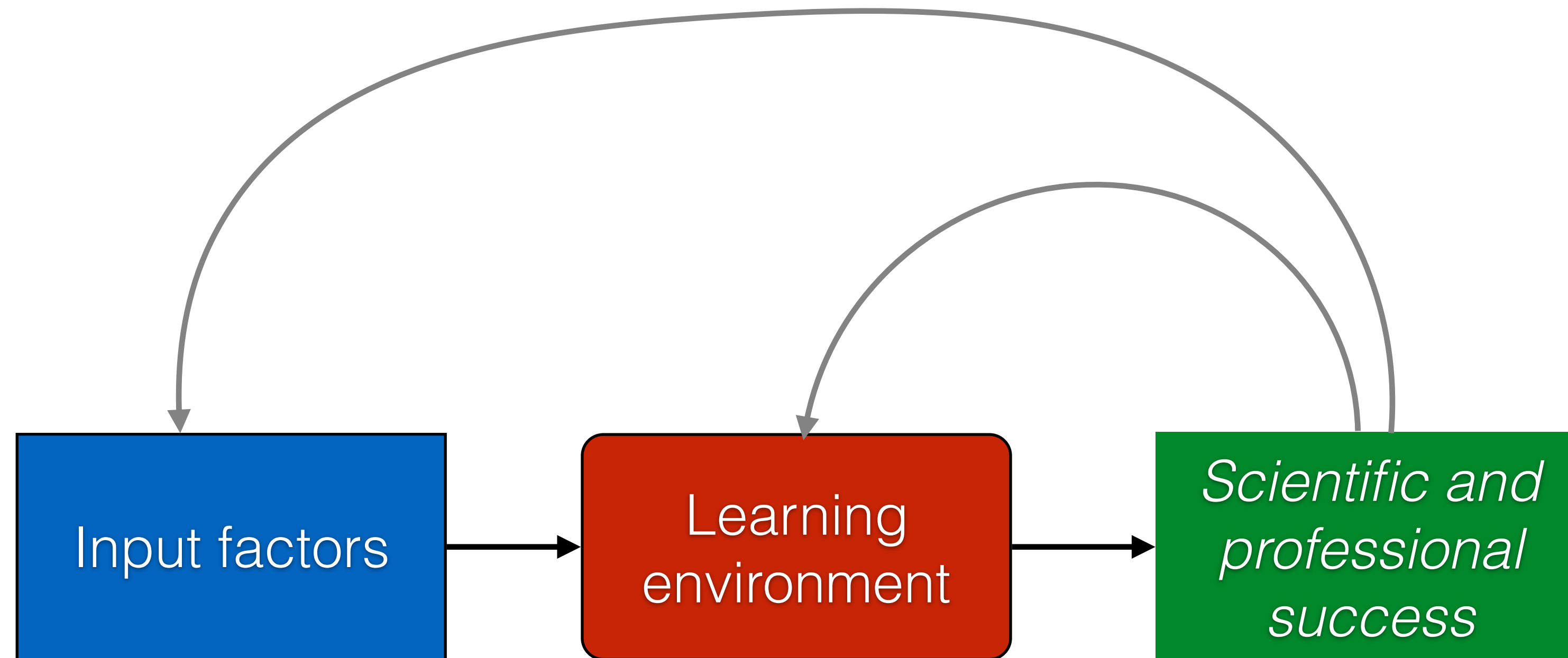
And the learning environment?

How do we think about education?



The details make up a somewhat arbitrary totality

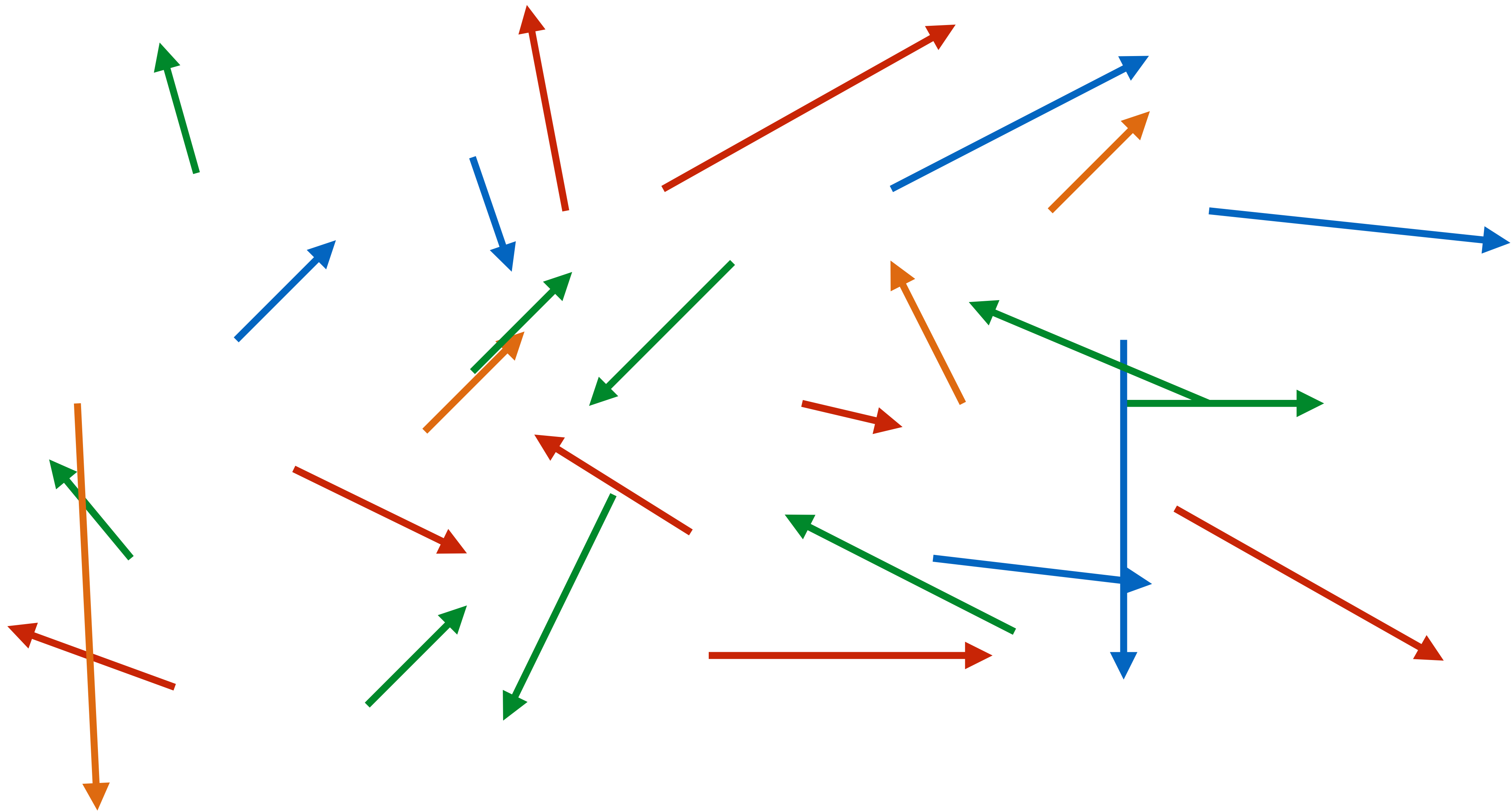
What is the alternative?



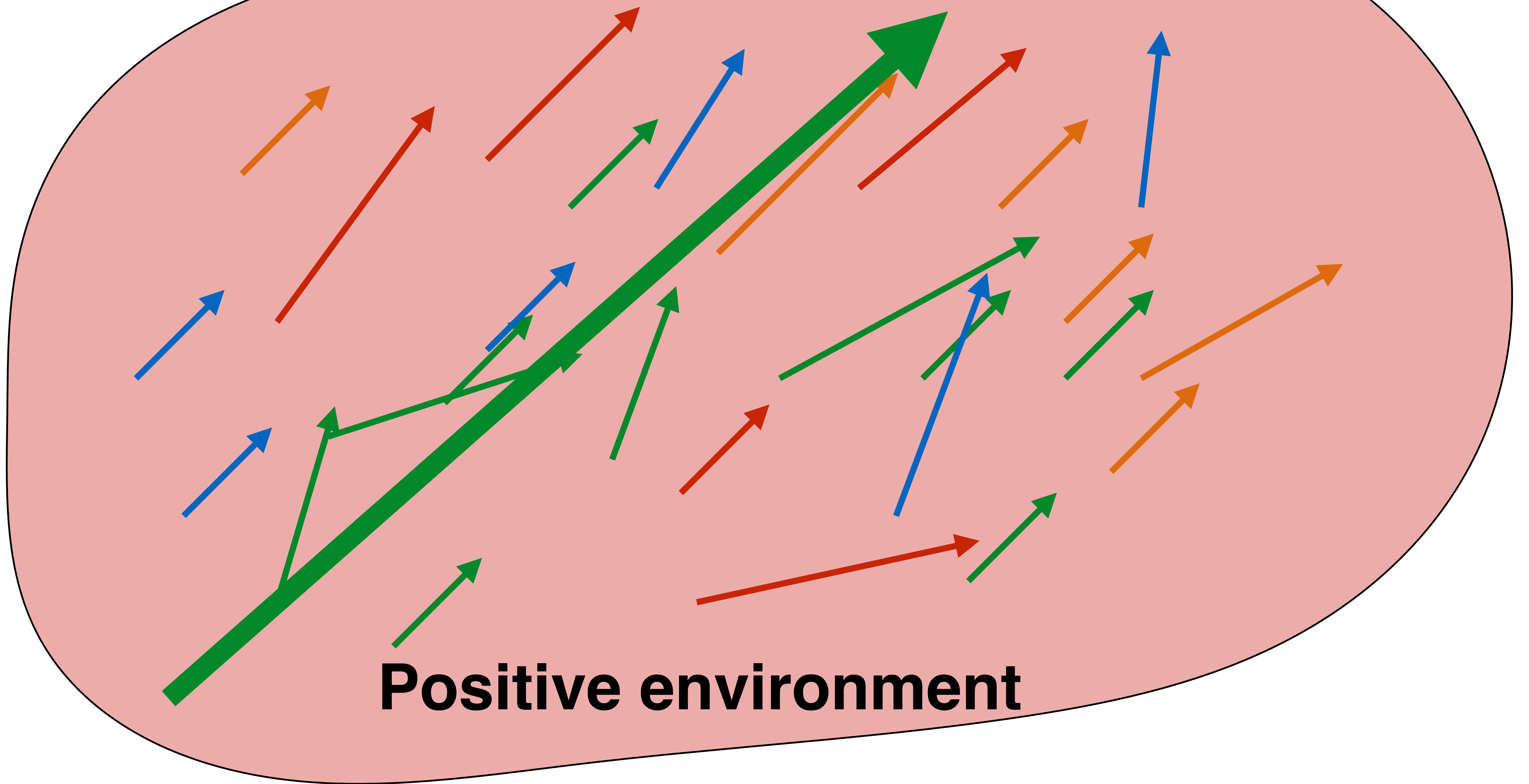
A desired ambition provides direction for the details!
Requires collaboration!

What is a mathematician?

*What is a mathematician going
to be?*



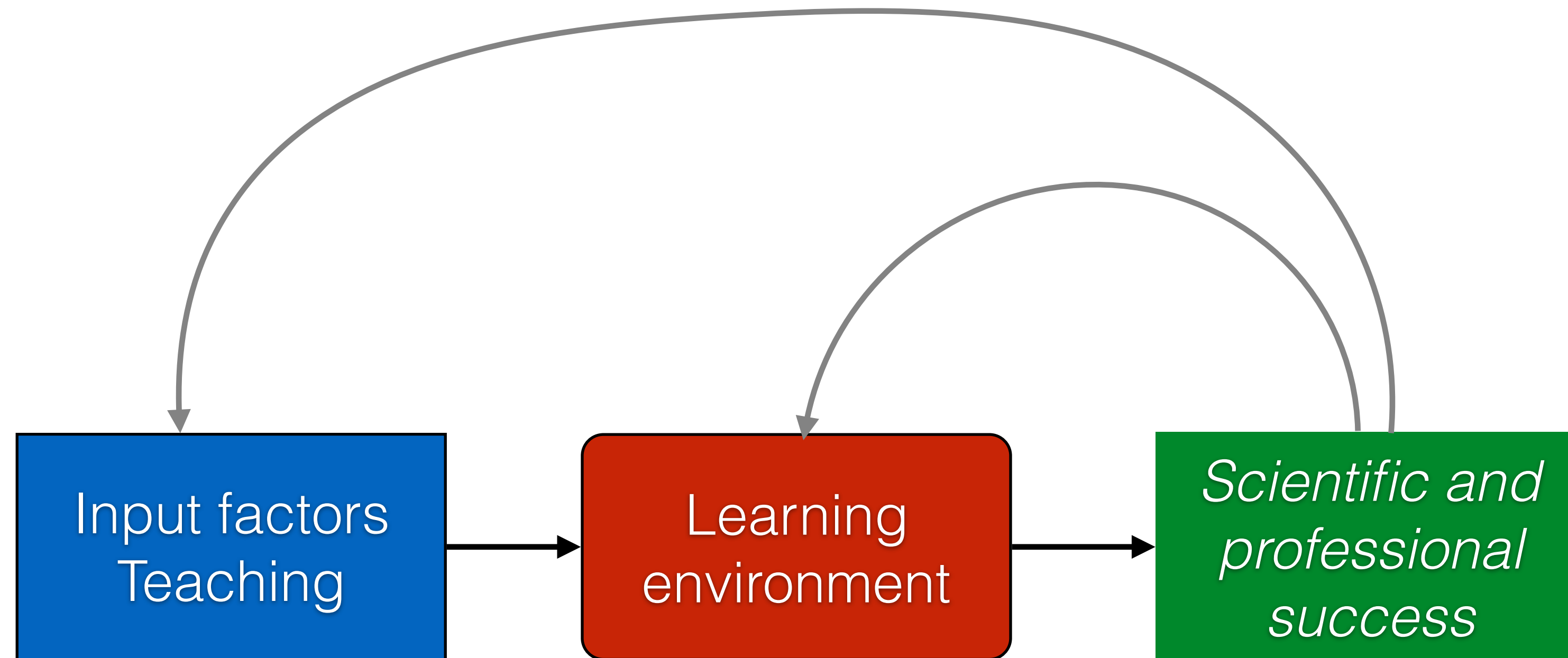
Attractive, common ambition



Positive environment

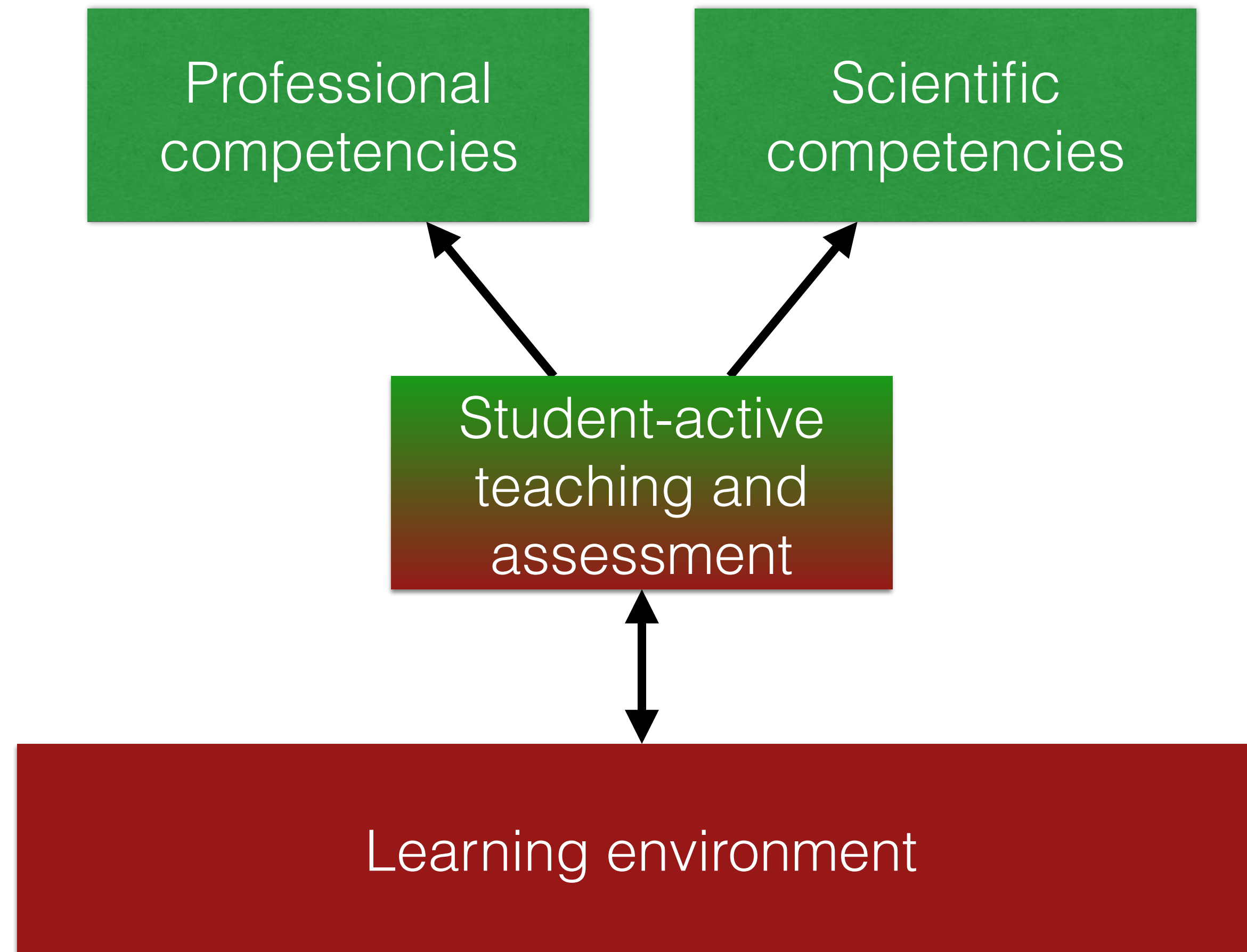
[https://www.youtube.com/
watch?v=bYvbaqfq9ml](https://www.youtube.com/watch?v=bYvbaqfq9ml)

What is the alternative?



A desired ambition provides direction for the details!
Requires collaboration!

Relation between different elements of education



Discussion

What characterised the learning environment when you were an undergraduate student? (Competitive, including, lonely, ...)

Give some characteristics of your ideal learning environment

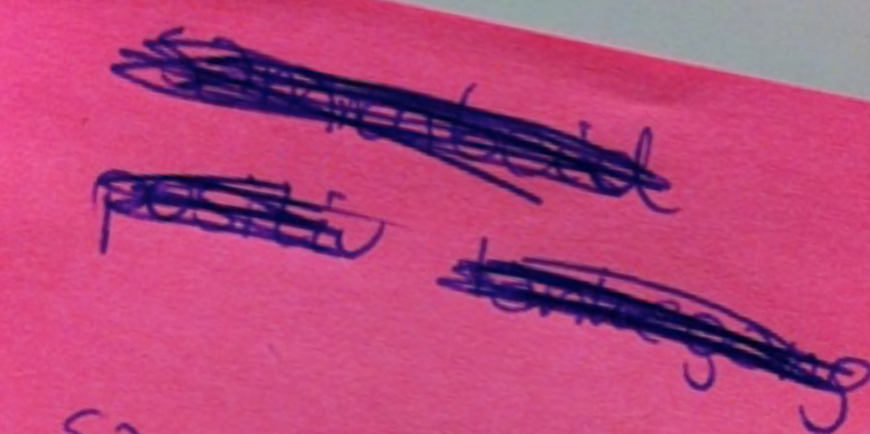
Learning environment
What do the students say they
need?

God læringskultur:

1. Samhold
(Motiverende)



Inkludere
og ekskludere
medstudenter



Samarbeid

God læringskultur:

1. Samhold

What do the students say?

1. I need someone to text me when I don't show up on campus
2. The others are so much better than me

OTHERS ARE MORE CAPABLE

I think that

Margot Gerritsen

Professor matematikk

Stanford University

*220 respondents in
engineering mathematics*

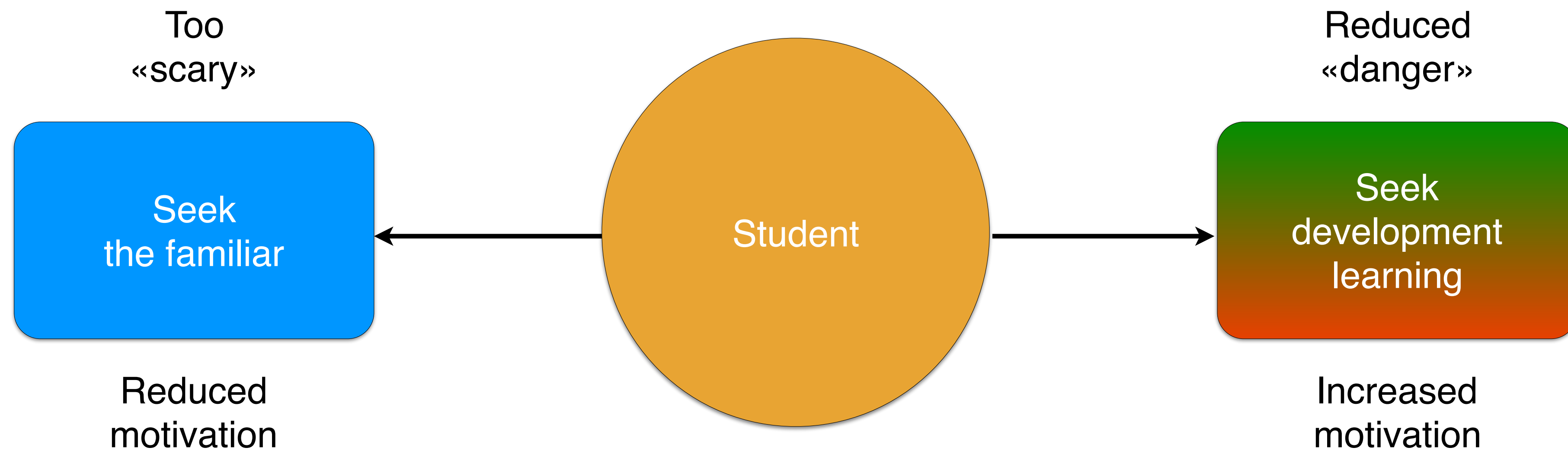
often/always

- 50% male, 71% female

never/rarely

- 22% male, 6% female

Positive learning environment?



In practice

First day: 4.5 hrs

- Social belonging, scientific inspiration, personal development, what are your expectations?

Program seminar: Two days at a hotel

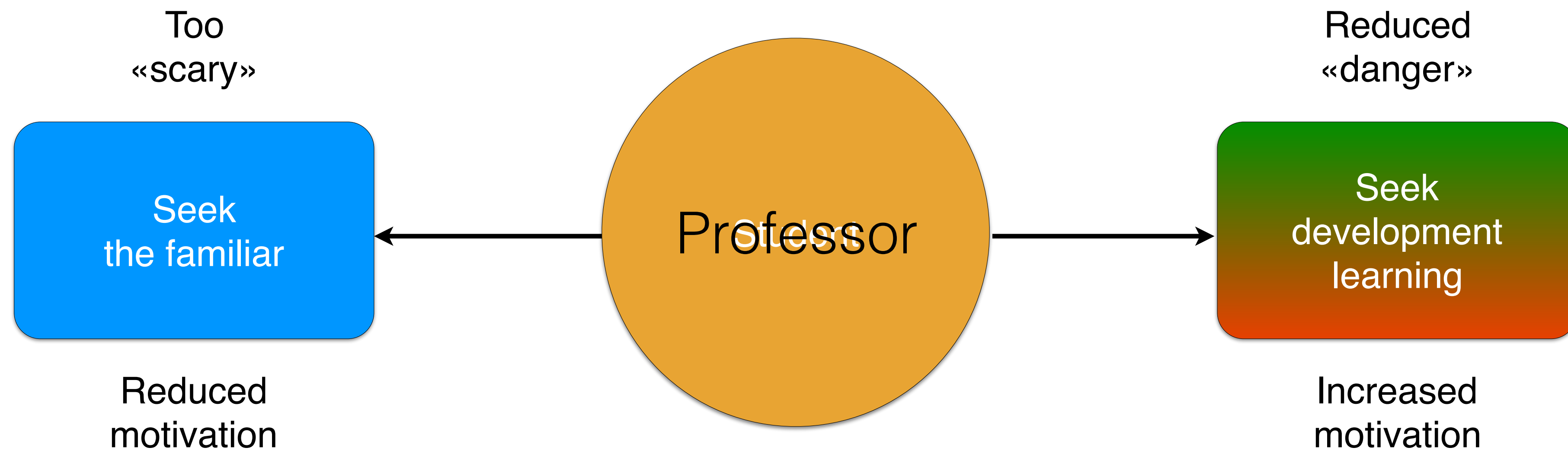
- Alcohol free, same content as first day, what do you need to succeed?

ForVei: How are you doing?

Met, Seen, Heard, Respected, Loved (MSHRL)

Culture for learning

Culture for learning



Thank you!