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Teaching Physics in a Foreign Language: Challenges and Opportunities

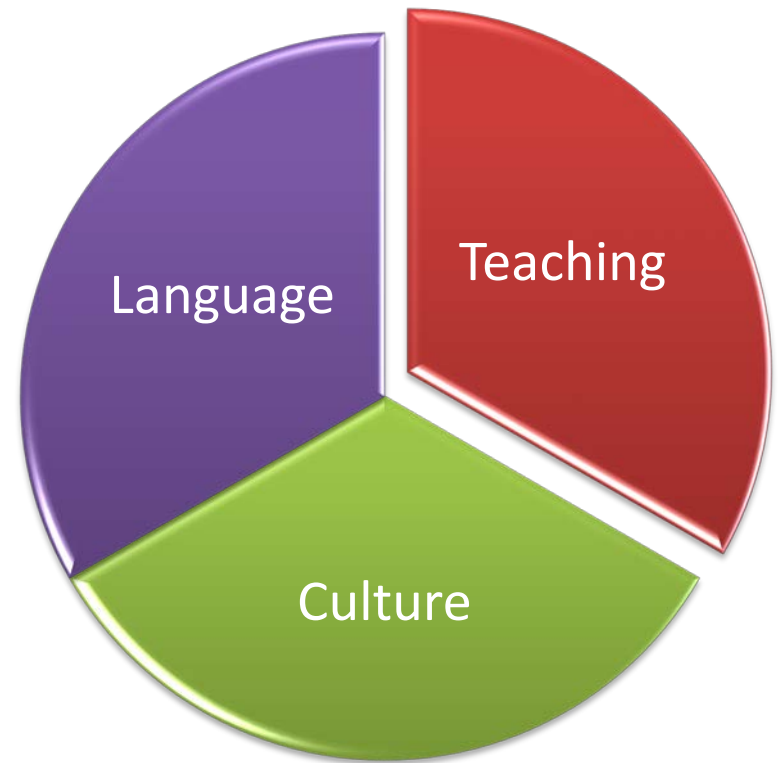
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Language and Culture

**“Those who know nothing
of foreign languages know
nothing of their own.”**

—Johann Wolfgang von
Goethe



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UBC (University of British Columbia)



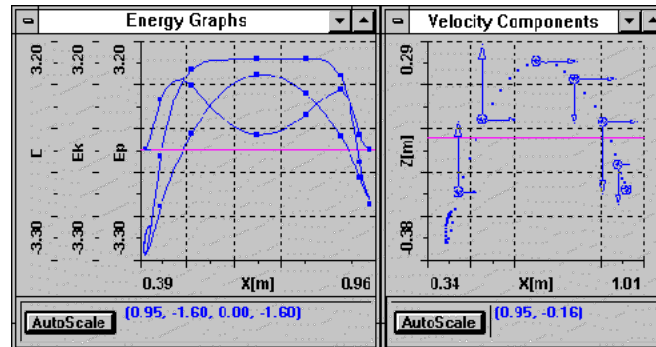
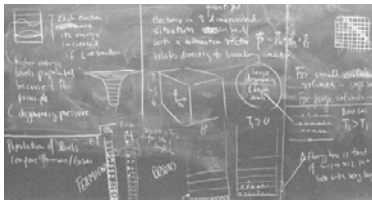
**13,189 international students
from 139 countries!**

UBC Facts:

- Public university
- Established: 1908
- 2 campuses: Vancouver & Kelowna
- ~61,000 students
- Academic staff: 5334+
- Acceptance rate: 64%
- International ranking – 34th (U.S. News and World Report 2016)

1

My Physics Education Trajectory



New tools



New everything

My Physics Teaching Language Trajectory



T: Russian – Hebrew – English

S: Russian – Hebrew+ – English++

2

My Inspiration



Korina Polinger, Israel



Eugenia Etkina, Rutgers University

These world-class
physics educators
teach in a non-
native language...

3

Science Teaching ... and Language



“Mathematics is the language in which God has written the universe”

— Galileo Galilei

Is English the language of Science? Is it Russian? Is it German? Why does it even matter? **How do we teach in a foreign language?**

4

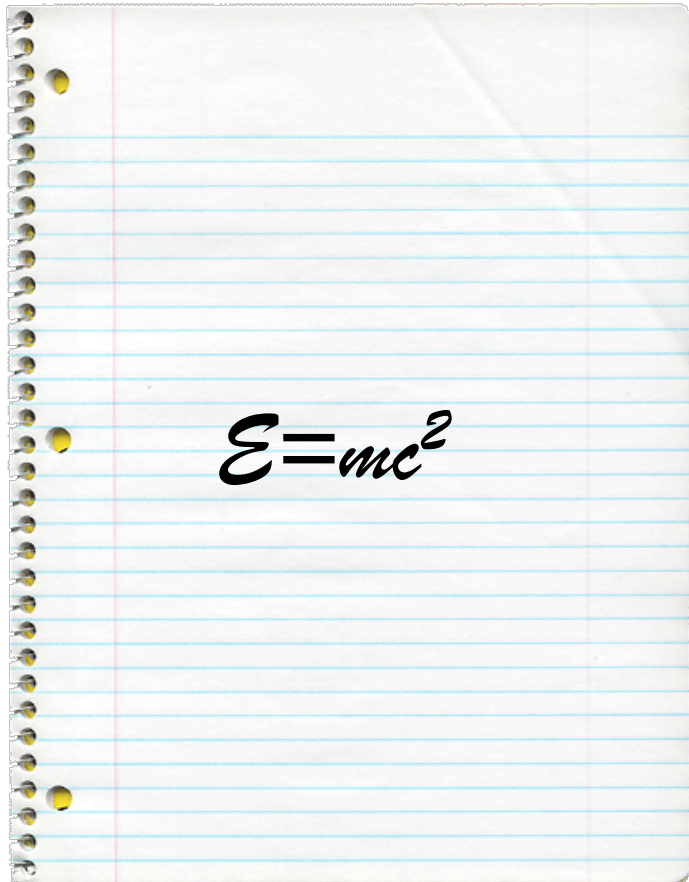
Teaching Physics in a Foreign Language



Teaching Physics in a Foreign Language - Challenges

- Lack of confidence: not a native speaker
- Communication challenges
- Different educational/classroom culture
- Different student & parents expectations

Challenges – Not a Native Speaker



Challenges – Communication



University of Texas, Austin

Challenges – Classroom Culture



Challenges – Expectations



Teaching Physics in a Foreign Language



Teaching Physics in a Foreign Language - Opportunities

- Lack of confidence: not a native speaker
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Opportunities – Not a Native Speaker

Knowing foreign languages helps when teaching physics. It stops you from taking the language of physics for granted!



Speed and velocity

Opportunities – You are a Foreign Language Learner

The key to teaching anything is to remember what it was like not to understand that thing. That's a very hard thing to do. Every time you come to understand something you didn't understand before, you are transformed. You become a different person from who you were before. The key to teaching someone else to understand that same thing is to remember your former, untransformed self. If you can do that, I think you can teach anything, even physics.

Opportunities – You are a Foreign Language Learner



Opportunities – Communication



By teaching in a foreign language you naturally slow down and pay attention to the language of physics

By teaching in a foreign language you bring your knowledge and traditions about physics learning



Opportunities – Different Educational Culture



- What are expectations of students?
- Assessment of students?
- What is the role of parents?
- What is available at school?

- What are expectations of teachers?
- Assessment of teachers?
- What is the role of parents?
- What is available for Pro-D?



Opportunities – Different Educational Culture

- Your and parents' views on science and science learning depend on the culture
- You can bring a different perspective
- Your background can help you connect with the students and parents

Opportunities – Different Educational Cultures



Coming from a different culture forces you to challenge the “normal”:

Who learns physics?

Who teaches physics?

Who are physicists?

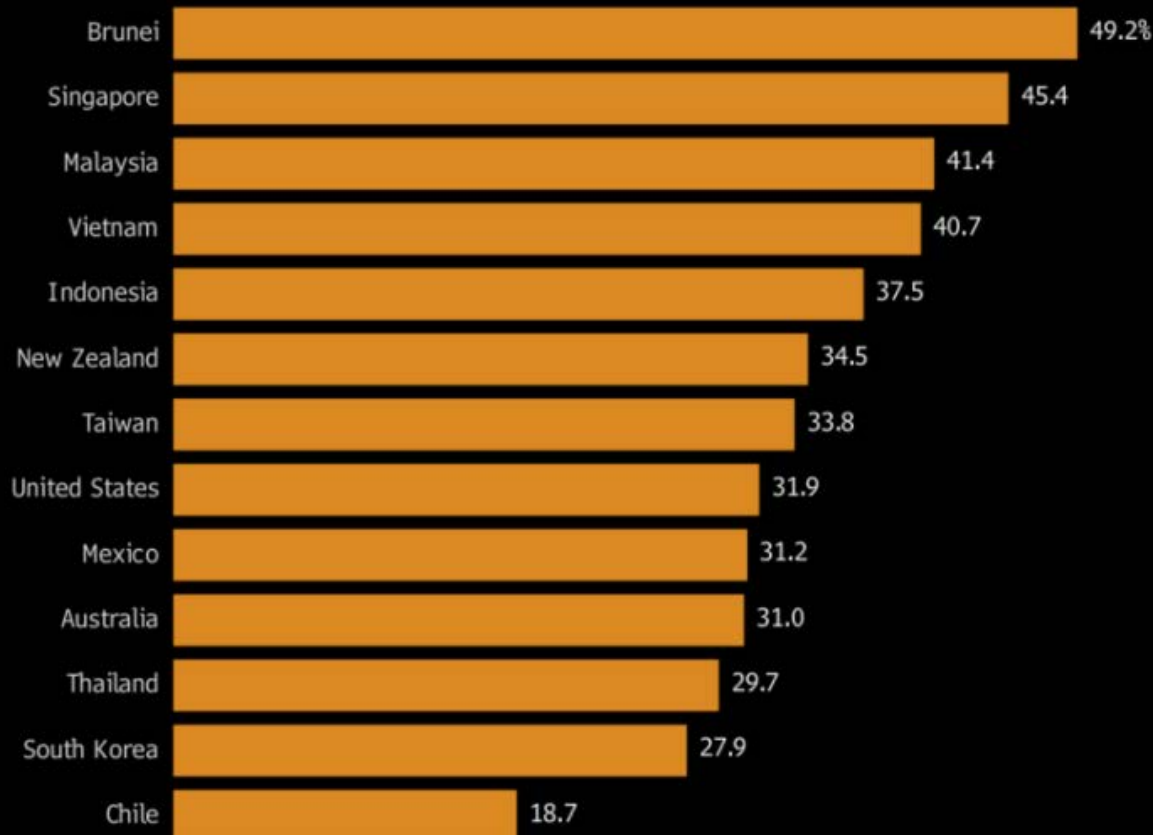
According to Unesco, 29% of people in scientific research worldwide are women, compared with 41% in Russia. In the UK, about 4% of inventors are women, whereas the figure is 15% in Russia.

Opportunities – Different Educational Cultures

Women in Math

Brunei leads APEC economies in female graduates of STEM disciplines

■ Share of tertiary graduates of science, technology, engineering and math who are women



Women in Math

Brunei leads APEC economies in female graduates of STEM disciplines!

49.2% of graduates in Brunei are females.

In the US – 31.9%

Opportunities – Different Educational Cultures

Different views of physics teacher Pro-D



Summary

“A different language is a different vision of life.”

—Federico Fellini

